



# Green Innovation for Sustainability

Growing small businesses with great ideas

The GCIP-SA – a fully subsidised entrepreneurship accelerator programme – helps entrepreneurs de-risk their businesses and develop bankable business models and practices, and facilitates access to an international network of potential sponsors and partners.

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## Growing small businesses with great ideas



## FOREWORD

by the Minister of Science and Technology



International scientific assessments make it increasingly evident that the world cannot achieve sustainable economic growth without significant innovation in both the supply and demand sides of the market ([www.unep.org](http://www.unep.org)).

In line with this global sentiment, the South African Government has made clear its commitment to adopting a greener, more sustainable development path in several national strategies implemented by the Presidency as well as government departments, in partnership with stakeholders in the National System of Innovation (NSI).

It is well understood that while green technologies have the potential to stimulate economic growth, create new job opportunities, and mitigate ecological risks; a parallel thrust is essential to establish enablers to address the innovation chasm between research results and socio-economic outcomes.

The progress made during the past four years has validated the GCIP-SA as a viable mechanism to contribute to South Africa's national development goals, with a total of 102 Cleantech entrepreneurs having been assisted in getting their businesses investment ready through the GCIP-SA's intensive training and mentoring programme.

I would like to express my gratitude to our international partners for their role in the success of the programme, namely the United Nations Industrial Development Organization (UNIDO), for initiating and co-implementing the programme, the Global Environment Facility (GEF), for their generous funding, and the Cleantech Open, who provided technical support. The Technology Innovation Agency (TIA), under guidance of the CEO, Mr Barlow Manilal, also did a sterling job in the co-implementation and hosting of the GCIP-SA in South Africa. I look forward to our continued collaboration after the full integration of the programme into TIA as from January 2018.

In conclusion, I would like to wish all the participants and alumni of the programme well on their journeys going forward. I support the ongoing efforts by the partners to enable these entrepreneurs to reach commercialization and maximize their ability to create jobs, generate wealth and reduce Greenhouse Gas emissions through the successful adoption of their clean technology innovations nationally and globally.

*Naledi Pandor*

**Mrs Naledi Pandor**  
Minister of Science and Technology

“ This cleantech programme has showcased an innovative nation. Innovation adds momentum to the structural economic change that is needed for economic growth, job creation and an improved quality of life for us all. ”





## MESSAGES FROM UNIDO

### Project Developer and International Implementer

In line with its mandate of promoting Inclusive and Sustainable Industrial Development, UNIDO has been a catalyst for the establishment of a national Clean Technology Innovation Ecosystem in South Africa. Under the GCIP-SA Project we have aimed to assist on-going national objectives to firstly strengthen the development of supportive policy and regulatory frameworks that will better foster and support innovation; secondly, build institutional capacity as well as most importantly, the capacity of our participating entrepreneurs; and finally, together with TIA, we have sought to increase access to finance for our Project Entrepreneurial Teams.

UNIDO began the Cleantech journey with its South African partners in 2011 as part of the "Greening the COP" project, with the development of a pilot Clean Technology Innovation Project funded by the Global Environment Facility (GEF). Based on the success of this pilot project, the GEF requested UNIDO and our national partners to develop a full-scale project. The result was the launch of the "Global Cleantech Innovation Programme for SMEs in South Africa (GCIP-SA)" in April 2014.

The Project has been a great success. Over the past four years, it has worked with entrepreneurial teams from all nine provinces in South Africa,

with a total of 102 CleanTech entrepreneurs being directly supported through the GCIP-SA's Business Accelerator Process. In addition to the entrepreneurial teams, a dedicated cadre of volunteer mentors and independent judging panelists were also trained to support the entrepreneurs in the development of their business models. Partnerships were established with private and public institutions to provide expert advice to the entrepreneurs in key areas such as Intellectual Property protection, product development, and financing.

Building on the success and lessons learned through the GCIP-SA Project, the GEF and UNIDO developed a global flagship programme to promote Cleantech innovations and Cleantech entrepreneurs around the world. The GEF/UNIDO portfolio now consists of GCIP programmes in seven other countries.

