



# Sustainable Energy Manufacturing: eThekweni Municipality

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Margaret McKenzie

[www.kznenergy.co.za](http://www.kznenergy.co.za)

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[info@kznenergy.co.za](mailto:info@kznenergy.co.za)

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# Acronyms

KSEF	KwaZulu-Natal Sustainable Energy Forum
KZN	KwaZulu-Natal
PV	Photovoltaic
REIPPPP	Renewable Energy Independent Power Producer Procurement Programme
SE	Sustainable Energy
SWH	Solar Water Heater
TIA	Technology Innovation Agency

## Introduction

The KwaZulu-Natal Sustainable Energy Forum (KSEF) is a not-for profit company. The mission of KSEF is to facilitate the development and growth of the sustainable energy sector in KwaZulu-Natal, South Africa through information dissemination, the facilitation of networking within the sector, and the implementation of enabling projects.

A key contributor to a vibrant sustainable energy sector is a range of local manufacturers of a variety of sustainable energy goods. To better understand the existing sustainable energy manufacturing base a short survey was conducted of key manufacturers in the eThekweni Municipality area.

This report outlines the results of this survey and provides an overview of the key characteristics of the existing manufacturing sector.

## Acknowledgements

KSEF would like to thank the Energy Office of eThekweni Municipality for funding this report. Furthermore, we would like to thank officials from the Energy Office and the Economic Development Unit of eThekweni Municipality, Trade and Industry KZN and the Provincial Department of Economic Development and Tourism for advice regarding the survey process. We would also like to thank all the manufacturers who gave up their time to be interviewed for this report and provide us with an insight into the challenges of manufacturing in the sector.

## Survey Approach

A number of channels were used to identify existing manufacturers in the eThekweni Municipal Area:

1. Identification of manufacturing entities listed on the existing KwaZulu-Natal Sustainable Energy Forum business directory.
2. Identification of Sustainable Energy (SE) manufacturing entities identified in the Green Economy study commissioned by the Economic Development Unit of eThekweni Municipality.
3. Internet searches.
4. Input from stakeholders knowledgeable in the sector.
5. Input from manufacturers themselves, known as snowball sampling.

Because of the small size of the sustainable energy manufacturing sector in KwaZulu-Natal, face-to-face and in some case telephonic interviews were conducted with all the identified entities that were available for an interview during the study period. Interview questions were open-ended allowing for the respondent to answer according to their interpretation of the question. In some instances the interviewer gave prompts to better explain the meaning of the question.

The interviews covered a range of issues including:

1. The products made by the company.
2. Financial information regarding turnover, capital investment and access to finance.
3. Information on the target market of the company.
4. Staff and skills requirements.
5. Impact of the regulatory environment.
6. Challenges, opportunities and expectations of the future.

# Overview of Sustainable Energy Manufacturing

## General

The SE manufacturing sector in the eThekweni Municipal Area is small and in total sixteen entities were identified that manufacture in this broad sector. These are summarised in the table below. Interviews were secured with nine of the entities.

Organisation Name	Website	Products	Interview
<b>Artsolar</b>	<a href="http://www.artsolar.net">www.artsolar.net</a>	Solar Photovoltaic (PV) modules	Yes
<b>Solar Beam</b>	<a href="http://www.solarbeam.co.za">www.solarbeam.co.za</a>	Flat plate solar water heating systems	Yes
<b>Natural Balance</b>	<a href="http://www.nb-wonderbag.com">www.nb-wonderbag.com</a>	Heat retention cooker	Yes
<b>Solar PriMeg</b>	<a href="http://www.solarPriMeg.co.za">www.solarPriMeg.co.za</a>	Flat plate solar water heating systems	Yes
<b>Jabulani Holdings</b>	<a href="http://www.jabulaholdings.co.za">www.jabulaholdings.co.za</a>	Flat plate solar water heating systems	Yes
<b>Mod-u-Flow</b>	<a href="http://www.moduflow.co.za">www.moduflow.co.za</a>	Heat exchangers	Yes
<b>Adept Airmotive</b>	<a href="http://www.adeptairmotive.com">www.adeptairmotive.com</a>	Light aircraft engines	Yes
<b>Rocket Works</b>	<a href="http://www.rocketworks.org">www.rocketworks.org</a>	Wood-fuelled cooking stove	Yes
<b>Hi –Tech Pressure Engineering</b>	<a href="http://www.pressure.co.za">www.pressure.co.za</a>	Heat Exchangers	No
<b>SA Heat Exchange</b>	<a href="http://www.saheatexchange.co.za">www.saheatexchange.co.za</a>	Heat exchangers	No
<b>GC Biofuels</b>	<a href="http://www.gcbiofuels.com">www.gcbiofuels.com</a>	Biodiesel processors	No
<b>Biocorp Holdings</b>	<a href="http://www.biocorpholdings.com">www.biocorpholdings.com</a>	Bio-ethanol	No
<b>Green Heat South Africa</b>	<a href="http://www.greenheat.co.za">www.greenheat.co.za</a>	Gel-fuel	No
<b>Khwezi Oils Biodiesel</b>	N/A	Biodiesel	Yes
<b>Hlomelang marketing</b>	N/A	Bioethanol gel	No
<b>Smiths Manufacturing</b>	<a href="http://www.smiths.co.za">www.smiths.co.za</a>	Heat exchangers	No

