
Depth To Be Decided

8.0 Organisation and Staffing

Participation within this Reuse Technologies framework will provide Municipalities with an opportunity to commoditize their waste in novel ways that will benefit both the taxpayer (struggling communities) and the local economy. The waste-to-energy technologies have enormous potential to provide locally produced electricity and fuel, plus landfill reduction options, skills transfer and - jobs. All of this takes place while reducing the dependence on current capital-intensive energy production technologies.

In a country like South Africa where circa 14% of households do not have access to electricity and where education and employment figures are dwindling year on year, it is essential to develop new and innovative ways to turn this around.

The focus region of the Central Karoo involves a majority of under-served communities in wholly under-serviced areas in the Western Cape and the process facilities will be the novel way to change what were once Liabilities to Assets.

Labour Force- Leeu Gamka Process Facility

Reuse Technologies SA will build a new Plant Located in Leeu Gamka close to the Landfill site with the intention being to rehabilitate the existing Landfill site.

A Materials Recovery Facility (MRF) will be set up where the MSW is currently being dumped and hand sorted. (Phase 1) This operation will use a labour force

of roughly 250 people with additional equipment for Health & Safety measures to be put in place.

The separated Organic material will be transported to an agreed location within Phase 2 ready for use within the new Plant for Power/Liquefied Biomethane. The Plastics will also be set aside for conversion to Diesel oil. The remainder Non Organics (cans/metals/glass etc) will be sold as normal (recyclables).

A total of 500 people will be operational in the Phase 1 and Phase 2 recycling areas. This process will be followed until such time as enough awareness is raised to educate communities about the importance of recycling waste at the source so that it does not reach the dump site.

Entrance Phase 1 - Materials Recovery Facility (MRF)

The existing entrance of the landfill site will be used for the labour and transport required to regenerate the existing Landfill material for use within the new Plant (Phase 1 MRF) using roughly 250 people- waste pickers for sorting/separation .

Those waste pickers already living at the landfill site will be housed within New Refurbished Welfare Facilities to be built Opposite the Entrance of the landfill site.

Entrance Phase 2 - Materials Recovery Facility (MRF)

The new access is proposed to be used only for new MSW delivered weighed and accepted through the new Gatehouse/weighbridge/Office. This will be sorted at Phase 2 MRF Site using a minimum of 250 new people for sorting/separation as Phase 1.

The recycled goods will be sorted in this new area. The 250 new people will be housed within New Refurbished Welfare Facilities to be built Opposite the Entrance.

Phase 2 will be made into a modern Waste to Energy park housing the Proposed New Process Facility.

Housing upgrades for waste pickers

We propose housing upgrades for the waste pickers already located at the entrance to the landfill site. This will not only assist in restoring the dignity of these waste pickers but address the very important safety and health issues that they are subjected to by living close to a landfill site.

The current waste pickers will be integrated into the workforce and play a vital role in this process as they have prior knowledge of waste sorting/separation. Further training will be provided to the 500 indirect workers who will be employed at the landfill site.

The work force at the landfill sites at landfill sites in other Central Karoo Towns will be addressed during the feasibility process wherein a more detailed study

would need to be carried out, but the intention is to use local labour from the region except where such expertise is not available locally.

The proposed Process Facility (Phase 2 Development Site as indicated previously will be modular in design, and will comprise a series of equally-sized parallel streams, each being run independently of each other.

Individual projects will be built by South African Companies with local Plant, Machinery and Materials – with a limited need to import.

As a private company providing energy solutions to the Central Karoo District, we will use appropriate recruitment and staffing practices in partnership with the Municipality partner.

We apply a range of tactics including local recruitment and immersion experiences to build understanding of local needs and opportunities.

It is critical to the 'social license' that we receive from local communities that they are co-creators and partners to the Reuse Technologies SA Partnership with the Prince Albert Municipality, building processes, adoption and revenue building of this facility.

Key people in the target communities will be recruited to provide the following:

- tested business approaches for working in the focus area;
- complementary resources and skills;
- information about the community's needs, goals and feelings;
- brand ambassadorship; and
- staffing as Waste Picker Supervisors, managers, builders, Training staff and maintenance technicians etc

It is certain that the most effective and knowledgeable partners will come from the community itself and this is key to our approach to the implementations in the local communities. This may include municipal leaders, community leaders and/or entrepreneurial local middlemen. Reuse Technologies SA as the project owner will employ staff from the local communities. The staffing, managed by Reuse Technologies SA in conjunction with relevant team from the Prince Albert Municipality, in each local community consists of:

- Reuse Technologies SA Directors
- Board of Directors,
- Mayor, MM, CFO

- Various Account, Safety and Operations Managers ;
- Various Support and Maintenance Managers.

9.0 Training and Development

Waste is a catalyst for economic growth and development and as such the partnership between Reuse Technologies SA and the Prince Albert Municipality will form the basis of a changing vision for the future of the Karoo.

The Leeu Gamka will house the regional landfill site in the Central Karoo District and will be used as a Center of Excellence to train all the people needed for new Facilities across South Africa. We are planning an ongoing program for each Demonstration Site. Courses would be aimed at addressing skill shortages and providing sustainable employment.

One of the goals of Reuse Technologies SA is to identify, lead and empower new South African waste Engineers and entrepreneurs by utilising various in-house training programmes. By identifying, recruiting and working with individuals who have a passion for Engineering and business, we create the opportunity for employment and ultimately ownership. We equip local entrepreneurs with a sustainable and shared ownership business model. They will be empowered through on the job training, coaching and mentoring through the Co-operatives. On-going training, transfer of knowledge and expertise will be provided to equip our South African Engineers to grow and be in a position to operate the Plant.

9.1 Training for those candidates qualifying for further study

Reuse Technologies SA plans to set up Education Centers in each facility location for Training and for Research & Development. This will be an ongoing program and will be applied to every Demonstration Site. The company will be organizing a separate dedicated budget for this activity.

The company is planning to organize general job training for all aspects of its modular waste treatment facilities. In addition, the Education Centers will provide Professional Renewable Energy Courses, for example:

Postgraduate Certificate in Energy & Fuels from Waste.

Most of the proposed courses will be developed in partnership with local Education Institutions and Universities. The company is aiming to address the skill shortages that can be identified in this rapidly evolving business sector. The educational courses will cover a broad curriculum that will include the following areas:

- *Financial*
- *Technical*
- *Operational*
- *Environmental*

- *Regulatory*

The company is proposing initially to have formal accreditation in the following four Modules:

Module 1:

- Feedstocks and Technologies for Energy & Fuel Generation

Module 2:

- Management of Energy & Fuel Generation Project

Module 3:

- Environmental Management of Waste Derived Energy Generation

Module 4:

- Operation and Maintenance of Energy & Fuel Generation Plant

9.2 Training for those candidates with little to no formal education

Employment of Waste Pickers and other waste personnel may start with learnership and casual contracts and develop into permanent contracts based on performance and competence.

This project provides an opportunity to turn waste streams into much needed revenue streams with a market transformation model that will provide reduced landfill use, address poverty in the region through job creation and CSI partnerships with Corporates, and change how municipal waste is viewed and handled in the future. The technology together with a sound community driven plan is a combination that will drive this project to tremendous heights for the Karoo.

We believe that there is no need for any organic waste to be sent to landfill as it should be providing opportunities for economic growth and development.

Candidates for these positions will regular receive skills and other job related training:

9.2.1 Soft skills training

These are personal skills, and will educate candidates on management of his work and interpersonal skills and will not be concerned with knowledge candidates may or may not hold but will be more focused on the behavior and other patterns that may be exhibited. Soft skills are intangible and are challenging to quantify.

- Leadership skills
- Communication
- Problem solving

- Emotional intelligence
- Adaptability

9.2.2 Job related training

Tax/Financial planning	Job related training
· Budget · Contract · UIF	· Recycling · Waste · Landfill process to Reuse

9.2.3 Other job related training

- What is recycling
- Recycling process flow
- Waste generation (Residential/Commercial/industry.
- Waste accumulation, storage, collection
- Transport to recycling plant
- Processing/MRF
- Transport to landfill
- MRF to Reuse Technologies
- Tax/Financial planning (Banking institution to provide training of amongst other; use of an ATM, Choosing a PIN code, Bank cards etc
- Medical Plan (to be conducted by someone in the insurance industry)

- Burial cover (to be conducted by someone in the insurance industry).

10.0 Recommendation

That the Municipality Council authorises the partnership with Reuse Technologies SA to proceed with the Waste-to-Energy process facility in Leeu Gamka and to start implementing their feasibility and carbon credit study in the Central Karoo District in order to do so, approves the required Resolution therefore.

REUSE TECHNOLOGIES SA
(PTY) LTD

'Waste to Opportunity'

South Africa Office:
Cape Town
Diep River, 7945
Office: +27 21 712 0291

Ref: RTSA20/
PA1

Prince Albert Municipality

Attention:The Honourable Executive Mayor: Mr Lottering

and

The Municipal Manager: Ms Anneleen Vorster:

and

The Chief Financial Officer

3 November 2020

Dear Sir / Madam

Re: Reuse Technologies SA Waste to Energy Process Plant in Leeu-Gamka

We refer to the above matter and thank you for your time in receiving this submission which we trust may be used as the base for an Item to be submitted to the Mayoral Committee and/or Municipal Council.

As a company specializing in waste treatment solutions, we at Reuse Technologies SA are confident that we can provide a viable solution to deal with the challenges relating to waste management and unemployment.

We can confirm that our Process solutions diverts any and all Biomass fraction from Landfill, converting it to Bio-fuels and other usable products. We can diversify energy production, while at the same time decrease landfill use, and increase revenue and employment.

Our projects will be led by accomplished and experienced engineers ready to transfer skills and knowledge in waste management to local Engineers. This will create a ***market transformation model*** that will change how municipal waste is viewed and handled for the foreseeable future to allow "green" Renewable Energy to find its rightful place in the Municipality's economy.

In addition, Government has recently gazetted changes that will now allow municipalities to generate their own power while dispensation will be issued to allow all Municipalities in the country to purchase their power from sources other than Eskom.

Whilst we have always known that our holistic approach to waste to energy through the combined technology and business model of community inclusion would be the solution to economic growth and environmental health, it now makes it a lot easier for interested Municipalities to take Council Resolutions needed for the Reuse Technologies SA project to be implemented.

Reuse Technologies SA stands ready with an investor to fund a R450 Million Waste to Energy Process Facility in Leeu Gamka on conclusion of a Feasibility and Carbon Credits study.

We have prepared a proposal which we believe will allow the Prince Albert Municipality to contribute to the writing and implementation of a superior Waste to Energy plan for the region as our process facilities can be adapted to different Waste-to-Energy problems, and offer a range of Metro Solutions for the Environment. This plan will allow for the implementation of "green" or Renewable Energy ("RE"), introduce energy efficiency, and the implementation of Carbon Credit programs, whilst at the same time addressing issues with water.

Our Approach

Reuse Technologies SA envisions a Partnership approach that takes our market-ready technologies and develops a self-sustaining plant in Leeu Gamka and in turn, produces a return on investment and lowers the costs associated with managing municipal solid waste (MSW). The process facility will quantify a city's MSW and turn it into revenue. Currently towns experience the financial burdens of sustaining a multi-stream recycling and solid waste program. In many cases recycling programs COST municipalities money - long after institutional subsidies are no longer available. Our approach could turn municipal waste to energy at the transfer station, thus drastically reducing transportation costs, tipping fees, and the need to pay for landfills

OUR Technology

Improved energy yield and profitability of traditional anaerobic digester system
The project makes use of integrated technologies in the conversion process and is approved by the European Union, is 100% compliant with the terms of the Kyota Protocol and the Paris agreement on climate change signed by South Africa in 2016. All waste will be converted to energy. Our Process is clean and we do not burn or bury (no waste diverted back to landfill). We hugely improve energy yield and profitability of a traditional anaerobic digester system, doubling, even tripling cash flow and profits. The technology is unique and disruptive but not new. We change the landscape for cellulose to energy production.

Technology Background
What sets us apart from the rest?

Intellectual Property where the Anaerobic Digestion-Reaction is speeded up from 20/30 days to 2 days or less which enables all the Biomass to be converted.
A commercial cellulosic sewer sludge processing plant operated in Apeldoorn, Netherlands from 1992 to 2008. The facility used wet oxidation and was the initial project from which the Reuse Intellectual property (IP) was developed. Our Engineers and company Advisors were a large part of the Apeldoorn hydrolysis / wet oxidation process where tremendous success was achieved in the processing of sludge waste in an environmentally safe manner. It is vital to note that every Anaerobic Digester (AD) Plant (of which there are hundreds), have the same process of breaking down Biomass to produce Methane/Carbon Dioxide/by-products.

However the IP we have is inserted at the front end to break down the Lignin bond and release the Cellulose so that the Reaction is speeded up from 20/30 days to 2 days or less which enables all the Biomass to be converted to more Methane/Carbon dioxide/By-Products but leaving no Residue/Digestate unlike other Anaerobic Digestion Plants. This is a basic Hydrolysis programme which pre-treats Biomass (Ligno-Cellulose) and breaks it down into its component parts Lignin C6-Saccarides (the Cellulose) and C5-Saccharides (the Hemi-Cellulose) components all covered by IP which other AD Plants do not do.

Benefits of Technology

- Reduced carbon footprint
- Reduced landfill use creating more space for Housing, Parks with potential to divert 100% of waste going into landfill.
- Modular design structure so can be easily adapted to different requirements
- No harmful emissions - no smoke, no chimney stacks, no odours, NO INCINERATION (no burning), no release to the air or ground of toxic emissions or particulates (no greenhouse gases and land contamination)
- **Biomass from waste water sludge treatment plants can be used in the process**
- Innovative Intellectual Property

Benefits for Local Municipality and Communities

- Economic Growth in the region and New Revenue stream with faster return on investment and lower costs associated with managing municipal solid waste.
- Addresses electricity and/or other energy shortages.
- Project is Carbon neutral so able to attract carbon credits for social development of communities.
- Training for skilled and unskilled workers aimed at addressing skill shortages.
- Up to 1000 direct and indirect jobs, depending on the size of the plant. The plant will operate 24/7 and work 3 shifts/day.
- Poverty alleviation. Liberty, Metropolitan, Banks and Medi-Help have agreed to partner in quarterly Social investment initiatives (food parcels, dignity packs) in the region.
- In line with plan for National organic waste diversion plan for Municipalities

Projected project Impacts of Facility.