Within the global programme, the GCIP-SA Project remains one of the best performers in terms of entrepreneurial innovations and the successful development of their business models. The innovative spirit and capacity of South Africa's entrepreneurs has been repeatedly recognized at the Cleantech Open Global Forums, which are



UNIDO is committed to assisting the Government of South Africa and the Technology Innovation Agency (TIA) to find, foster, and connect South African innovators, inventors and entrepreneurs that have the drive to develop innovative, practical and commercially viable ways to address sustainable development issues in South Africa and beyond.

held each year in San Francisco, California. In 2015, the national GCIP-SA winner “Ekasi Energy” was selected as the overall Cleantech Open Global winner. In 2016 “Baoberry”, the national South African winner, was one of two overall Cleantech Open Global runner-up teams, where our South African runner-up “Thevia” also won the overall Cleantech Open Global Green Buildings category.

All of this would not have been possible without the partnership with the South African government through the Department of Science and Technology, and the Department of Trade and Industry. The GCIP-SA Project was also made possible by the excellent work of TIA, our national counterpart and executor. We would also like to express our gratitude to our international partners; firstly – the GEF for their generous funding; and secondly, the Cleantech Open for their excellent and in-depth entrepreneurial training and mentoring services.

Lastly, UNIDO offers a special thank you to each entrepreneur who undertook the GCIP-SA journey with us over the past four years. We are proud of those that we have assisted in their efforts to develop game-changing Cleantech products and services for South Africa and the world.



**Tareq Emtairah**, Director: Department of Energy, UNIDO

UNIDO congratulates the Technology Innovation Agency (TIA), its national counterpart, on the good execution of the GCIP SA Project over four years, during which a strong sense of national ownership was developed through an active contribution by skillful South African human resources and efficient management of the project funds allocated by the Global Environment Facility (GEF).



The emphasis on the growing importance of Cleantech innovations required to reduce carbon intensity in buildings and construction processes, is all in line with Sustainable Development Goal 9 (SDG9) “Innovation, Industry and Infrastructure”. The GCIP-SA Project also addressed other related SDG’s that focus on Water, Sustainable Cities, and Cleaner Production (respectively SDGs 6, 11, 12).

The GCIP SA initiative comes in line with UNIDO interventions in Southern Africa addressing Renewable Energy and Energy Efficiency on a wider regional scale. The “South African Development Community (SADC) Centre for Renewable Energy and Energy Efficiency (SACREEE)” is a prime example of South-South Cooperation illustrating UNIDO’s efforts to share successful South African methodologies in wider technical cooperation activities throughout the SADC region.

UNIDO looks forward to further successful partnerships of this nature, and expresses its appreciation for the support provided by the South African Government, and all stakeholders involved in this success story.



**Khaled El Mekwad**,  
UNIDO Representative and Head of South Africa Regional Office



## MESSAGE FROM THE TIA CHIEF EXECUTIVE OFFICER

### National Implementer and Host

We believe our greatest opportunities lie in our greatest challenges. These opportunities to do things differently allow us to innovate for a sustainable future. It is in this principle that our association with UNIDO in the implementation of the GCIP-SA reflects a meeting of minds and an absolute alignment of purpose.

TIA's mandate is to use South Africa's science and technology base to develop new industries, create sustainable jobs and help diversify the economy away from commodity exports towards knowledge-based industries equipped to address modern global challenges. The premise is simple: Successful innovations, innovators and entrepreneurs create industries, jobs, and contribute to better living conditions, a sustainable environment and economic growth.

The decision by UNIDO to pilot a Cleantech programme in South Africa in 2011, at the time in collaboration with the National Cleaner Production Centre of South Africa (NCPC-SA), showed real strategic foresight. Since the launch of the fully fledged GCIP-SA in 2014, it has been TIA's privilege to host the programme and collaborate closely with UNIDO on its implementation in South Africa, with funding from GEF.