While several of the businesses such as Solar Beam, Solar PriMeg, Adept Airmotive and Mod-u-flow have been operating for over ten years, many of the companies have only been operating for a few years.

Most of the businesses have between one and three owners. In these cases the owners are also the senior managers of the business. Two of the companies have a larger range of shareholders not all of whom are directly engaged in day-to-day management of the business.

## Financials

Most of the companies preferred not to share details on their annual turnover. Turnover figures that were shared ranged from R1 Million per annum to R10 Million per annum. Several of the companies reported being in a development phase and provided projected turnover figures in the event that the business developed as planned. In these cases projected turnover ranged from R25 Million to R750 Million.

With regards to capital investment in the business almost all companies reported that most of their capital investment was self-financed by shareholders. Two of the companies interviewed reported accessing bank loans and one reported accessing a loan from a government entity. Since most businesses were self-financed they did not report any barriers to accessing finance. However, two businesses had experienced barriers to accessing finance that prevented them expanding their businesses. One of the businesses concerned indicated that a key barrier was the novelty of their product and the lack of a real track record for the company. The two companies that had accessed bank loans did not feel that they experienced barriers and attributed their success in this area to their existing track record.

Some companies were unsure of the scale of their capital investment because of continued invest over a number of years and others preferred not to share the scale of their investment. Capital investment figures that were provided ranged from between R500,000 to R11 Million.

## Market

Five of the businesses interviewed indicated that they are currently exclusively focussed on the South African market. In the past some of these companies had some limited export orders and some of them hoped to develop some export orders in the future, however their core focus will remain on the South African market.

Two companies reported that they sold their product both within South Africa and also exported their product to a range of other countries. A further two companies, both of which are in development phase, reported that while they planned to have some South African sales, they expected that the majority of their sales would be for export.

The target markets of the businesses varied. Four of the businesses mainly focused on sales to households or residential users. Four others targeted business customers for their sales. One of the businesses, with a product designed for household use, expected that most of their sales would come from large scale orders from donor organisations. Another business had a niche target market of light aircraft owners which could include both individuals and businesses.

The majority of businesses employed a dual sales strategy of both selling to their target market and making use of distributors. Four of the businesses relied exclusively on direct sales. Some of the businesses that handled their sales directly highlighted the technical nature of their product and the need for the people who design and make the product to be in direct contact with potential clients for quality assurance.

A number of the businesses indicated that a barrier to sales of their product was a lack of understanding by consumers of sustainable energy products. Two key issues were cited. Firstly consumers often did not know of the existence of the product and why it would be of benefit to them. Secondly the technology often caused confusion, for instance in the Solar Water Heating sector consumers need to be educated that water storage requirements of Solar Water Heating systems was different from that of a conventional electric geyser. As a result a significant portion of marketing effort by these businesses was devoted to educating potential consumers. This results in an additional marketing cost. Firstly the businesses need to educate the consumer about the product category and then secondly attempt to sell their particular product.

## Competition

Five of the businesses interviewed reported high levels of competition particularly from Asian imports. All these businesses indicated that in general they are not able to compete with these imported products when it comes to price. Some of the businesses expressed the view that their international competitors received subsidies from their governments to enable them to be more competitive price wise.