The projected impacts of our demonstration research include the ability to process through each Facility:

- 230,000 - 400,000 dry tons of municipal solid waste per year.
- Outputs of the most valuable biofuel (LBM) at rates of 40,000 - 70,000 tons.
- Generation of 5 MW - 7.5 MW of electricity.
- Diversion of 100% of waste going into landfills.

Seeing waste as a catalyst for economic growth and development

This project provides an opportunity to turn waste streams into much needed revenue streams with a market transformation model that will provide reduced landfill use, address poverty in the region through job creation and CSI partnerships with Corporates, and change how municipal waste is viewed and handled in the future. The technology together with a sound community driven plan is a combination that will drive this project to tremendous heights for the Prince Albert Municipality and indeed the entire Central Karoo District.

On-going training and transfer of knowledge and expertise will be provided to equip our South African Engineers to grow and be in a position to operate the Plant. We believe that there is no need for any organic waste to be sent to landfill as it should be providing opportunities for economic growth and development.

Our Solutions for Inorganic & Inert Materials derived from:
Plastics/Landfill leachate/Hydrocarbon Waste

TYPICAL ORGANIC WASTE INPUT -

- *Crop processing*
- *Landscape debris*
- *Scrap wood*
- *Feed lot manure*
- *Agriculture waste*
- *Pharmaceutical waste*
- *Sewer screenings etc.*
- *Food waste*
- *Paper waste*
- *Hospital waste*
- *MSW etc.*

PLANT CONVERSION PROCESS -

REUSE *Conversion Process Plant converts Organic Waste to Saccharides.*

This is achieved by an innovative technology application based on Weak Acid Hydrolysis. The plant process is continuous & economic.

The Company intends to market and sell design/management/licenses of its Facilities at prices ranging from R50million each, depending on the final individual specifications for each individual facility.

TYPICAL GREEN OUTPUT -

- *Methane*
- *Methanol*
- *Ethanol*
- *Propanol*
- *Butanol*
- *Aviation & jet fuels*
- *2,5 DMF*
- *Hydrogen*
- *Electricity*
- *Bio-plastics*
- *Furfural etc.*

Leeu Gamka Landfill Site

Participation within this Reuse Technologies framework will provide Municipalities with an opportunity to commoditize their waste in novel ways that will benefit both the taxpayer (struggling communities) and the local economy. Our waste-to-energy technologies have enormous potential to provide locally produced electricity and fuel, plus landfill reduction options, skills transfer and - jobs. All of this takes place while reducing the dependence on current capital-intensive energy production technologies.

Our proprietary methodologies include tried and proven technology evolved for the 21st century and beyond. Our specialist solutions and know-how provide an opportunity to integrate current modalities for municipal waste management with a sustainable fuel production infrastructure, and distributed energy production opportunities. This forms the basis for waste-to-revenue processing.

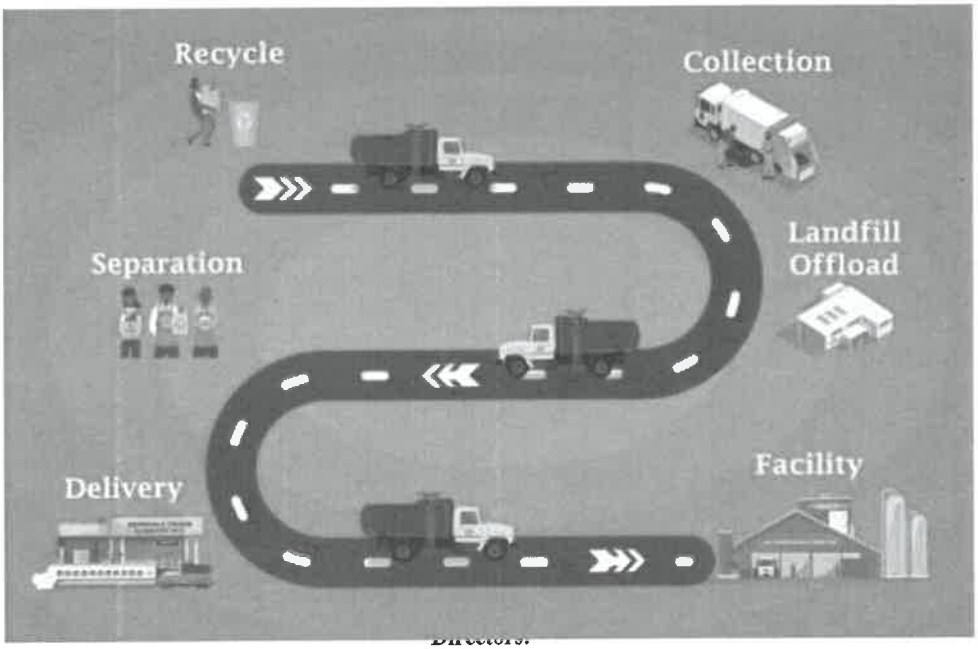
Municipal and private waste management operators, energy sales and distribution companies, and local industries that use and export Liquefied Natural Gas (LNG) products, will all benefit immensely from our technologies.

Waste Pickers

Reuse Technologies SA Proposes to build a new Waste to Energy Process Plant Located in Leeu Gamka.

Phase 1, The intension is to rehabilitate the existing Landfill site commencing with a Materials Recovery Facility (MRF) where the MSW is currently being dumped and hand sorted. This operation will continue using the existing waste pickers as the labour force (roughly 250 people) with additional equipment for Health & Safety measures to be put in place. The separated Organic material will be transported to an agreed location within Phase 2 ready for use within the new Plant for Power/Liquefied Bio-Methane. The Plastics will also be set aside for conversion to Diesel oil. The remainder Non Organics (cans/metals/glass etc) will be sold as normal (recycled).

A total of rough 500 people will be operational in the Phase 1 and Phase 2 recycling areas. This process will be followed until such time as enough awareness is raised to educate communities about the importance of recycling waste at the source so that it does not reach the dump site.



Entrance Phase 1

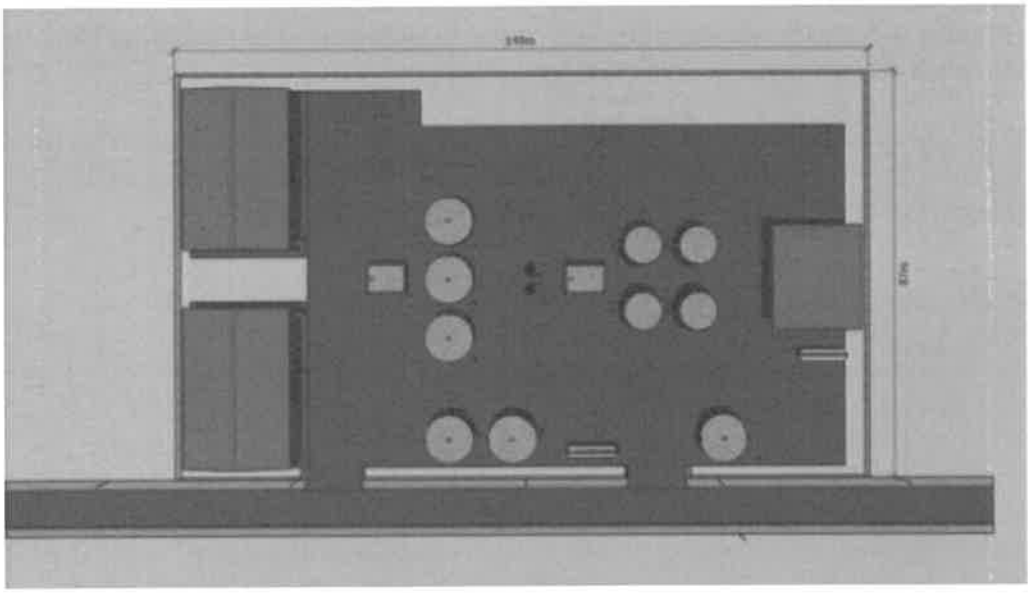
The existing entrance of the landfill will be used for the labour and transport required to regenerate the existing Landfill material for use within the new Plant (Phase 1 MRF) using existing 250 people for sorting/separation. They will be housed within New Refurbished Welfare Facilities to be built Opposite the Entrance of the landfill for existing waste pickers.

Entrance Phase 2

The new access will be used only for new MSW delivered weighed and accepted through the new Gatehouse/weighbridge/Office. This will be sorted at Phase 2 MRF Site using a minimum of 250 new people for sorting/separation as Phase 1. The recycled goods are to be sorted in this new area. The 250 new people will be housed within New Refurbished Welfare Facilities to be built Opposite the Entrance Phase 2 will be made into a modern Waste to Energy park.

We propose housing upgrades for the waste pickers already located at the entrance to the landfill site. This will not only assist in restoring the dignity of these waste pickers but address the very important safety and health issues that they are subjected to by living close to a landfill site.

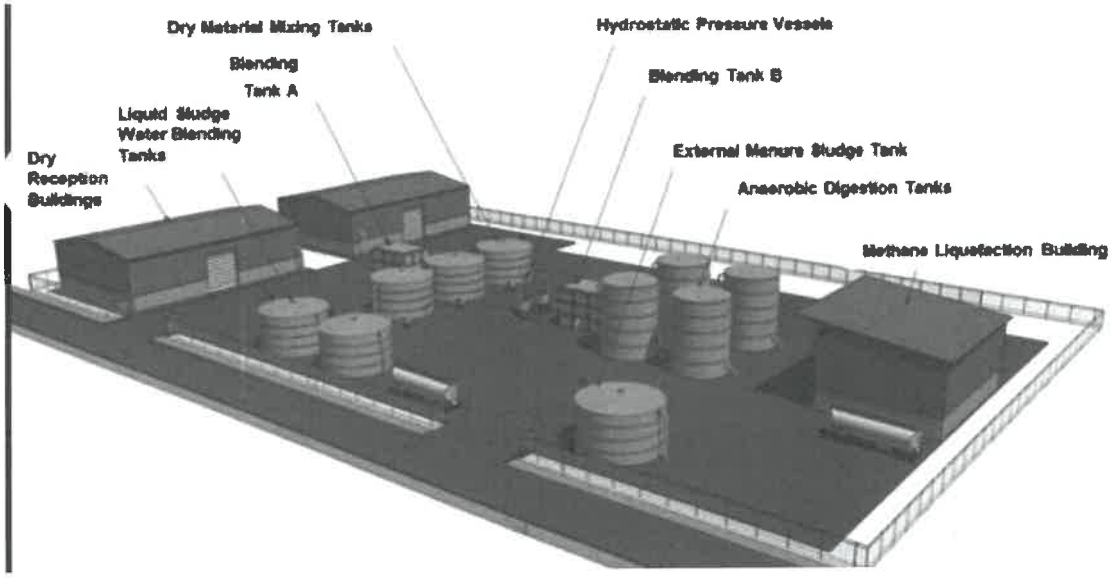
The current waste pickers will be integrated into the work force and play a vital role in this process as they already have knowledge of waste sorting/separation. Further training will be provided to the 500 indirect workers who will be employed at the landfill site. The work force at the other landfill sites in the central Karoo district will be addressed during the feasibility process wherein a more detailed study would need to be carried out, but the intention is to use local labour from the region except where such expertise is not available. **The proposed Process Facility will be modular in design, and will be comprised of a series of equally-sized parallel streams, each being run independently of each other.**



Proposed Plan Drawing of Full Plant Dimensions Leeu Gamka Facility Phase2

Proposed Elevation Drawing of Plant Reuse Phase 2 Leeu Gamka

FOCUS ON LEEU GAMKA PHASE 2



Individual projects will be built by South African Companies with local Plant, Machinery and Materials – with a limited need to import.

A return on investment within 2 years of operation

Water Consumption

In the Facility in Leeu Gamka water that could be utilised from an existing Sewage Works. A continuous flow of water is NOT needed nor does water need to be of a good quality. It is envisaged that storage Tanks needed for the Process that would initially be used to store the water required. The tanks could be built first and storage of the water could be over a 6 month period of non-potable standard (rain/overflow/storm Water/Sewage?). The water would only be needed for the first/maximum two weeks of commissioning until the Plant was self-sufficient in recycling the water that is already within the moisture content of the biomass as previously stated or if Treatment of Sewage water became part of the Design Parameter as a supply.

It is anticipated that any residual water arising from a facility will be discharged into an existing aquifer or used for Irrigation or it could even be treated to potable water standards if that was a necessity.

Training/Safety of Staff

A further approach here is to include a formal system of training of potential staff and operatives to become familiar with the nuances of how such plants work and to include these staff and operatives in a formally recognised course from which qualified personnel will result. Such training courses would follow the equivalents elsewhere and involve the education of personnel to gain quality Technical Qualifications allied with those in Apprenticeships and Technician positions – with the aspiration of even higher grades as the system develops. Training Staff is a key mover here as it would also include Safe Working Practices.

Objectives of the Feasibility and Carbon Credits Study

The report will show the economic, social and environmental impact of the W2E project on the Central Karoo District
The Feasibility and Carbon Credit Study will present in detail, the various investigations, assessments and calculations required towards the establishing of feasible options for the optimum beneficiation of the MSW waste-streams of the Karoo and present the best energy outcome.

The intension of Carbon Credits is to Benefit the Local Economy and that will be clearly defined in the Carbon Credits Study including reviewing the Rail System (Road to Rail Haulage) to cope with the change in emphasis to a central Hub (Leeu Gamka) for the (MSW) Waste Treatment.

In conclusion, the details of a waste management plan will be provided, giving the proposed timing and estimated capital budgetary costs for various phases of the realization of waste diversion and beneficiation within the Central Karoo District. This feasibility study will demonstrate that the proposed diversion of MSW waste streams for beneficiation is technically feasible

Project Implementation Plan

It is anticipated that from Project commencement to facility operation, the development period will last up to two years as stated within Business Plan, approximately as follows:

A new Waste to Energy Process Plant could be a stand-alone Facility. It could also be located near to a Process Input Plant (e.g. Water Recycling plant), or an Output Facility Plant (e.g. Bio-Methane production facility).