By fostering clean technology solutions and innovative entrepreneurs, the GCIP-SA supports

delivery on the country's international commitments to reduce carbon emissions, including those set out by COP 21. Moreover, the GCIP-SA's training and mentorship programme for participating innovators and entrepreneurs is in line with the National Development Plan's (NDP2030) commitment to higher levels of skills and innovation capacity needed to move to a low-carbon economy.

The GCIP-SA has been the perfect case study of a successful international partnership, combining local and international expertise in support of the country's national priorities. We are delighted to have the programme under our wing, and look forward to our continued collaboration with UNIDO and the broader GCIP-SA stakeholder base into the future.

This book gives but a taste of the many achievements of the programme over the past four years, with evidence of excellence accompanying every story.

I hope you will be inspired to join us in our ongoing efforts to nurture and advance our country's innovators and entrepreneurs and bring about effective change to the economy of South Africa, the environment and ultimately to the lives of all its people.

**Barlow Manilal**, Chief Executive Officer



## MESSAGE FROM THE PRINCIPAL FUNDER

*David E Rodgers,  
Senior Climate Change Specialist,  
Global Environment Facility*



Entrepreneurs have a vital role to play in developing breakthrough technology innovations that can control, reduce or prevent greenhouse gas emissions and other environmental challenges. Since first meeting innovative South African cleantech entrepreneurs during the GEF-supported South African Cleantech Competition at COP17 in Durban, we have been overwhelmed with the ingenuity, dedication and determination of innovators from across the country.

The success of GCIP-South Africa over the last four years has highlighted the tremendous technical and entrepreneurial talent in South Africa and its potential to create new technologies and business models that can deliver significant environmental benefits and jobs. I would like to thank our colleagues in the Departments of Science and Technology, Trade and Industry, Energy and Environmental Affairs for their support of the GCIP-South Africa program over the last 4 years. In particular I would like to thank the Technology Innovation Agency (TIA), UNIDO, the Cleantech Open and the many national partners for making GCIP-South Africa such a success.

We look forward to the growth of GCIP-South Africa in 2018 and the potential to bring this catalytic program to other SADC countries and Africa more broadly in the years to come.



## COMMENTS BY KEY STAKEHOLDERS



**Kevin Braithwaite**, Cleantech Open



Over the last 4 years, I have been struck by the diversity of innovative solutions that have been identified, celebrated and supported by GCIP-South Africa. This has ranged from solutions focused on specific communities in South Africa to solutions with a truly global potential.

We have seen everything from innovative low-tech solutions to those that are on the cutting edge of science. All have an important role to play in addressing the key environmental, energy and economic challenges faced by South Africa and

the world at large. It has been a privilege to be part of the GCIP-South Africa journey over the last 4 years and to work with our friends at UNIDO and the GEF since 2011 to support South African cleantech entrepreneurs.

We look forward to the growth of GCIP-South Africa under the leadership of TIA both nationally and regionally. We will continue to help connect solutions from the very best South African cleantech entrepreneurs to customers, partners and investors around the globe.



I have been inspired by the real sense of community and collaboration within the growing GCIP-South Africa network and the desire from entrepreneurial alumni, mentors and partners to make a real difference.



**Gerhard Fourie,**  
Department of Trade and Industry

“ Policy developers are becoming increasingly aware of the potential threats that global sustainability challenges pose to South African industries. The ambitious Paris Agreement adopted on 12 December 2015 was a major turning point in the global fight against climate change, sending a clear signal to global markets that governments and investors have reached a point of no return and have accepted that a move away from business-as-usual, is not a preference as much as a matter of survival. Evidence suggests that business has also come to the realisation that this “greener” reality also creates many new commercial opportunities and many are already reaping the benefits of pro-active investments in innovative new green technologies and services.