Businesses cited two main ways in which they competed against imports. Firstly the businesses focussed on ensuring that their own product was of a higher quality than cheaper imported alternatives. This involved specific adaptations to the South African context, use of high quality materials and unique patented features of their product. A second strategy involved the provision of high quality after sales service. Businesses indicated that this was a significant way in which they could differentiate themselves from imported products where customers would find it more difficult to access after sales service in cases of equipment failure and maintenance requirements.

In contrast two companies reported that they were significantly price competitive in comparison to imported products. In one the case the company's product is a significant technological advancement on existing products and is both cheaper to purchase and cheaper to run than existing products. In the case of the second company the key input for

the product is waste and as a result the company is able to sell its product at below the price of the imported equivalent.

One company reported that there is currently no other significant maker of their product.

## **Government Support and Legislation**

In terms of direct financial support one company reported having received an equity investment from the government's Technology Innovation Agency (TIA). As a result the TIA is a shareholder in the business. The same company has also received a royalty grant from government that is a loan which is paid back in royalty on sales. A second company indicated that they expect to receive some limited support from government through the Department of Trade and Industry's manufacturing support programme.

With regards to indirect financial support, two of the Solar Water Heater (SWH) manufacturers reported that the existing subsidy on SWHs supplied through Eskom was a significant factor in assisting their sales. Both identified the potential removal of the subsidy as a future risk to their businesses. The single Solar PV manufacturer, ARTsolar, indicated that the Eskom rebate that was offered on small scale renewable energy installations was potentially of assistance to their business, however the rebate is no longer available and it is not clear if it will be reintroduced at a later stage.

One of the SWH manufacturers reported receiving marketing support through their participation in the Shisa Solar programme run by eThekweni Municipality.

Government legislation and policy was also cited as either a support or a significant potential support by some of the businesses. In particular, two of the SWH manufacturers reported that the regulations on new buildings which specific a maximum of 50% of a new building's water heating can come from electrical resistance also assisted their sales.

ARTsolar indicated that government requirements for local content in the Renewable Energy Independent Power Producer Procurement Programme (REIPPP) could significantly assist their business if correctly framed in later phases of the programme. Natural Balance indicated that the carbon tax may be of assistance to their business as it could further support its sale of carbon credits associated with the use of its product. Natural Balance retains the ownership of the carbon credits for all the wonderbags it sells and its carbon credits are accredited in terms of the Verified Carbon Standard.

## **Patented technology, research and development**

In terms of technology, businesses fell into two distinct categories. Many of the businesses were using processes from the public domain and did not have any patents on their products. On the other hand, several businesses had developed unique products, which they had patented to ensure that they retained ownership.

Almost all the businesses reported investing heavily in research and development with some businesses indicating that the majority of the investment so far had been spent on research

and development. Research and development effort focussed on improving existing production processes, developing new products appropriate for different markets or contexts, and optimising existing products.

## Employment

Seven of the businesses interviewed were able to share their current staff figures; collectively they estimated that approximately 86 people are employed. The smallest number of staff reported was one and the largest 30.

Several businesses reported being in a development phase and indicated that in the next few years they hoped to increase their employment figures considerably. In total these businesses estimated that an additional 180 jobs would be created in the sector over and above the existing employment figures.

Several of the businesses currently outsource their production. In most cases these businesses plan to establish their own production facility at some stage and employ their own staff.

Businesses reported needing a variety of skills in their businesses ranging from skills needed for general business operation to other skills specific to their production processes. In limited cases, businesses employed staff with pre-existing qualifications that would help in the production process, but most businesses did not require their production staff to have an existing qualification. Almost all businesses focussed on in-house training of staff and only made use of external training courses occasionally.

## Inputs and raw materials

Because of the wide variety of products, businesses indicated that they required a large range of inputs into their production processes.

Most businesses reported sourcing the majority of their inputs locally. However, in several cases businesses source their inputs internationally for reasons such as:

1. Lack of availability of the product locally: In some cases the required input was not available locally.
2. Price: In some cases businesses indicated that they were unable to source raw materials at a sufficiently competitive price locally.
3. Quality: In some case businesses reported that local suppliers were unable to meet their quality standards.

In most cases businesses indicated that their input costs were increasing because of the weakening rand. Businesses indicated that this was the case for both locally and internationally sourced inputs as prices were generally pegged to the dollar. Some of the businesses in development phase indicated that they expected their input costs to decrease with increased future production as they would be able to benefit from economies of scale.