The project is planned to be implemented in five phases, in addition to two other phases that will be conducted continuously throughout the duration of the project, as indicated below:

Stage	From Finance
Stage I – Project kick-off and preparatory work • Identification and engagement of relevant stakeholders • Shortlisting of towns best suited for the pilot project	**On Going Leeu Gamka**
Stage III – Construction of the Plant • The plant is constructed on time and within budget (Both MSW and Plastic Plants) • Testing of the plant • Designing of the Railway network • Designing of the Waste Truck modifications to existing Waste Trucks as per the Feasibility Study	**6 – 24M** **18 – 30M** **6 – 24M** **12 – 30M** **ongoing**
Stage IV – Operation of the Plant • The plant is commissioned and operated on a daily basis • Implementation of a programme for the separation of waste at source • Implementation of a MRF at the designated area as stipulated in the Feasibility Study	**24M ongoing** **12 – 30M** **6 – 24M**

Stage V – Full operation of the Plant • Preparation of the Biomass/Organic material • Extracting Saccharides/Breakdown of Cellulose • Conversion of Saccharides into End Products	**18M ongoing** **24M ongoing** **24M ongoing**
Documentation and Distribution Strategy	**Ongoing**
Project Monitoring and Oversight • Establishment and operation of a project management board	**Ongoing**

Company Profile

For your ease of reference, please find attached a Company Profile marked Annexure 'C' which will provide further information about our company, the team members and the products and services that we provide.

In Conclusion

In summary, the proposed Reuse Technology SA Biomass Conversion Facility is able to be adapted to different Municipal needs, be the local volumes of MSW large or small we have the ability to address such through the designs and provides as follows:

The use of saccharides as the intermediate or platform chemical allows Reuse Technologies SA to make a variety of renewable fuels making the output wholly dependent on the processing route.

• Faster turnover times-Technology hugely improves energy yield and profitability of a traditional anaerobic digester system, doubling, even tripling cash flow and profits
. • New Revenue stream with return on investment and greatly lowers costs associated with managing municipal solid waste.
• Addresses electricity and/or other energy shortages- Connection to National grid with off take agreements to be completed with Waste supply and recyclable gas, compost and energy off takers

- Project is Carbon neutral so able to attract carbon credits from the UN in terms of the Kyota Protocol and Paris agreement.

- It is recognised that in any proposal for the Management of and the Collection and Treatment of MSW that the proposals should include retaining the existing "pickers" and "collectors" already indirectly employed and the knowledge of such personnel is often over-looked: it must not be so. An in-depth discussion about how this is to happen will take place with Municipality. The inclusion of Pickers and Collection Staff is essential as they also will be included in the adoption of Safe Working Practices.

- The Biomass conversion facility in Leeu Gamka ill in effect be an extension of the existing MSW management system – effectively a secondary treatment process. The charge here by the Company is to work together with the local area as a unified Team in Partnership to achieve this. By this means the potential exists to use these developments as a springboard for taking these to other municipal areas.

- It is anticipated that from Project commencement to the Plant Facility Operation - The Development Period - will typically last for up to two years, with an approximate break-down as follows:

    - Months 1 - 4 – Feasibility study, engineering & design specifics.
    - Months 5-9 Sourcing & procurement of materials.
    - Months 9 -12 – Construction of plant.
    - Months 12 -15 – Commissioning and Setting to Work

In the general descriptions to date (as previously presented) it has been suggested that the range of designs applicable to the Republic of South Africa can range from an input of around 5,000 to 10,000 tonnes per year of Biomass to any larger number. Where considered reference has been made (Annexure 'B") to Biomass at being 230,000 to 400,000 tonnes per year that reference implied a gross view that would use parallel process streams, and reflect how this would fit into an area. It would need a review on logistics and movement of materials and include the use of local transport systems that will likely use rail systems. It could thus address the potential to have local MRF and then transport the separated Biomass to a common production site or area in Leeu Gamka. The process can include various other forms of Biomass including that from Sewage Sludge and Other Wastes.

The waste economy plays a critical role in making a change in poor and marginalised communities, providing job opportunities, restoring the dignity of human beings, developing skills and will be the ideal platform to raise awareness on climate change.

Please find attached the following for your attention:
Draft Memorandum of Agreement (MOA) – marked Annexure 'A';
Draft Resolution – marked Annexure 'A1';
Draft Item for Council discussion – marked Annexure 'B';
Letter – marked Annexure 'C';
Company Profile – marked Annexture 'D'
Presentation – marked Annexture 'E'
Financials – marked Annexure 'F'
Term Sheet – marked 'G'

We trust that you will find the above information helpful in completing the processes required to fulfil our vision for economic growth of the Karoo.

Should you require any further information or clarification please do not hesitate to contact us.

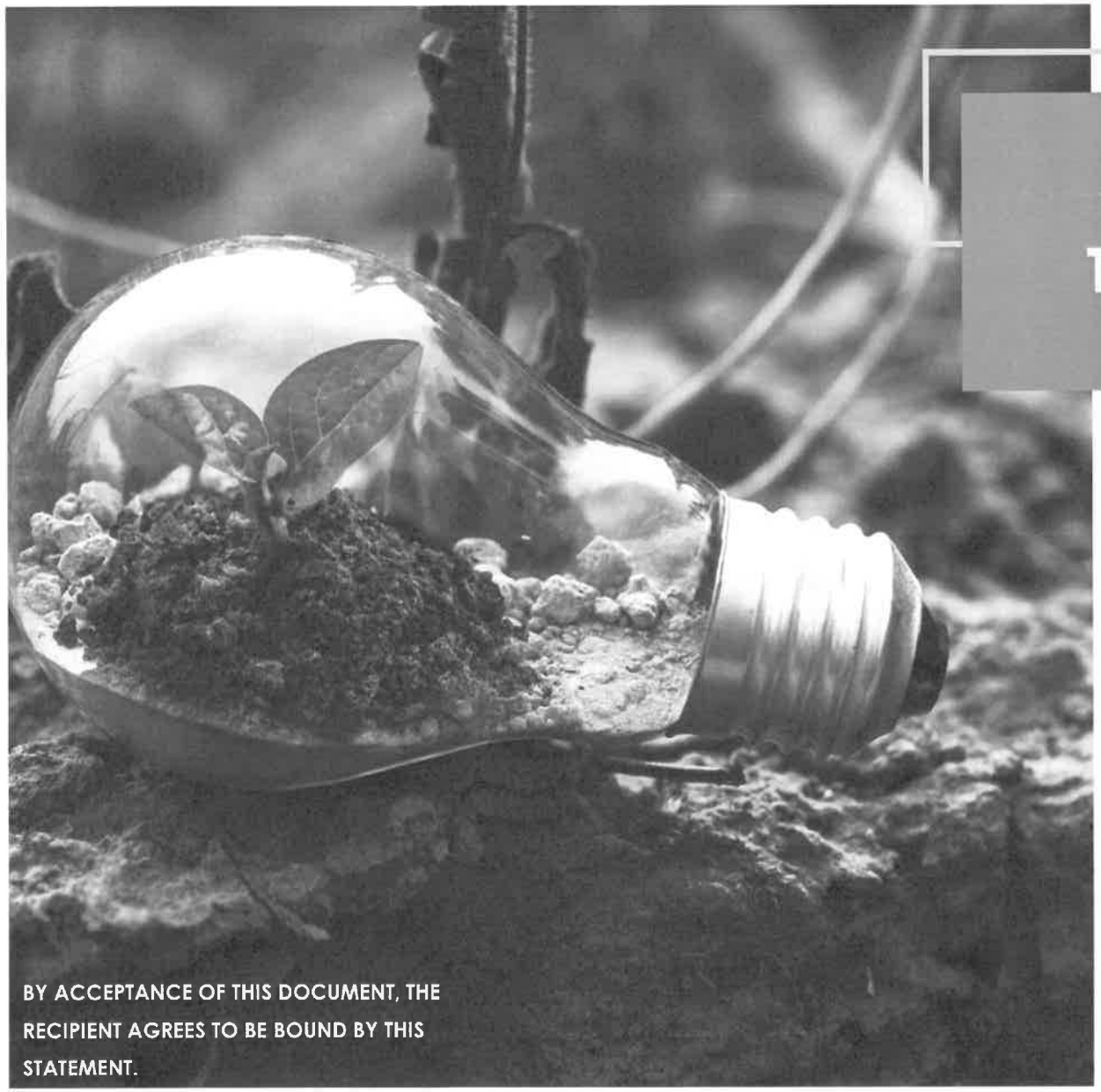
Yours sincerely

Shirly Paulse
CEO Reuse Technologies SA

REUSE TECHNOLOGIES SA

"Waste to Opportunity"

COMPANY PROFILE 2020



BY ACCEPTANCE OF THIS DOCUMENT, THE RECIPIENT AGREES TO BE BOUND BY THIS STATEMENT.

Reuse Technologies SA

This document contains proprietary and confidential information. All data submitted is provided in reliance upon its consent not to use or disclose any information contained herein except in the context of its business dealings with Reuse Technologies SA. The recipient of this document agrees to inform its present and future employees and partners who view or have access to the document's content of its confidential nature.

Reuse Technologies SA retain all title, ownership and intellectual property rights to the material and trademarks contained herein, including all supporting documentation, files, marketing material, and multimedia.

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Company

Reuse Technologies SA is a company focused on solutions for waste & energy problems. We offer innovative solutions to manage organic waste material. In our process there is no release to the air or ground of toxic emissions or particulates.

Our process produces excess water that can be treated and made suitable for reuse as irrigation, or any other appropriate standard.

RECYCLING SYSTEMS

Our solutions eradicate oil-based plastics from the environment.

GIVING HOPE TO THE ENVIRONMENT

We convert plastics into Hydrogen and/or Diesel oil, Electricity and Carbon black, in a process that offers an ideal system to take waste plastics out of the environment.

TURNING WASTE INTO REVENUE

Our solutions offer a complete "end - of-use" treatment system that can deal with the millions of tons of plastics that currently plague the world's oceans.

MISSION

The commercializing of innovative organic Waste to Energy plants across the African continent

VISION

To become a leader in providing commercial green solutions for processing organic waste.

Our Team

A TEAM WITH
A WEALTH OF KNOWLEDGE IS THE REASON REUSE TECHNOLOGIES SA IS ABLE TO
STAY INNOVATIVE AND READY TO MAKE OUR ENVIRONMENT HEALTHIER.

Director Engineering

Geoffrey G Maclaren

CEO

Shirly Paulse

Director Engineering

Peter Hurrell

Advisor

G. Roelof Niezen, PhD

Operations

Eustacia Delport

Our Business Approach

Applied Waste-to-Energy Technology for Local Municipalities Viewing Waste as a commodity instead of an expense

Imagine a future where locations across Africa have turned their waste streams into revenue streams.

Participation within the Reuse Technologies SA framework will provide local authorities with an opportunity to commoditize their waste in novel ways that benefit both the taxpayer and the local economy.

ZERO WASTE TO LANDFILL

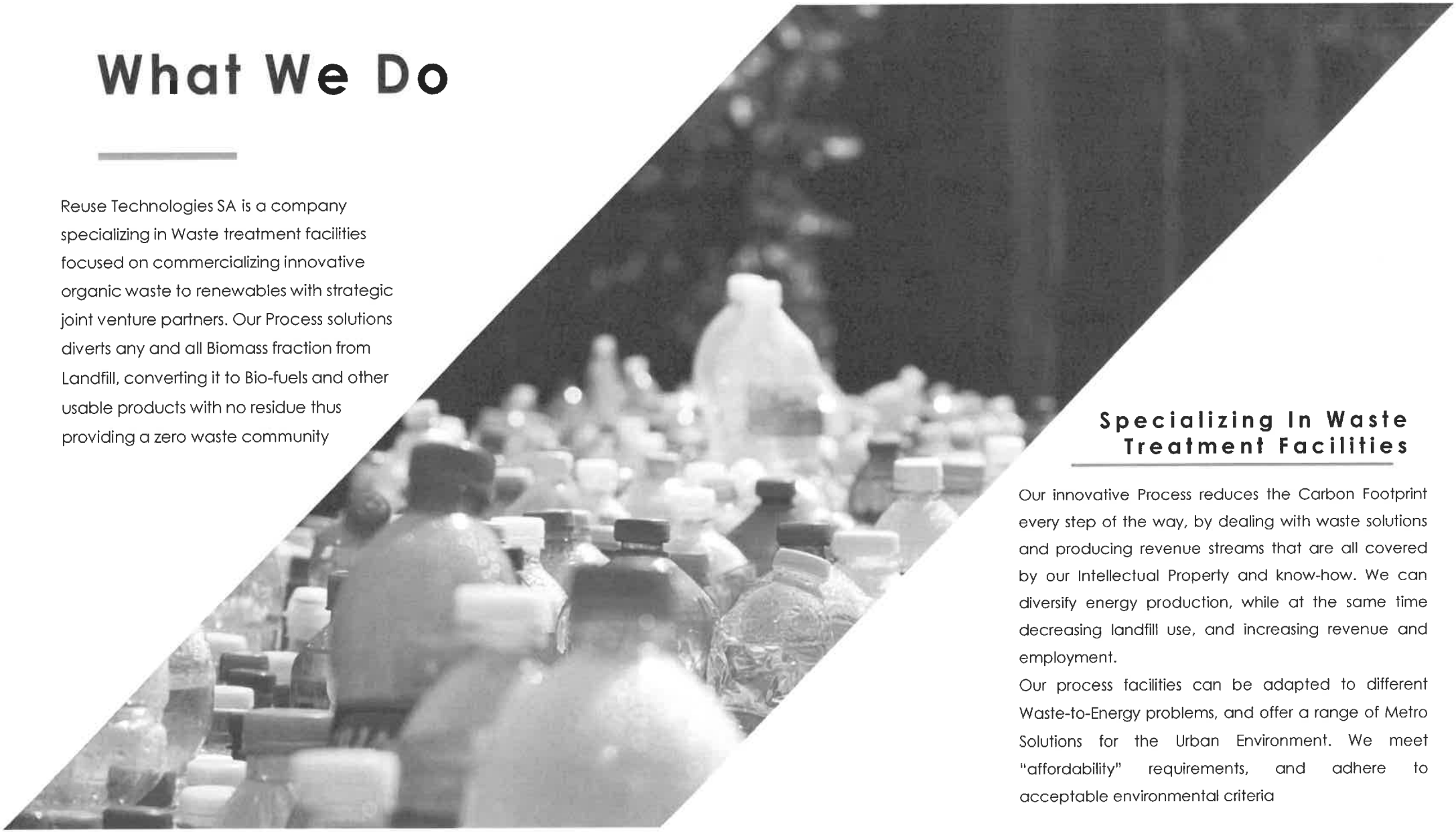
Remediate existing Strategic Landfill

Countries across Africa will be in a position to turn their waste streams into revenue streams with the potential to Remediate existing Strategic Landfill sites for Re-Use near to existing Conurbations – making the land available for Housing/Leisure/Parks. These are significant and important goals for Reuse Technologies SA.

The Reuse Technologies SA framework for applying Waste-to-Energy technologies presents an opportunity to generate more immediately, available electricity, and stored energy products. In addition to turning municipal solid waste into a commodity, we create: storable energy for future use sustainable employment various ancillary by-products business opportunities .. and .. it's easily exportable !