These new technologies and methodologies are playing a critical role in enabling adaptation and mitigation at the industry and corporate level at a much faster rate than previously thought possible and business models developed in this new paradigm hold the potential to uproot unsustainable practices and even invent entirely new industries. ”



**Henry Roman,**  
Department of Science and Technology

“ This commemorative book on the GCIP in South Africa is important as there have been valuable lessons learnt since the inception of the programme in 2014 that should be made available to the country and, more importantly, policy makers. The integration of this programme into TIA, demonstrates South Africa’s support and commitment to transitioning to a greener more inclusive economy. ”





GCIP-SA team, 2017



2017 Semi-finalists

## THE GCIP-SA JOURNEY: 2014 - 2017



The GCIP has been a life-changing experience.

Since the pilot project in 2011 to its inception and implementation in 2014, UNIDO, TIA and GEF have played a significant role in ensuring that the vital resources and know-how were available to roll out this impactful programme.

Every year we have been able to reach more potential applicants by circulating the Call for Applications in more provinces. The lesson learned has been to advertise widely and use as many networks as possible to reach out. Making each year's programme a memorable experience has ensured that beneficiaries had a good news story to share by word of mouth and in the press. We have also had an excellent response from various universities to our Call and this bodes

well for unearthing young innovators and diversifying the demographics of our applicants.

In selecting the annual cohort of participants, the internal competency and teamwork of TIA colleagues have been instrumental in making sure that the right teams were on the programme.

Our knowledge partner Cleantech Open has truly been exceptional. Through their training, mentorship, extensive experience in business model methodology for start-ups and weekly webinars, both the participants and staff have been capacitated over the four-month training exercise. With the guidance of skilled local mentors, the teams were taught to "fail fast" by validating their assumptions.

South Africans share! Who would have thought that over the four years more than 50 unpaid volunteers

would give unselfishly of their time to assist these innovators?

Knowledgeable mentors and judges have guided these fledgling entrepreneurs towards more robust business models, and in some cases have formed lifelong personal, professional and business relationships in the process. This is the true value of the programme – a cleantech innovation community.

As consistent private sector partners, *Spoor & Fisher* and *Skeg Product Development* have been excellent in providing the teams with insight into the important areas of Intellectual Property and Product Development. Our Business Clinics have given them the opportunity to freely consult with these companies. Entrepreneurs need support, and I would like to thank *Spoor & Fisher*, *Skeg* and others for showing it.



Mr Tiep Khac Nguyen, UNIDO



Gerswynn McKuur (GCIP-SA), Muhammed Sayed (TIA), Claudia Giacobelli (UNIDO) and Tsakani Mthombeni (TIA) at the launch of the GCIP-SA in 2014

Our cohort of alumni has demonstrated the impact of the programme by excelling on other local and international platforms, gaining recognition and further support and securing and funding. Dave Lello (Ekasi Energy), Yolandi Schoeman (Baoberry) and Martin Ackerman (Thevia) have all been top performers at the Cleantech Open Global Forum

in San Francisco, for example. We are proud to have contributed to their success. We know that more will have to be done to help commercialize all the amazing products we have seen and I am looking forward to future partnerships and initiatives to make this a reality.

I am grateful to have worked with a humble, dynamic, hardworking and passionate team. A team that has changed over the years but a team that has always focused on making the GCIP the best experience for the beneficiaries.