## Location

Several of the businesses interviewed are located in the Pinetown/New Germany/Marian Ridge area. Other locations included Phoenix, Umhlanga (no manufacturing on site), Virginia airport and Everton (small scale manufacturing). Choice of location was most often dictated by availability of premises that fitted the requirements of the business in question. In some limited cases businesses cited strategic factors for their location such as being close to potential clients or access to labour. In one case proximity to facilities required for product testing was a key factor.

While most of the businesses only cited roads as significant to their operations, a few indicated that proximity to a port was helpful either as they received imports via the sea port, or that they used the sea port to export their product or hoped to use the sea port to export their product. Only one business had used rail freight and did not plan to use that form of transport again because of problems experienced.

One of the businesses was experiencing a high level of tenure insecurity in their current location because of changes in Municipal policy regarding their current location. This might ultimately lead to the relocation of the business to another municipality because of lack of other appropriate locations in eThekweni Municipality.

## Cooperation with other sector players

Several businesses felt that cooperation with other sector players was very important and were either actively involved in existing organisations that allowed them to work with other sector players, or they were actively involved in trying to establish new organisational structures to promote cooperation in the sector.

On the other hand other businesses did not feel that sector cooperation was particularly important for their business. Some of these businesses cited the small size of the existing sector as well as lack of other businesses in their area of interest.

## Prospects for the future

The businesses in development phase all expect to grow considerably in the near future. However, these businesses highlighted two major areas of constraint to their future growth. Firstly, several indicated they needed further investment or funding to substantially expand their operations. Secondly, others cited the need to secure large scale orders to maximise the use of their existing manufacturing facilities.

The future expectations of the well established businesses were mixed. While some were positive about the future and foresaw growth in sales, others were experiencing decreased sales in comparison to previous years and felt that the economic downturn was having an impact on their business. Some businesses also expressed concern that subsidies that indirectly supported their sales might ultimately be removed.

## Recommendations

There are a number of mechanisms that are typically used to support manufacturing and to promote further growth. To identify mechanisms that are most appropriate for supporting the local sustainable energy manufacturing sector in eThekweni Municipality a focus group meeting was convened with key officials from relevant eThekweni Municipality departments on the 26<sup>th</sup> November 2013.

Based on the input of officials the following list outlines potential support mechanisms that would be most viable for supporting the local sustainable energy sector in eThekweni Municipality:

1. **A well-networked and informed sector:** A well networked sector where local businesses are able to easily connect with both potential clients and suppliers and are informed on potential opportunities and general developments in the sector provides a good foundation for supporting sector growth. This service is already partially provided by the KSEF which is funded by eThekweni municipality. *To improve benefits for the manufacturing sector it is recommended that an active effort be made to invite all sustainable energy manufacturers to register as members of the forum and that KSEF host additional events that have show casing opportunities for local manufacturers.*
2. **Local procurement by government:** Government is already a major buyer of sustainable energy goods and services in the local economy. *To facilitate growth of local manufacture of sustainable energy goods it is recommended that government included provisions that favour local South African manufacturers of sustainable energy goods and services.*
3. **Access to finance for customers:** In the case of larger spend items (for instance Solar Water Heaters) access to finance for customers who can't afford the initial capital layout has the potential to unlock a large number of sales. *It is recommended that partnerships be developed with local banks to provide appropriate financing mechanisms for a suite of sustainable energy products.*
4. **Marketing Support:** Since the most sustainable energy products are poorly understood by potential customers business have to expend considerable effort explaining the general product category prior to being able to make a sale. eThekweni Municipality already provides marketing support for the Solar Water Heater industry through the Shisa Solar Programme. This programme markets the concept of Solar Water Heaters to eThekweni residents. Residents can request quotes through the programme and has a pre-screened panel of service providers are then provided with the opportunity to quote. *It is recommended that further marketing support mechanisms for other categories of products be considered such as a sustainable energy show room.*
5. **Business Support:** Emerging business can benefit from a range of support mechanisms such as access to legal and financial expertise, linkages to financing opportunities and general business advice. eThekweni Municipality has recently

commissioned a feasibility study for the establishment of an SMME incubator for the sustainable energy sector and *it recommended that the manufacturing sector be considered when finalising the incubator concept.*