What We Do

Reuse Technologies SA is a company specializing in Waste treatment facilities focused on commercializing innovative organic waste to renewables with strategic joint venture partners. Our Process solutions diverts any and all Biomass fraction from Landfill, converting it to Bio-fuels and other usable products with no residue thus providing a zero waste community



Specializing In Waste Treatment Facilities

Our innovative Process reduces the Carbon Footprint every step of the way, by dealing with waste solutions and producing revenue streams that are all covered by our Intellectual Property and know-how. We can diversify energy production, while at the same time decreasing landfill use, and increasing revenue and employment.

Our process facilities can be adapted to different Waste-to-Energy problems, and offer a range of Metro Solutions for the Urban Environment. We meet "affordability" requirements, and adhere to acceptable environmental criteria

Projected Impacts

'As long as there are people, there will always be 'waste'. We try to look at the situation differently. We see 'waste' not as a liability, but as an asset! We want to change people's perception as we see Society's everyday 'Waste' as an unlimited Source of Energy, and our job is to speed up the Evolution Process through our Process - all covered by IP.'

TURN WASTE INTO REVENUE

Process Waste

230 000 – 400 000 dry tons of municipal solid waste per year

Generate Electricity

Produce outputs of the most valuable biofuel (LBM) at rates of 40 000 – 70 000 tons while also generating 5 MW – 7.5 MW of electricity per year

Landfill Diversion

Potential diversion of 100% of waste going into landfills and a return on investment within 2 -3 years of operation.

Our Strategy

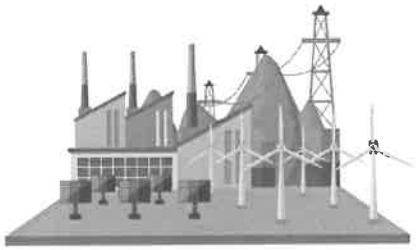
We present an opportunity to turn overflowing waste streams into much needed revenue streams with a unique market transformation model that will change how municipal waste is viewed and handled for the foreseeable future. Reduced carbon footprint- our innovative process reduces the carbon footprint.

We can diversify energy production, while at the same time decreasing landfill use, and increasing revenue and employment. Our modular process facilities can be adapted to different waste-to-energy problems, and offers a range of metro-solutions for the environment.

The design/technology process is recognised by the European Union as suitable for waste treatment. The core technology uses high pressure vessels to convert biomass to energy. The processing is totally contained in water, thus ensuring no odours, no release to the air or ground of toxic emissions or particulates (no greenhouse gases and land contamination) and all of the input materials are converted to valuable products. Saccharides are extracted and cleaned & concentrated in water and is then converted into the chosen revenue products.

END PRODUCTS

The company can consider a variety of end products, ranging from methane to butanol, aviation fuels to hydrogen, and electricity and heat.



Envisions a Public/Private/Partnership

Our Process

We make use of the process of Anaerobic Digestion in the conversion and the technology, approved by the European Union, is 100% compliant with the terms of the Kyota Protocol and the Paris agreement on climate change signed by 192 Countries in 2016. All waste will be converted to energy.

Our Process is clean and we do not burn or bury (no waste diverted back to landfill). We hugely improve energy yield and profitability of a traditional anaerobic digester system, doubling, even tripling cash flow and profits. The technology is unique and disruptive but not new. We change the landscape for cellulose to energy production.

Anaerobic Digestion-Reaction is speeded up from 20/30 days to 2 days or less which enables all the Biomass to be converted.

1

PREPARATION OF THE BIOMASS:

Assuming the input material is non-food based biomass, we mix the biomass in water and then the mixture is shredded and separated from any residual materials.

2

EXTRACTING SACCHARIDES:

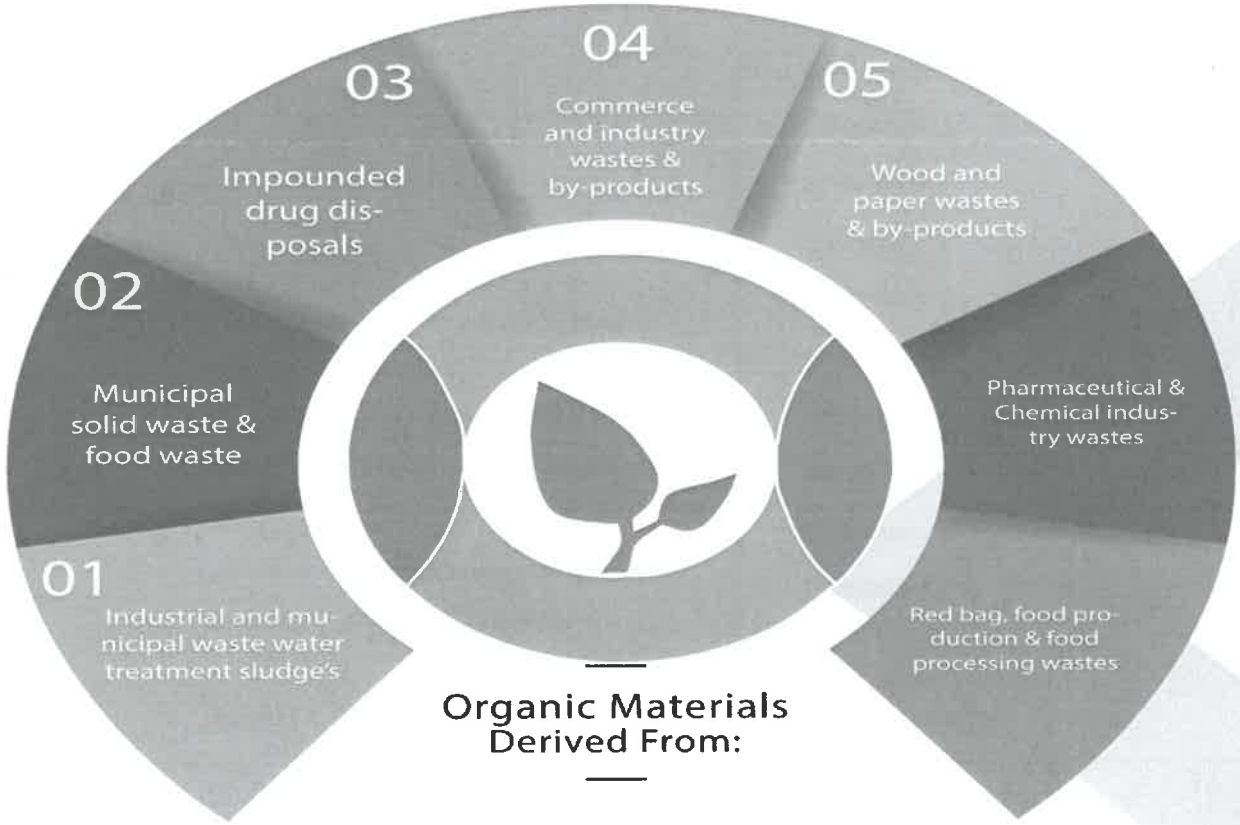
The process of extracting Saccharides from biomass uses Dilute Acid Hydrolysis. The process extracts the "Pent Up" Saccharides from the biomass. This releases the Saccharides for processing into further products.

3

CONVERSION OF SACCHARIDES INTO END PRODUCTS:

When the Saccharides are extracted, they are then cleaned and concentrated in water with the output then converted into the chosen revenue products.

Waste treatable



Inorganic & Inert Materials Derived From:

Plastics, Landfill leachate, Hydrocarbon waste

Products

TYPICAL ORGANIC WASTE INPUT -

Crop processing

Landscape debris

Scrap wood

Feed lot manure

Agriculture waste

Pharmaceutical waste

Sewer screenings etc.

Food waste

Paper waste

Hospital waste

MSW etc.

PLANT CONVERSION PROCESS -

REUSE *Conversion Process Plant converts Organic Waste to Saccharides.*

This is achieved by an innovative technology application based on Weak Acid Hydrolysis. The plant process is continuous & economic.

TYPICAL GREEN OUTPUT -

Methane

Methanol

Ethanol

Propanol

Butanol

Aviation & jet fuels

2,5 DMF

Hydrogen

Electricity

Bio-plastics

Furfural etc.

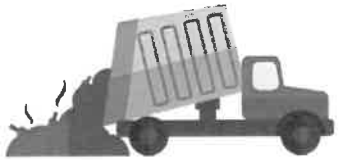
Advantages of
Our Technologies
from the process plant

Zero Waste
COMMUNITY

- No emissions to the atmosphere, no odors and no export of waste
- Design/Technology process is recognized by EU as suitable for waste development
- Biomass from waste water sludge treatment plants can be used in the process. The moisture & nutrient content of the biomass waste complements the process
- With municipal solid waste, the organic materials are diverted from landfill dumps
- After final extraction, every residue produced is inert and reusable with pre-stored biomass being able to be blended into the process

STAYING AHEAD OF THE PACK

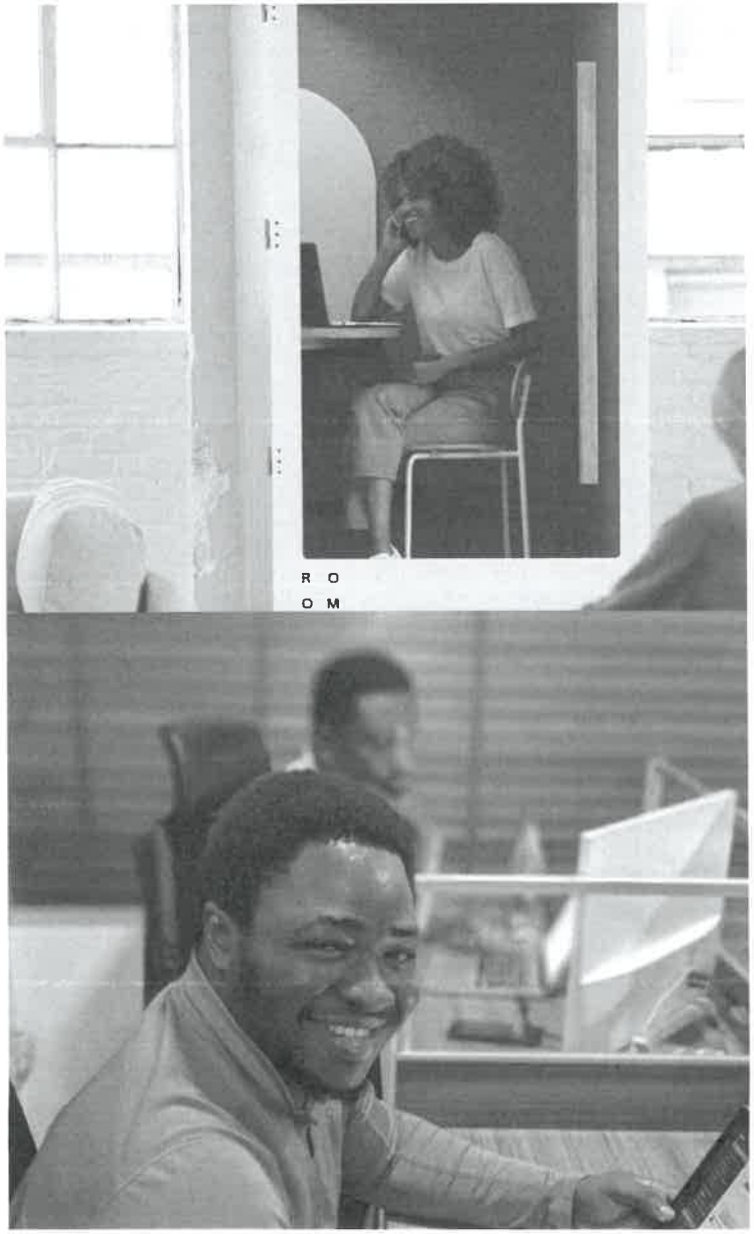
Our Methodologies



Our Waste-to-Energy technologies uses have enormous potential to provide Africa with electricity, fuel, landfill reduction options and jobs. All of this will be achieved while reducing the dependence on current capital-intensive energy production technologies.

The propriety methodologies include tried and proven technology evolved for the 21st century and beyond. Their solutions provide an opportunity to integrate current modalities for municipal waste management with a sustainable fuel production infrastructure, and distributed energy production opportunities that form the basis for waste to revenue processing.

Africa can lead the rest of World in showing how to diversify energy production, while decreasing landfill use, and increasing revenue and employment. Creating the market transformation model that changes how municipal waste is viewed and handled in Africa for the foreseeable future.