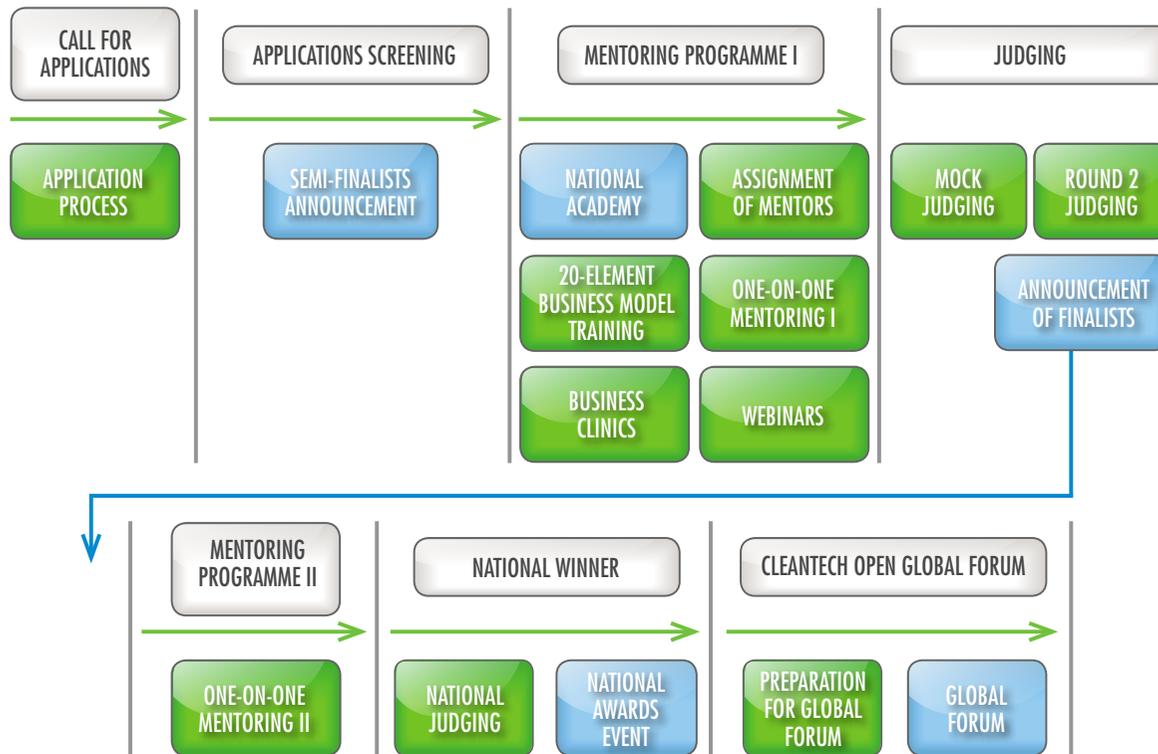
To James New, Tiep Khac Nguyen, Claudia Giacobelli, Given Madhlophe, Fatima Sibuyi, Constance Mashabela, Petro de Wet, Courtney Gehle, Nikola Niebuhr and Conrad Kassier – thank you for making this project a legacy that our partners and innovators are proud of and can build on!

### GCIP-SA Semi-finalists, 2014 - 2017

	2014	% of total	2015	% of total	2016	% of total	2017	% of total
Total	23		28		26		25	
Female	1	4%	4	14%	5	19%	8	32%
Black	5	22%	8	29%	5	19%	8	32%
Youth	6	26%	7	25%	7	27%	10	40%

Gerswynn McKuur,  
National Project Manager, GCIP-SA

# THE GCIP-SA PROCESS



**James New,**  
Industrial Development Officer,  
Energy Branch, UNIDO

It has been a privilege for me to work with the entire South African GCIP-SA Team, our Government counterparts and our participating entrepreneurs. I sincerely feel that the Project has achieved a great deal and I also feel that TIA's national execution of the Project sets a gold standard for how such projects should be delivered. I have found the GCIP-SA Project highly educational for me personally, both from the entrepreneurial training provided by the CleanTech Open and by the range and technical quality of the products from our South African participants.



## SMALL BEGINNINGS

# 2011

In 2011, the Government of South Africa, with the support of UNIDO and GEF, piloted the first Clean Technology Competition as part of the 'Greening the COP17' project. Implemented by the National Cleaner Production Centre of South Africa (NCPC-SA), the relevance of "2011 SA Cleantech" was officially recognized at the Gala and Awards Dinner by the Ministers of Science and Technology, Trade and Industry, and Energy. The event was also attended by the UNIDO Director General and the Chief Executive Officer of GEF. Following the event, these key stakeholders all confirmed their interest in this initiative and expressed their commitment to ensuring that the Cleantech programme becomes a sustainable legacy project in South Africa.