6. **Reduced wheeling fee:** One mechanism of promoting local renewable energy generation is to allow renewable energy generators to supply customers with electricity through the local eThekweni Municipality grid. This practice is referred to as wheeling and depending on the fee charged for wheeling through the grid can promote the emergence of renewable energy generators who in turn may purchase sustainable energy products locally. *It is recommended that an investigation be conducted into the possibility of allowing wheeling at a reduced fee through the eThekweni grid for renewable energy projects.*

The following list outlines other support mechanisms that were considered by the focus group, but were not identified for implementation at a local level for a variety of reasons:

1. **Access to business finance:** There are a number of potential financing channels that exist in South Africa for business. These include some grant financing from government as well as various opportunities for loan financing. Considering the cost and complexity of creating an additional financing channel and the fact that other mechanisms already exist, it is not recommended that a new financing mechanism be created.
2. **Subsidies:** Subsidies are often used globally to promote various forms of local manufacturing. However considering the cost involved, this is not a viable form of support at a local level in eThekweni Municipality.
3. **Protection:** Many countries impose levies and other protectionist mechanisms to support their local manufacturing industries. These mechanisms are not viable to implement at a local level where there is no active control of import and export from the local area and as a result protection mechanisms are more appropriate for national implementation.
4. **Mandatory implementation of energy efficiency or renewable energy:** The new building regulations that limit the amount of electrical resistance heating that can be included in new buildings have acted to support the Solar Water Heating sector. While these kinds of regulations can be effective, mandatory requirements of this nature are more appropriate for implementation at national level.
5. **Sustainable Energy Development Zone:** Establishing a specific zone for a particular category of businesses where they receive benefits such as reduced rentals and services and also may benefit from the synergies of location next to similar industries is a common tool in promoting local manufacturing. At this stage in the development of the industry there appears to be limited benefits in providing a zone like this.

## Appendix A: Summary of Manufacturers Interviewed

### Solar PriMeg

Solar PriMeg is a close corporation 100% owned by Peter Moodley which was established in 1993. Solar PriMeg is a Level 1 BBBEE Contributor. Solar PriMeg manufactures a range of flat plate Solar Water Heating systems:

1. 200 litre and 300 litre high pressure systems: Including both indirect and direct systems.
2. 100 litre low pressure system
3. 100 litre semi-pressure system

In addition to manufacturing, Solar PriMeg also installs its own Solar Water heating systems, designs and installs Solar PV systems and sells and installs heat pump systems. Solar PriMeg generally sells its product directly to market, but does have agents in several towns in KwaZulu-Natal. Solar PriMeg currently concentrates its sales efforts on the KwaZulu-Natal market. However, Solar PriMeg has recently developed some indirect systems for sale in the inland market. While Solar PriMeg's current focus is on the South African market, in the past they exported products to Seychelles, Botswana and Angola.

Solar PriMeg employs approximately 30 people. Its key skill requirement is NQF Level 4 Solar Installer for staff involved in the installation of the system on site. Staff involved in the production itself are generally trained in-house.

(Moodley, M. *pers comm.*, 26th August 2013; Moodley, P. *pers comm.*, 26th August 2013).



Figure 1: Examples of flat plate solar water heating systems manufactured and installed by Solar PriMeg (Pictures: Solar PriMeg)

## ARTsolar

ARTsolar is a new entity that started manufacturing in 2012. It is a Pty (Ltd) with 98% South Africa ownership. ARTsolar is a Level 3 BBBEE Contributor. ARTsolar ART manufactures Solar PV modules and has three core ranges:

1. Mono Standard Series (230 - 250 Wp): This series comes with standard silver aluminium frames and a variation in back sheets: white, black or clear.
2. ART Mono Black Series (230 - 250 Wp): This series comes with black, anodised framing and also has a variation in back sheets; white, black, or clear.
3. ART Ilanga Series: The modules in this series are transparent, allowing light to penetrate through it. The module is also frameless. The placing of the cells ultimately determines the final transparency and output of the module.

ARTsolar's primary target market is the South African Renewable Energy Independent Power Producer Procurement Programme (REIPPPP). It also expects a small portion of sales to come from the industrial, commercial and residential markets in South Africa. In the longer term ARTsolar plans to sell to the broader South African region. For large scale installations in the REIPPPP ARTsolar sells directly to the entities responsible for the engineering, procurement and construction of the installations. In the case of industrial, commercial and residential installations, sales will be made via distributors, bigger installers and wholesalers.