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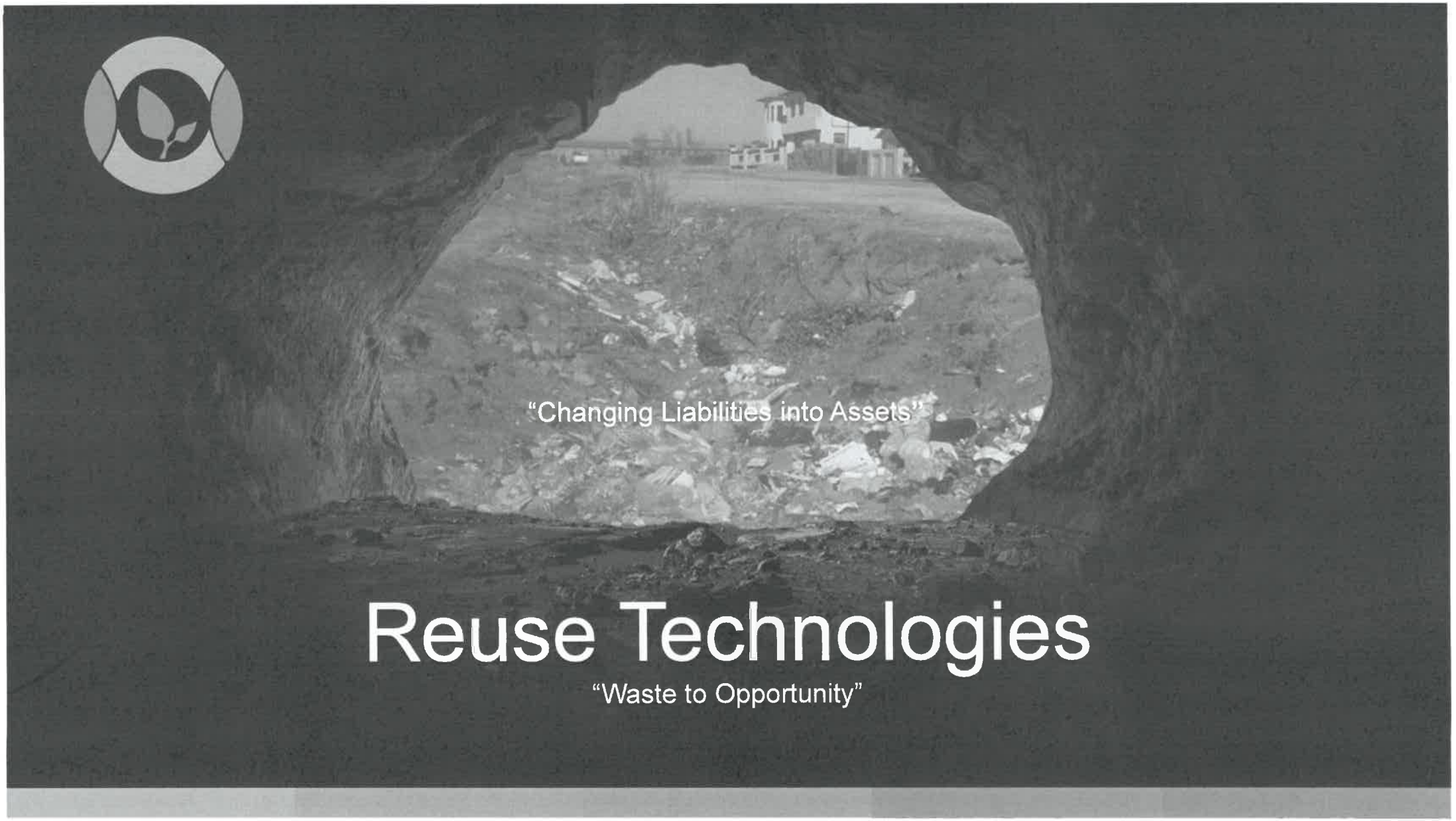
REUSE TECHNOLOGIES SA



Reuse Technologies

"Waste to Opportunity"

About

Reuse Technologies

Efficiency
Employment
Energy

Reuse Technologies is a company that specializes in waste treatment facilities. We are focused on the commercializing of innovative organic waste to saccharide plants across the African continent.

We are committed to providing high-quality products and services to our customers. We conduct research and participate in a number of initiatives to constantly develop our sector of the industry and to contribute to society. The company has developed a strategy to accelerate growth through innovation, and strengthening organisational and associates' capabilities. We continuously seeks to develop technologies and products with a holistic approach to waste management.

Core Values

Vision

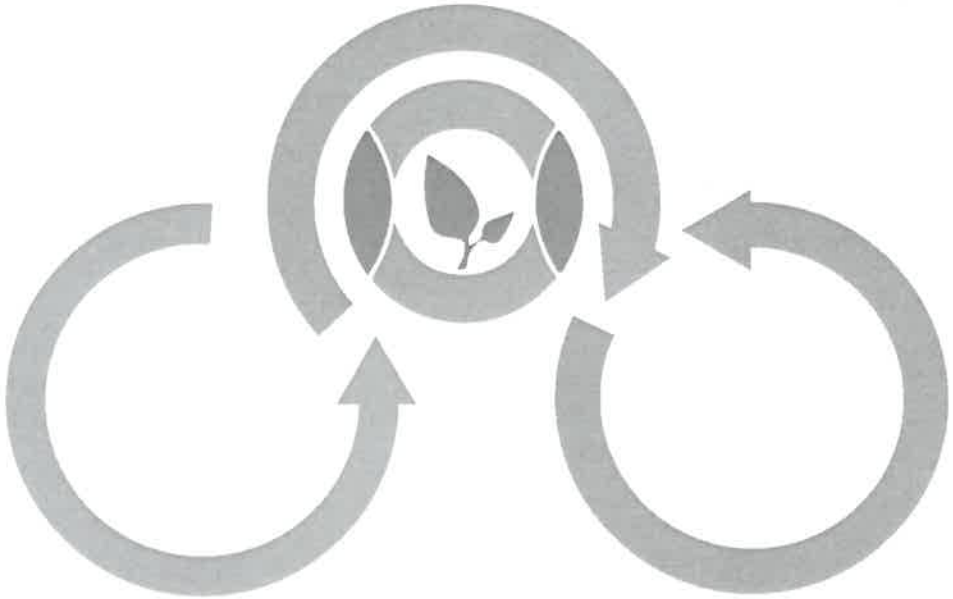
To become a leader in providing commercial green solutions for processing organic waste.

Mission

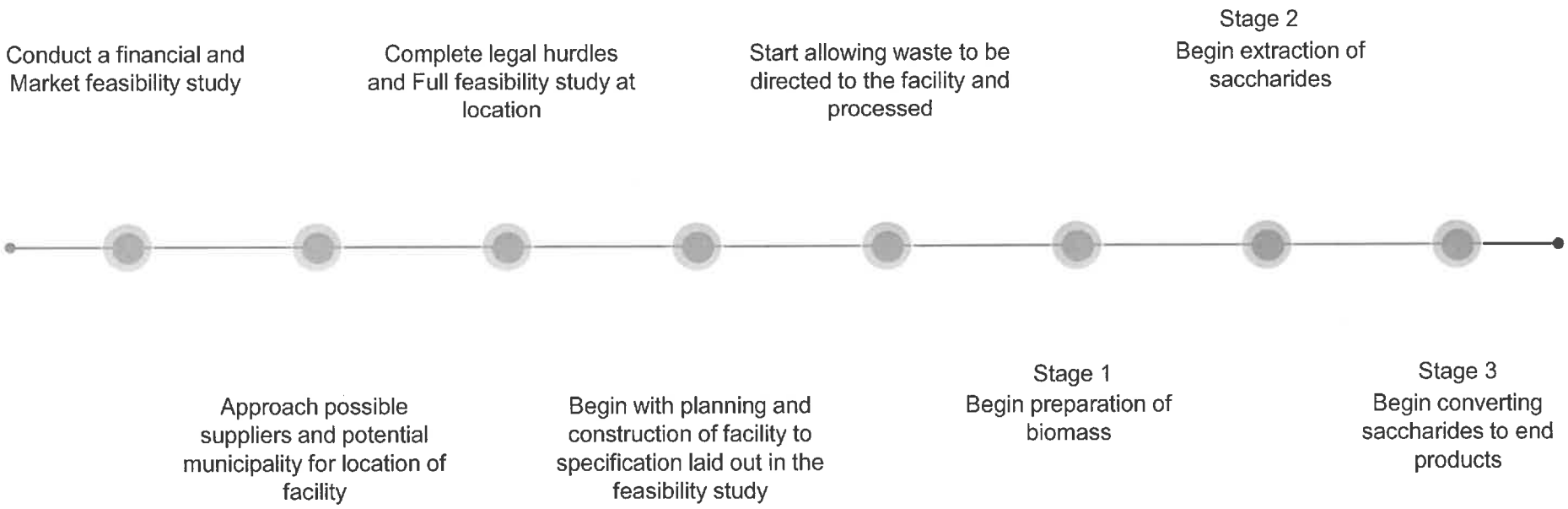
The commercializing of innovative organic Waste to Energy plants across the African continent.

Goal

A future where cities across Africa have turned their waste streams into revenue streams. Plus, the potential to Remediate existing Strategic Landfill sites for Re-Use near to existing Conurbations – making the land available for Housing, Leisure & Parks etc.



Project Objectives

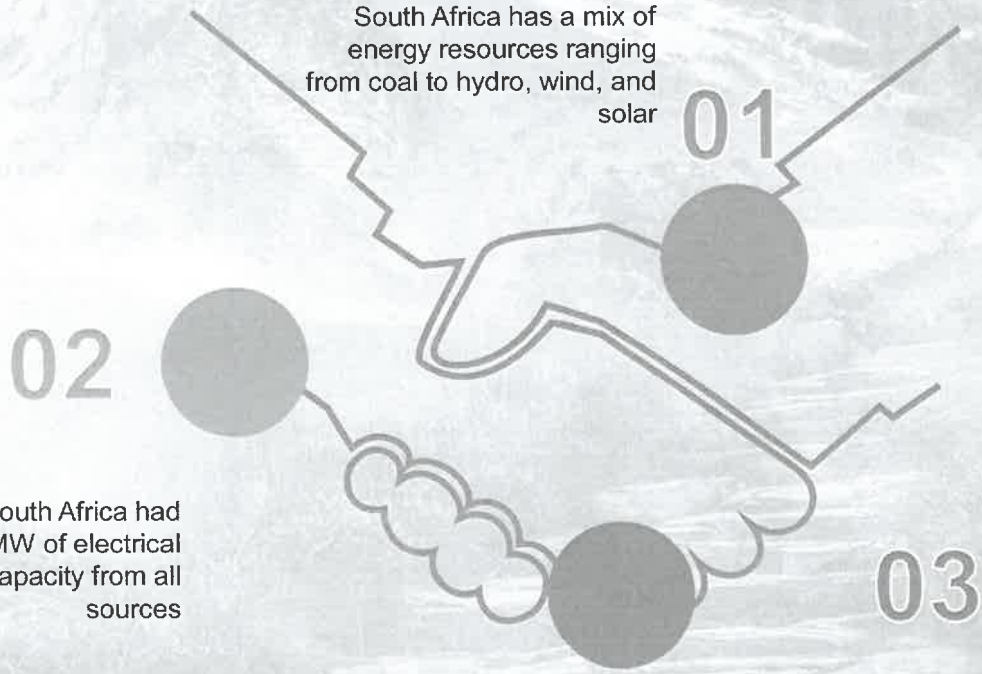


South Africa's current state

Landfill sites are projected to be full before 2025, diverting waste away from them has become a priority for metros.

Participation within Reuse Technologies gives municipalities an opportunity to commoditize their waste in ways that benefit the taxpayer and the local economy

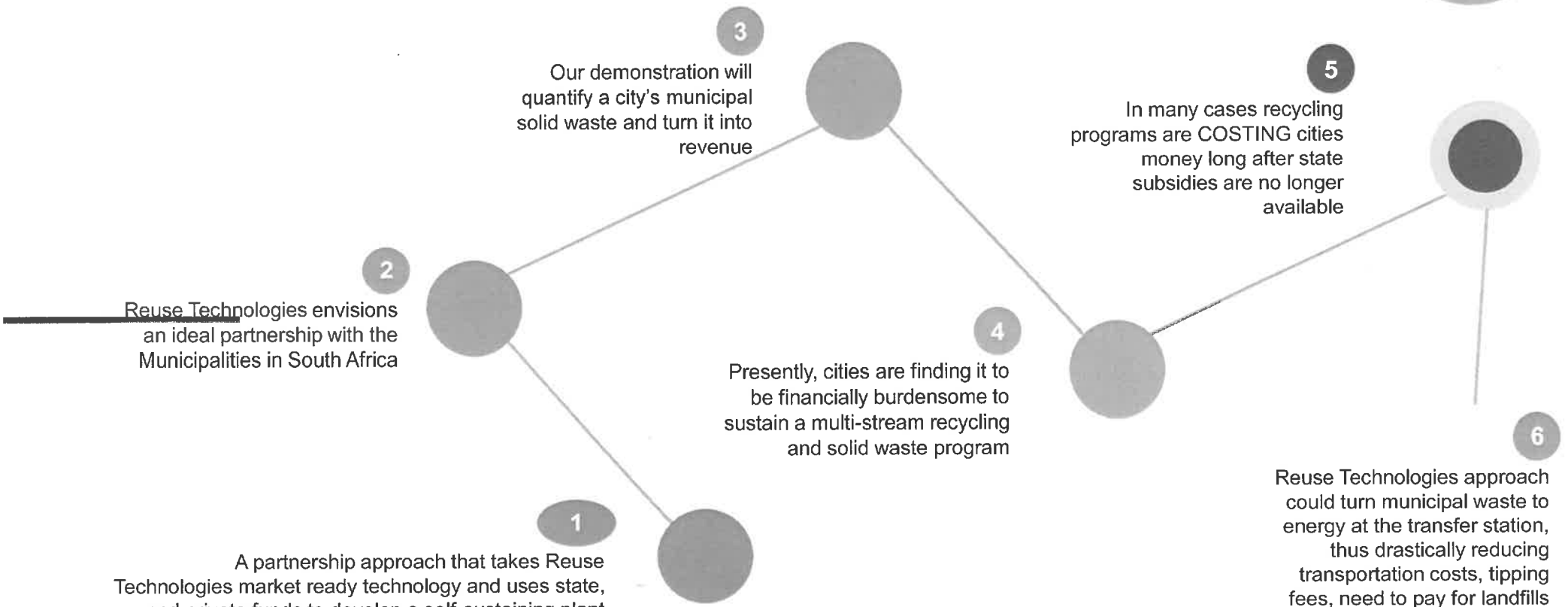
01 South Africa has a mix of energy resources ranging from coal to hydro, wind, and solar



02 In 2018, South Africa had 51,309 MW of electrical generation capacity from all sources

03 Approximately 91.2%, or 46,776 MW, comes from thermal power stations, while 4,533 MW, or 8.8%,* is generated from renewable energy sources

Road to Zero Waste Culture



3

Our demonstration will quantify a city's municipal solid waste and turn it into revenue

5

In many cases recycling programs are COSTING cities money long after state subsidies are no longer available

2

Reuse Technologies envisions an ideal partnership with the Municipalities in South Africa

4

Presently, cities are finding it to be financially burdensome to sustain a multi-stream recycling and solid waste program