Twenty-four semi-finalist companies were identified for support through 2011 SA Cleantech. The initiative succeeded in raising awareness of clean technology, not only amongst the 300 high-ranking guests who attended the Gala and Awards event, but amongst SMEs and the public at large.

*Top right: Minister Rob Davies (the dti) and GEF CEO at the time Madame Monique Barbut, with Ministers Naledi Pandor (DST and Dipuo Peters (Energy) at the 2011 awards event.*

*Right: The 2011 finalists at the awards event at COP17 in Durban.*



## PROFILES

# 2014



## WINNER CLEAR SKY ENERGY led by Mark Booth

**INNOVATION:** Waste-to-energy technology

**DESCRIPTION:**

CSE's waste-to-energy plants combust carbonaceous waste to produce energy, diverting it from landfills.

**THE PROBLEM:**

The majority of incinerators in SA are now non-compliant with new air emissions legislation based on EU standards. The medical industry is particularly affected due to harmful emissions.

**THE STORY SO FAR:**

- CSE has international patents for the manufacture and development of fully certified waste-to-energy technologies and solutions
- Its breakthrough technology facilitates complete combustion at 99.8% through a counter flow vortex combustion chambers named the 'afterburner'

- It generates temperatures up to 1,500°C in the core of the chamber with minimal primary heat input for the supply of waste to energy plants that are cost-effective, highly-efficient, have small footprints and are fully emissions compliant

**WHAT'S NEXT?**

CSE is in discussions with European waste companies to license the core technology for product development to complement their current technology, after which it can be taken to market in Europe.

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**"The GCIP was invaluable in understanding how to de-risk a business and successfully take a new product to market."** Mark Booth

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The 2014 finalists with Ms Zanele kaMagwaza-Msibi, Deputy Minister of Science and Technology.

## RUNNERS-UP

### WHC (PTY) LTD

led by Paseka Lesolang

**INNOVATION:** WHC Leak-Less Valve

**DESCRIPTION:**

The WHC Leak-Less Valve is a water control device that can save 70% of water currently lost through toilet leaks, and saves the money that is used to pay for this water.

**THE PROBLEM:**

The toilet is the single largest water consumer in the house, accounting for ~28% of overall usage. A leaking toilet can waste 30 litres to 700 litres of water per day.

**THE STORY SO FAR:**

- Created models of the product to cater for 75% of the market (up from 30% in 2014)
- Developed skills and created jobs for 26 people
- Converted the interest of both public and private sector into cash
- Saved ~6 072 300 litres of water {equivalent to 2.5 Olympic swimming pools} within 6 months through the installation of 865 WHC Leak-Less Valves in a community

**WHAT'S NEXT?**

- Convert the public and private sector interest into cash sales
- Create more water jobs
- Save more water
- Save more money
- Scale the impact

### LIGHTSPERSE

led by Desmond Seekola

**INNOVATION:** Lightsperse Metering

**DESCRIPTION:**

Efficiently measuring residential and business water usage and identifying possible water leakages in using a patented technology solution that is affordable for mass deployment.

**THE PROBLEM:**

Municipality readings are often inaccurate, resulting in consumers being overcharged.

**THE STORY SO FAR:**

- Employment created for an additional engineer and technician for product development
- Granted a patent for Europe and a full US patent in 2017
- These important milestones contribute to SA intellectual property in the field of water telemetry and is important as water is a critical resource but lacks local R&D

**WHAT'S NEXT?**

SABS and pilot testing.

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**“GCIP-SA is important for those with a technological background who have a solution but don’t understand the market and the dynamics to make it a successful product and business.”** Desmond Seekola

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### Collaboration with Massmart announced:

“MassMart is committed to supporting and developing local manufacturers. This is why we are investing in **Paseka Lesolang**, Founder of the WHC Leak-Less Valve™. He is an innovator and partner in the Massmart Supplier Development Programme; just another way we create opportunities to prosper.”