If operating at full production capacity ARTsolar expects to employ approximately 100 people. Its key skill requirement for staff in the production process is literacy and numeracy. Staff are generally trained in-house.

(Lange, *pers comm.*, 23rd August 2013).



Figure 2: An ARTsolar PV panel in production; a completed ARTsolar PV panel (Pictures: ARTsolar)

## Mod-U-Flow

Mod-U-Flow is a close corporation that is owned by three partners who all work in the company. It was established in 1999 and is a Level 4 BBBEE Contributor.

Mod-U-Flow manufactures the Modular Mod-u-Flow heat exchanger. This is a patented product and its unique design feature is an atmospheric gap that prevents the possibility of cross contamination. The design of the Mod-U-Flow heat exchanger is adapted to the specific needs of the client.

The majority of Mod-U-Flow's sales are local and its primary market is the mining sector. Mod-U-Flow exports about 20% of its production and has sold its product in a number of African countries and as far afield as Pakistan and United Kingdom. Mod-U-Flow heat exchangers are popular with oil rigs in the North Sea because the design prevents the possibility of steam contaminating oil.

Mod-U-Flow has nine staff members. Staff qualifications include a BTech Degree, qualified fitter and turner, qualified millwright and qualified machinist.

(Walker, *pers comm.*, 22nd August 2013).



Figure 3: Mod-U-Flow Heat Exchanger (Picture: Amanda Botes)

## Natural Balance

Natural Balance was established in 2007. It is a Pty (Ltd) with 100% South African ownership. Natural Balance is a Level 4 BBBEE Contributor.

Natural Balance manufactures a heat retention cooker with the trade marked name of Wonderbag. The Wonderbag is supplied in three sizes: baby, medium, catering. The manufacturing of the Wonderbag is not done in-house by Natural Balance but rather sub-contracted to several different entities most of which are located in the northern areas of Durban.

The Wonderbag is sold throughout South Africa. In addition the Wonderbag is exported to Kenya, Zimbabwe and Botswana as well as several countries in the European Union. Wonderbag also has a small presence in Australia and will shortly be initiating sales in the United States. Natural Balance makes some sales direct via its website, however it has a large network of distributors and is also expanding its sales through placement in retail stores.

Wonderbag has eleven employees. Manufacturing is outsourced and the number of manufacturing jobs created varies depending on orders.

(de Bufanos, *pers comm.*, 21st August 2013; Harvey, *pers comm.*, 21st August 2013).



Figure 4: Wonderbags in production; examples of the Wonderbag (Pictures: Natural Balance)

## Rocket Works

Rocket Works is a new entity that was established in 2012. It is a Pty (Ltd) with two South African owners. Rocket Works is a Level 4 BBBEE Contributor.

Rocket Works manufactures the Rocket Stove. The main feature of this wood fuelled cooking stove is the high level of combustion efficiency that it achieves. The stove is 90% more efficient than a normal wood fire and has very low emission levels. Rocket Works also manufactures a number of attachments for the stove such as a bread oven, a skillet and a gel fuel insert. Since Rocket Works is still in a start-up phase, the manufacturing of the Rocket Stove is not done in-house. Instead Rocket Works has partnered with two local manufacturers to make the stoves.

Rocket Works is targeting sales in developing countries where there is a need to replace traditional methods of cooking with more efficient methods that reduce smoke exposure. Since the retail price of the Rocket Stove (R399 incl VAT) may be unaffordable to the core target market, Rocket Works is looking for ways to secure donor funding to subsidize the sale of the product. While Rocket Works intends for its primary sales to be exported, it has sold stoves in the Eastern Cape province of South Africa and the stove is currently retailed by the One Stop chain in the Eastern Cape. Rocket Stoves can also be bought direct from Rocket Works via its website. The retail price includes an eco-friendly recycled truck tube bag and free shipping nationwide.

If operating at full production capacity Rocket Works expects to employ over 40 people. Staff would be trained in-house.

(Padt, *pers comm.*, 26th August, 2013).



Figure 5: Rocket Stove being used to fry mielies (Picture: Rocket Works).