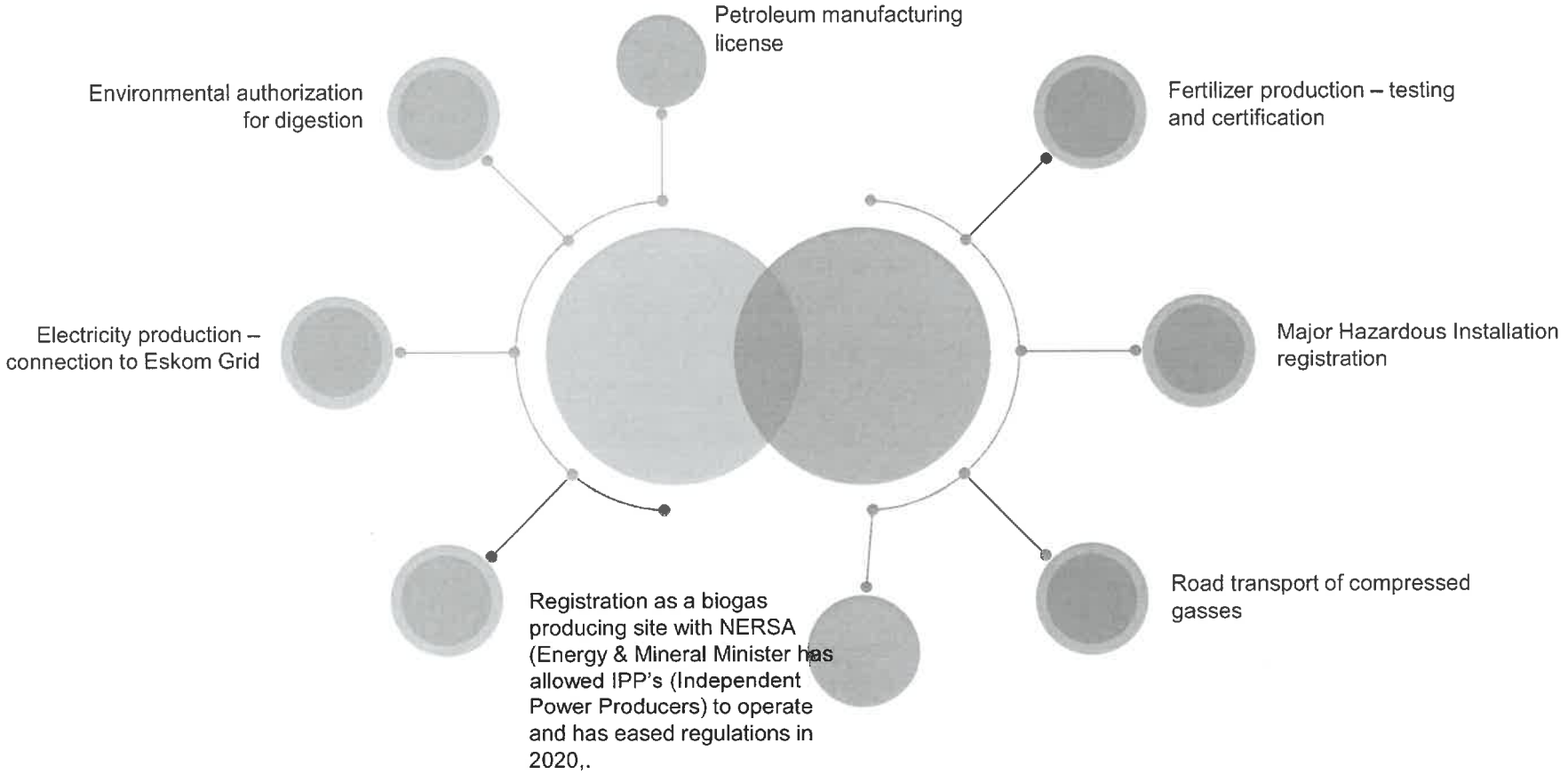
6

Reuse Technologies approach could turn municipal waste to energy at the transfer station, thus drastically reducing transportation costs, tipping fees, need to pay for landfills and also reduce the amount of land lost to landfills

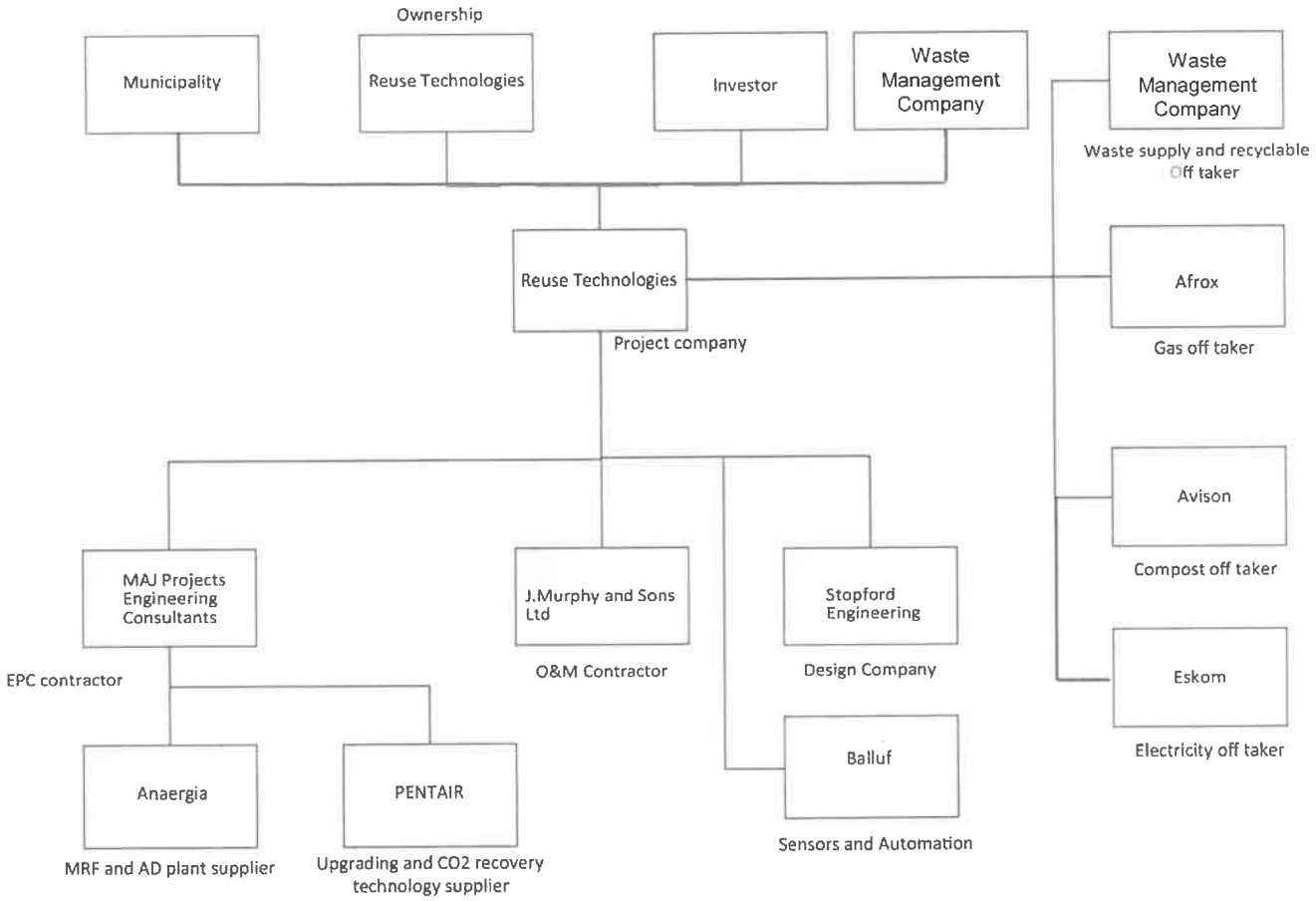
1

A partnership approach that takes Reuse Technologies market ready technology and uses state, and private funds to develop a self-sustaining plant which brings a return on investment, while lowering costs associated with managing municipal solid waste is a "Win Win" situation

Regulatory Hurdles



PROJECT STRUCTURE



The Project Team

Project Owner	Municipality	Investor
Reuse Technologies SA Consultants and Advisors	Municipality	Finance

Private Investor

Project Off takers

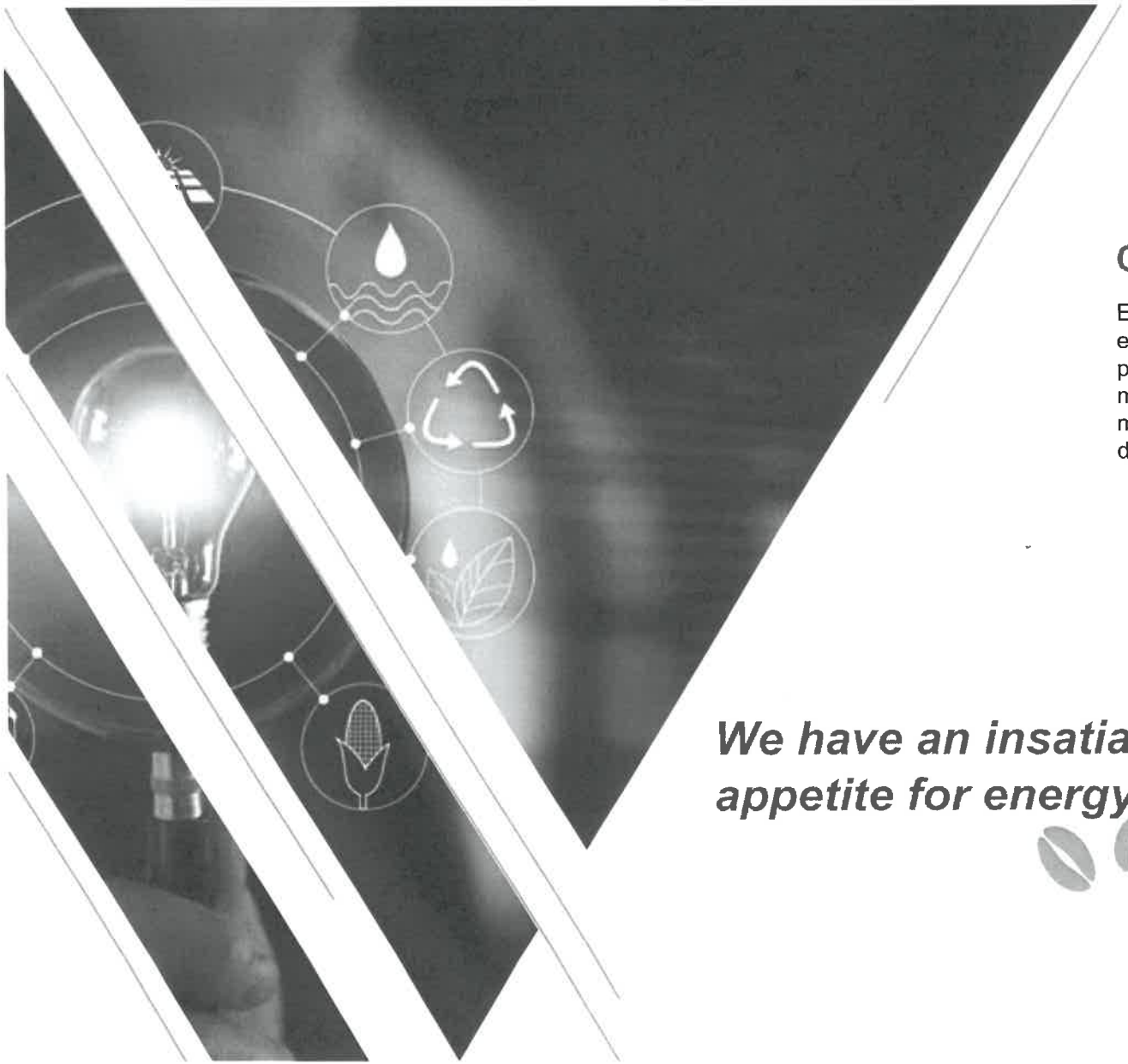
Avison
the natural way

AFROX

Avison	Afrox	PowerEx
Compost Offtaker	Gas Offtaker	Electricity Offtaker

Eskom

Electricity Offtaker



Challenges To Municipalities

Ever increasing population totals, increased on demands on existing resources and the pressure to provide basic needs has placed significant pressure on cities in terms of waste management. Coupled to this, the rejection of common waste management practices by environmental lobbyists has made the disposal of various waste streams a lot more difficult.

We have an insatiable appetite for energy

The impact of waste on the environment and on people's health is also a critical point of concern.

Imagine a world where the Demonstration-testing for waste-to-energy technology adoption was supported from the state and municipal level, and our waste was viewed as a commodity instead of an expense. Initially, the proportion of states and cities that see the opportunity will be modest, but the ReUse proposal will justify an extended development of waste-to-energy infrastructure in the focus area, and quickly balance the proportion.

Holistic Approach

To Waste Management

- ✓ Participation within the ReUse framework will provide the Municipality with an opportunity to commoditize their waste in novel ways that benefit both the taxpayer and the local economy.
- ✓ The ReUse framework for applying waste-to-energy technologies presents an opportunity to generate more immediately available electricity, and stored energy products. In addition to turning municipal solid waste into a commodity, we create:

Approach To Combat Harmful Waste

Storage energy for future use

Various ancillary by-products

Business opportunities

Sustainable employment

Partnership

A Build-Operate-Transfer business model with concessions will be used in the WTE project with Municipalities. 3rd party investment will be used to finance the WTE Process Plant and operate it commercially. The project company/owner, Reuse Technologies SA will put off take agreements in place with gas, compost, waste companies, including Eskom/Power Ex to ensure the smooth purchase of the end products. Reuse Technologies SA, Municipality (R1,85 million) and Investors shall invest in the project and own equity by different ratio and in so doing will form the partnership through an Unsolicited bid process with a Service Level Agreement in place. Reuse will transfer the project after a period of 10 years. Reuse will operate and maintain the infrastructure from implementation through to year 10.

After said period, Reuse will return the operation ownership to the Municipality with concessions at no cost to the Municipality. The expected cash flow produced by infrastructure (Process Plant) during the term of operation will be distributed as per stipulated equity structure. After a period of 10 years of operation, a stage by stage seamless transfer of the Waste to Energy Process Plant will take place. This will involve a transfer of operations with continued extended technical support from Reuse Technologies SA over an agreed upon period as is deemed necessary

WASTE INTO REVENUE

Reuse Technologies SA, in partnership with the Municipality, could have a commercially viable Facility built and producing revenues within the first two years of starting operations.

EFFICIENCY EMPLOYMENT

- ✓ Imagine a future where locations across South Africa have turned their waste streams into revenue streams. Plus, the potential to Remediate existing Strategic Landfill sites for Re-Use near to existing Conurbations – making the land available for Housing, Leisure & Parks etc. These are significant and important goals for ReUse.

Impacts

Municipal and private waste management operators, energy sales and distribution companies, and local industries that use and export Liquefied Natural Gas (LNG) products, will all benefit immensely from our technologies.

The projected impacts of our demonstration research include the ability to process through each Facility:

230,000 - 400,000 dry tons of municipal solid waste per year.

Outputs of the most valuable biofuel (LBM) at rates of 40,000 - 70,000 tons.

Generation of 5 MW - 7.5 MW of electricity.

Creation of up to 1000 direct and indirect jobs.

Diversion of 100% of waste going into landfills.

A Return On Investment Within 2 To 3 Years.

Electricity vs Gas use

Electricity

Generation license required over 1 MW

Energy sale price of 61.47 c/kWh in CoCT

REIPPP risks and process (100c – 77c/kWh)

Technology Choice

Thermal – heat, steam and electricity

MBT and AD – recyclables, commodity chemicals, solid fuel and compost

Waste value dependencies

Calorific content

Putrescible organic concentration

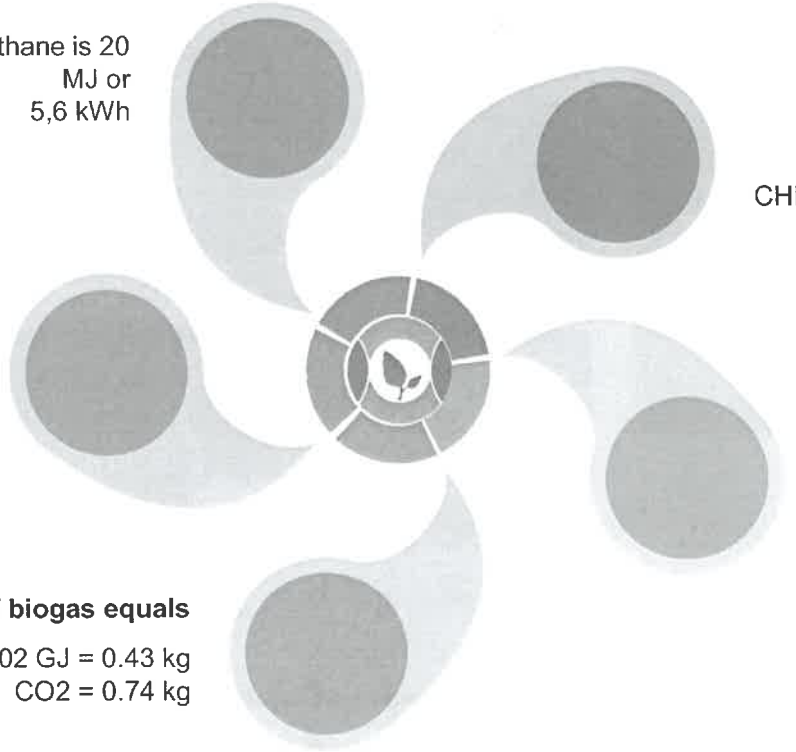
Contamination

Electricity vs Gas use

1 Nm3 of biogas at 60% methane is 20 MJ or 5,6 kWh

CHP allows for up to 85 % recovery

Conversion to electricity only converts 39% of this into usable energy. 1 Nm3 = 2.2 kWhe



With a processing cost this can be converted into products that are worth more than the income through electricity sales

1 Nm3 of biogas equals

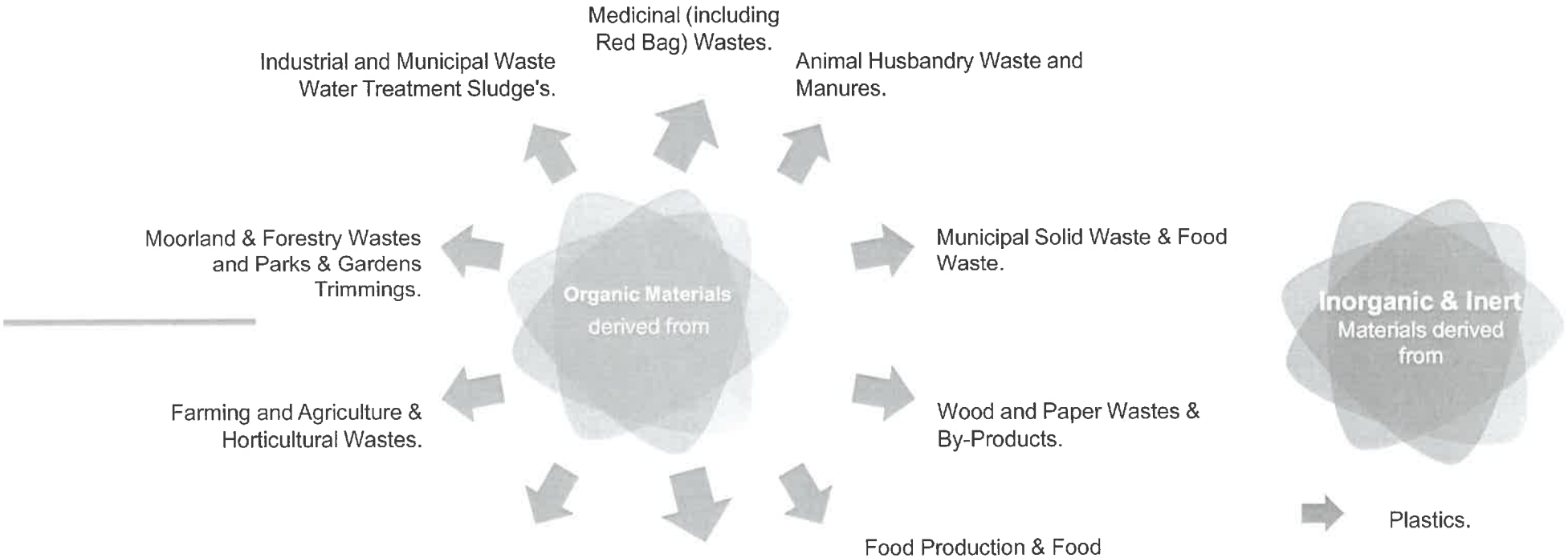
CH4 = 0.02 GJ = 0.43 kg
CO2 = 0.74 kg

Electricity vs Gas use

Commodity	Price	R/GJ
Paraffin	R233	R/GJ
LPG	R396	R/GJ
Electricity	R 214	R/GJ
Natural Gas	R 160	R/GJ
Diesel	R 349	R/GJ
Solid Fuel	R 28	R/GJ
Charcoal	R 120	R/GJ
Coal	R 31	R/GJ

Waste Treatable

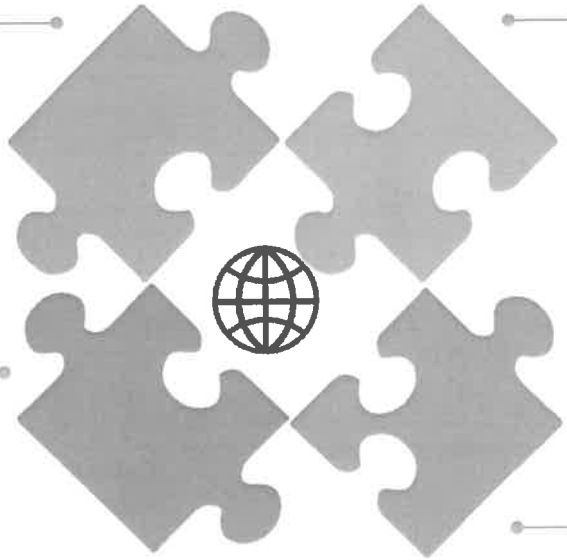
By Our Technology



Products Organic fertilizer

Degraded food material to form a compost like product.

Analysed on a frequent basis for macronutrients, micronutrients and contaminants



Dewatered to ~30% solids. 100 tons per day produced.

Perfect for soil remediation and lawn farming

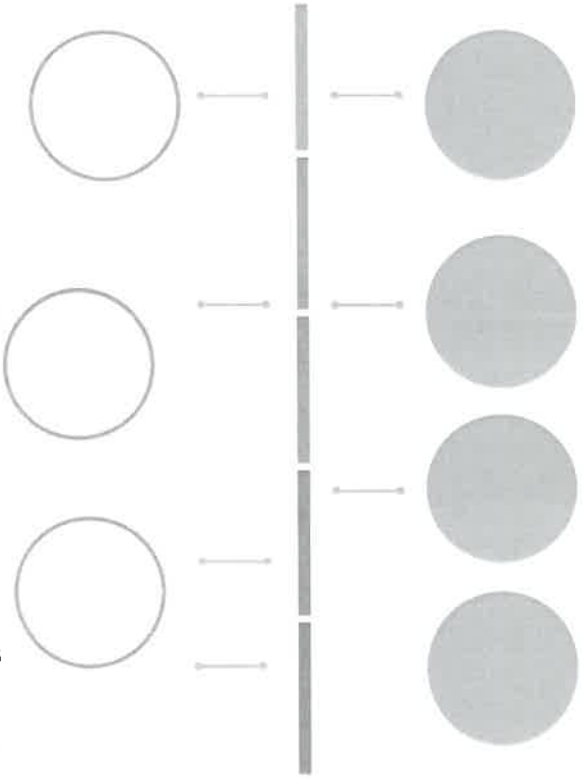
Products

Bio CNG

Moved from site with compressed gas trailers Compressed to 250 barg >95% methane

Methane is proposed to be compressed and liquefied for storage. Output of Methane will be enhanced within a few years of setting to work.

Additional products made in the process includes Carbon Dioxide (which will be compressed and liquefied and then dry ice for storage)



Solid fuel - RDF

Higher calorific value than unsorted MSW

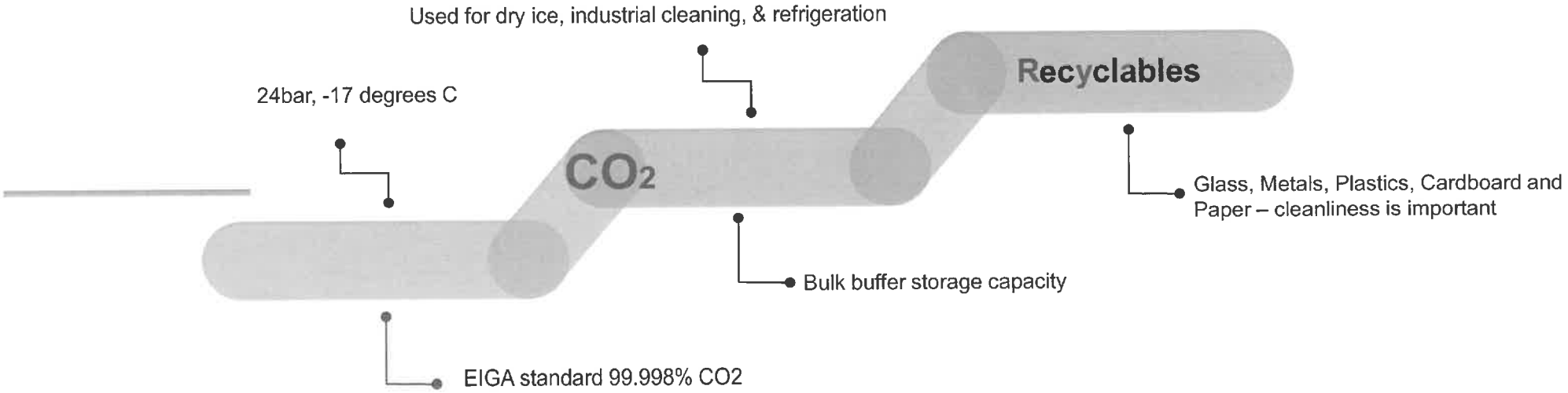
Reduced organics, metals, bulky material

Mostly unrecyclable plastics, textiles and paper

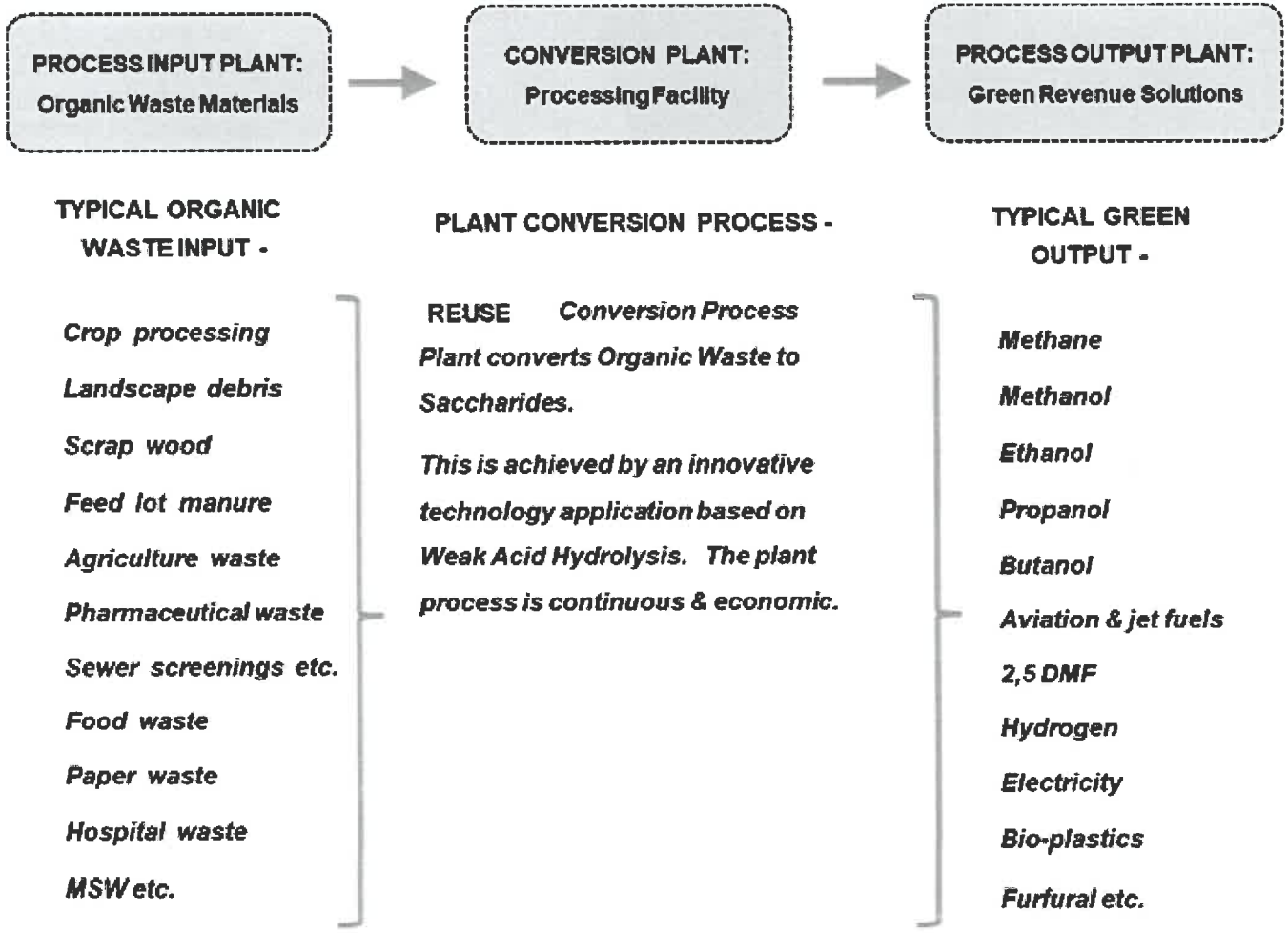
Furfural (a solvent)

Struvite (a fertilizer)

Products


Used for dry ice, industrial cleaning, & refrigeration
24bar, -17 degrees C
CO_2
Recyclables
Glass, Metals, Plastics, Cardboard and Paper – cleanliness is important
Bulk buffer storage capacity
EIGA standard 99.998% CO2

Products


PROCESS INPUT PLANT:
Organic Waste Materials
CONVERSION PLANT:
Processing Facility
PROCESS OUTPUT PLANT:
Green Revenue Solutions
TYPICAL ORGANIC WASTE INPUT -
Crop processing
Landscape debris
Scrap wood
Feed lot manure
Agriculture waste
Pharmaceutical waste
Sewer screenings etc.
Food waste
Paper waste
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Methane
Methanol
Ethanol
Propanol
Butanol
Aviation & jet fuels
2,5 DMF
Hydrogen
Electricity
Bio-plastics
Furfural etc.