## Solar Beam

Solar Beam was established in 1978 by Graham Mundy. It is a Pty (Ltd) which is not BBBEE rated. . Solar Beam is a Level 4 BBBEE Contributor.

Solar Beam manufactures flat plate Solar Water Heating systems. Its main products are 200 and 300 litres high pressure for the domestic market. Solar Beam also manufactures low pressure systems and has recently registered a design for a new high pressure flat plate panel that is frost resistant. Solar Beam also designs and installs industrial scale systems. Solar Beam installs its own Solar Water heating systems.

Solar Beam sells its own product directly to market and does not make use of agents. Solar Beam mainly supplies to the KwaZulu-Natal area. In the past Solar Beam experimented with supplying to other areas in South Africa. Since solar water heating installations are highly technical Solar Beam decided to focus on the KZN market where the quality of installation can be properly controlled. While Solar Beam has exported its product in the past, it does not currently export any product. Solar Beam is however currently making some sample products for potential export.

Solar Beam employs approximately 20 people. For installation of its product Solar Beam requires staff with the appropriate NQF qualification. Production staff are trained in-house.

(Mundy, *pers comm.*, 19th August 2013).



**Figure 6: The new frost resistant flat plate solar water heater designed by Solar Beam (Picture: Margaret McKenzie)**

## Adept Airmotive

Adept Airmotive is an innovative manufacturing company that produces a range of light aircraft engines for general aviation. It is a Pty (Ltd) company that began in 2002 and has a number of South African shareholders including The Technology Innovation Agency. Adept Airmotive is a Level 4 BEE contributor.

The engines produced are 250 to 350 hp and are the most technologically advanced in their category. Other significant features are:

1. Approximately 40% more fuel efficient than competitors.
2. Lifecycle costs approximately 60% lower than competitors.
3. Ability to run on multiple fuels: Standard fuel, lead free fuel and bioethanol.

Adept Airmotives will target sales regions of the USA, Australasia, Middle and Far East, Eastern Europe and China and expects about 85 – 90% of sales to be export sales. The initial target is non-type certified aircrafts however Adept Airmotives is in the process of gaining certification to allow it to sell to the certified sector as well. The potential size of new aircraft engine sales is difficult to gauge, however, there are a quarter of a million light aircraft in existence to which Adept Airmotive has the opportunity to sell engines to. Adept Airmotive sells direct to buyers but is currently in the process of securing a USA distributor and has plans to secure distributors in other countries. In the medium term the company's aim is to sell between 50 and 100 units per year.

Adept Airmotives employs 10 people with broad spectrum skills, some have B-Tech Degrees and others self-taught. Virtual Prototyping is a key skill. They hope to have 20 people employed in the next 18 months and 50 people in the next 5 years.

(Schults, *pers comm.*, 17th September 2013).

## Jabulani Holdings

Jabulani Holdings is a PTY (Ltd) company solely owned by Doug Cunningham and set up in 2008. Jabulani Holdings is a Level 4 BEE contributor.

Jabulani Holdings aim is to manufacture versatile, modular flat plate Solar Water Heating systems of 25 litre up to 4000 litre in size.

Jabulani Holdings is still in the fabrication stage and intends to focus on the local KwaZulu-Natal market initially with options of direct and or indirect sales efforts.

Jabulani Holdings currently employs 5 people. Their business plan includes a mixture of skilled and unskilled labour with training to be conducted in-house.

(Cunningham, *pers comm.*, 19th September 2013.)

## Khwezi Oils Biodiesel

Khwezi Oils Biodiesel started manufacturing biodiesel in 2011 and is solely owned by Brian Mpono. It has a Level 3 BBBEE rating.

Khwezi Oils Biodiesel sells biodiesel directly to construction companies and trucks and busses in KwaZulu-Natal and the Eastern Cape and is now extending its offering to Johannesburg. Khwezi Oils Biodiesel is not planning to export their biodiesel as it is specifically produced to offer a locally manufactured alternative to imported diesel. Khwezi Oils Biodiesel has manufactured 420,000 litres of biodiesel over the last two years.

Khwezi Oils Biodiesel has one employee and subcontracts out the production that employs approximately four people. All their training is done through in-house training courses.

Khwezi Oils is in the process of investing in a larger plant in order to expand its capacity to service the market and hopes to open the first biodiesel truck stop in South Africa in the near future.

(Mpono., *pers comm.*, 26 September 2013)

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