EDUCATION

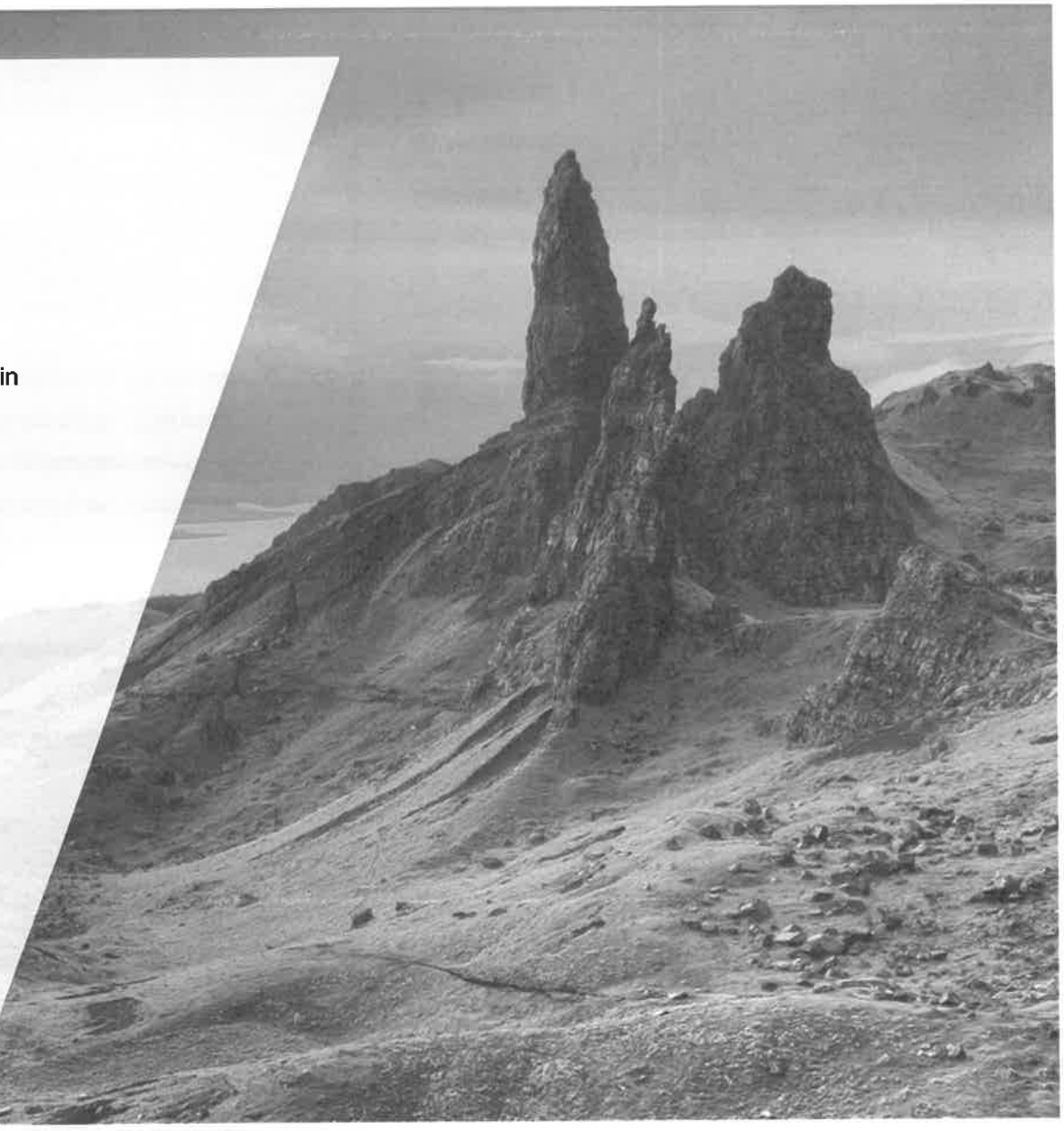
CENTER OF EXCELLENCE

- Reuse Technologies SA plans to set up Education Centres in each facility location for Training and for Research & Development. This will be an on-going program and will be applied to every Demonstration Site. The company will be organizing a separate dedicated budget for this activity.
- The company is planning to organize general job training for all aspects of its modular waste treatment facilities. In addition, the Education Centres will provide Professional Renewable Energy Courses, for example: Postgraduate Certificate in Energy & Fuels from Waste..
- Most of the proposed courses will be developed in partnership with local Education Institutions and Universities. The company is aiming to address the skill shortages that can be identified in this rapidly evolving business sector. The educational courses will cover a broad curriculum that will include the following areas:

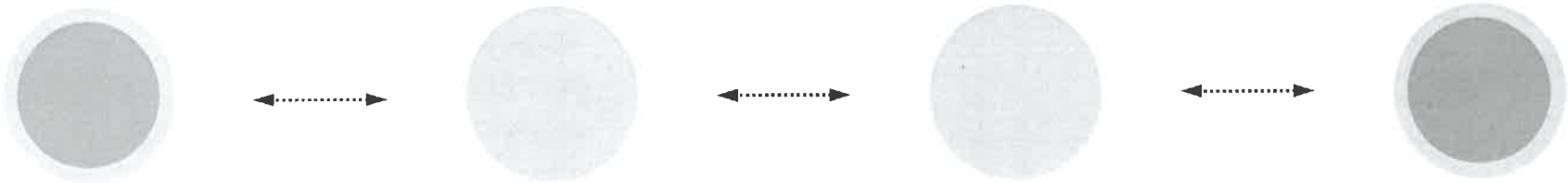
Regulatory

Financial **Technical**

Operational **Environmental**



The company is proposing initially to have formal accreditation in the following four Modules:



1 Module

Feedstock's and Technologies for Energy & Fuel Generation

2 Module

Management of Energy & Fuel Generation Project

3 Module

Environmental Management of Waste Derived Energy Generation

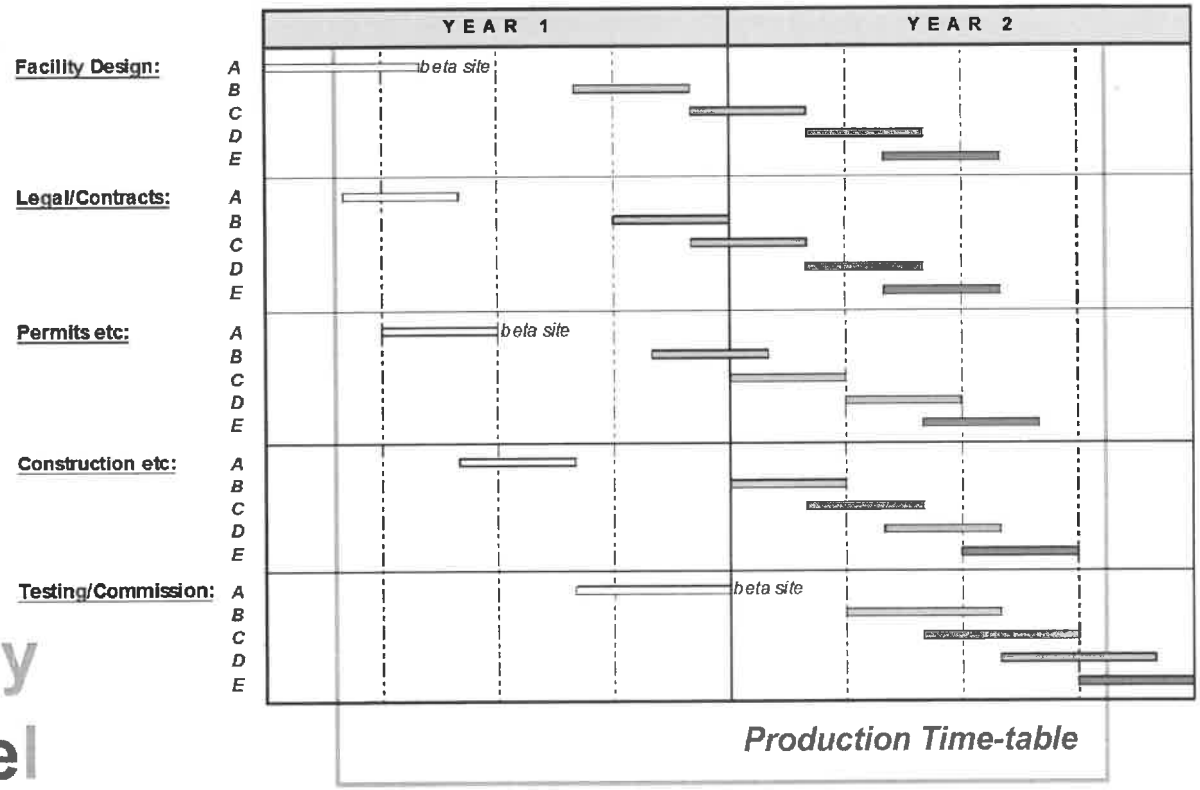
4 Module

Operation and Maintenance of Energy & Fuel Generation Plant

CENTER OF EXCELLENCE

Reuse Technologies plans to start the process of marketing and selling Waste to Revenue Process Facilities as soon as its funding is in place. Within the first year the company will use its Demonstration Plant and Training Facility as a showcase to generate sales of its technology and implementation.

Company Revenue Model



Production Time-table

Revenue Model

The company will derive revenues from:

- Operations and Maintenance of third-party Process Facilities
- Sales of Waste to Revenue Process Facilities
- Royalties and License Fees

Other potential Company income sources are from:

- Sharing revenues from process inputs
- Sharing revenues from process outputs

Regarding strategic partnerships – the company is well-positioned to share in revenues from:

- contracted gate fees from process input
- income arising from process outputs

DESIGN

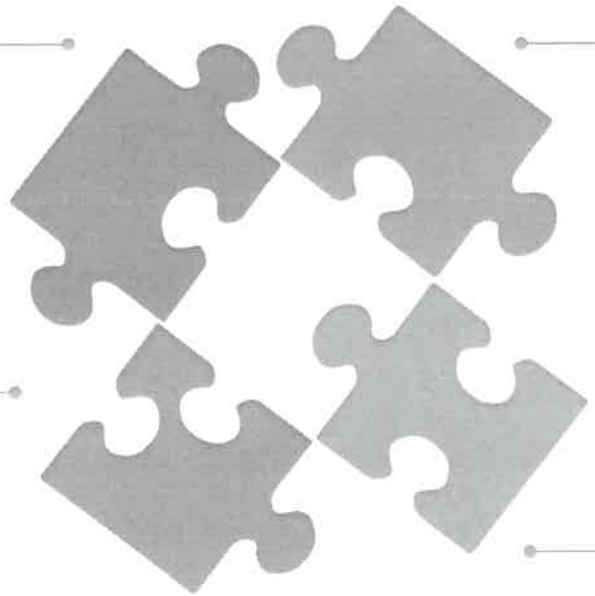
Construction

Process is Insured

SWOT Analysis

Strengths

- Green/positive/remedial impact on environment
- Experts in the field
- Strong and versatile management team
- Unique proprietary technologies
- Produces revenues from waste materials



Threats

- Emerging competitors
- Maintaining steady supply of input materials
- Need competent engineers for design/construction
- Changing regulatory environment

Weaknesses

- Dependent on waste material supply chain
- Lack of skilled trained operatives
- Competition - "don't know what you don't know"

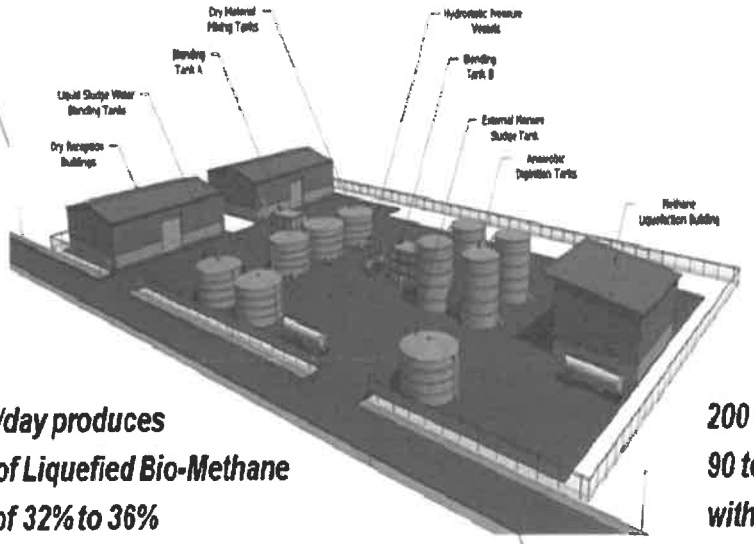
Opportunities

- Become South Africa & Africa leader in waste management
- End products can be "made to order"
- Create South Africa & Africa standards for waste treatment
- Provide green solutions for waste/landfill problems
- Potential Carbon Credits revenue stream

INTERGRATING PROVEN TECHNOLOGIES

Reuse Technologies SA anticipates that its Facility will be located in the Municipality. Development of this plant and training Facility will start as soon as the necessary funding is in place. By the end of the first year, the Company plans to start work on up to four further facilities in other locations, to be agreed.

COMPANY MODEL: 70,000+ DRY TONS ANNUAL INPUT



200 dry tons/day produces 30 tons/day of Liquefied Bio-Methane with an IRR of 32% to 36%

200 dry tons/day produces 90 tons/day of Saccharides with an IRR of 10% to 20%

REUSE TECHNOLOGIES SA