### CHECKLIST:

- ✓ First deployment of FAABulous stoves in Egoli and Enkanini informal settlements in Western Cape in 2016
- ✓ All devices are portable and suitable for indoor or outdoor use
- ✓ Modular and recyclable components

## PROFILES

# 2015

### WINNER EKASI ENERGY led by Dave Lello

**INNOVATION:** FAABulous biomass portable stove

**DESCRIPTION:**

FAABulous micro-gasifier stove that burns biomass efficiently with the help of an electrically-driven fan. It costs less to run than other cooking methods and reduces smoke and carbon monoxide fumes normally linked with burning biomass by over 90%.

**THE PROBLEM:**

More than 600 million people in Africa still cook on fire every day because they do not have and/or cannot afford electricity. Smoke from these fires causes many deaths, ailments and problems for children.

**THE STORY SO FAR:**

- FAABulous stoves burn compressed wood pellets and has a load capacity of 650 grams
- At full power it uses 500g of fuel per hour, providing 2 kW of heating
- At a cost of R4 per kg, pellets provide heating at less than R1 per kW. This is less than paraffin, LP Gas or Eskom Power

**CHALLENGES**

Pellets are not freely available in South Africa. Ekasi therefore broadened its business focus to

include the manufacturing of fuel, which will include empowering local communities to identify waste resources and to convert bio-waste into an affordable cooking/heating fuel!

**OPPORTUNITY**

Pellets retail for over 20X the value of bio-waste (such as Saw Dust) and the conversion of waste to fuel offers a sustainable local value chain that meets triple bottom line objectives:

- Provides households with affordable clean cooking alternatives
- Converts bio-waste into usable fuel and reduces smoke pollution and GHG emissions.
- Creates a fuel value chain that creates jobs in the local economy

**WHAT'S NEXT?**

Ekasi Energy dual product offering is to offer both mini pellet manufacturing plants as well as gasifier stoves creates a sustainable business model. The fuel revenue exceeds stove revenue by over eight times, crating a much larger market.

We are planning our 1st pilot pellet plant in Wellington outside Cape Town and will be working with the local community to use alien tree vegetation which threatens water security as the raw bio-waste input.



The 2015 finalists with Minister Naledi Pandor.

**“Over the last two years, I had to pivot and change the business model three times. While this has cost time, it has saved many thousands of Rands on potentially flawed business models...**

**The business toolkit provided during GCIP has provided me the basis to quickly determine the target market’s pain and need, ... and how to avoid costly mistakes by pivoting timeously.”** Dave Lello

## RUNNER-UP

### CARBOTECT™

Led by Dr Robin Kirkpatrick

**INNOVATION:** WHC Leak-Less Valve

**DESCRIPTION:**

Carbotect™ is rapid and reliable water diagnostic tool to verify cleaning efficiency in food, beverage, pharma and water treatment facilities and to proactively quality assure both product and process water before microbial contamination is detected.

**THE PROBLEM:**

Water quality and process and equipment hygiene in high risk food and beverage processing remains a persistent threat to consumer health, company viability and profitability. Current quality assurance

measures either require long lead times for micro-biological results to become available or near term outcomes require costly infrastructure, personnel and consumable inputs.

**THE STORY SO FAR:**

- Carbotect™ is a user friendly, cost effective, rapid and reliable colour-based diagnostic tool to quality assure cleaning efficacy as well as the sanitary status of both process and product water
- The technology:
  - is suitable for all levels of operator skills and is appropriate across a diverse array of high-risk consumer industries
  - has been independently validated by a multinational brewery group and is approved for use in the global packaging environment
  - has consistently displayed repeatable sensitivity to ultra-low levels of organic contaminants and is ideally placed as a proactive or sentinel indicator of incipient microbial contamination.

**WHAT’S NEXT?**

- Formal commercial launch to selected industry sectors planned for 2018
- Marketing and distribution partnerships being explored for the UK, Europe and the USA.

**CHECKLIST:**

- ✓ Patent and Trade Mark protected (patent applications granted in SA and the USA)
- ✓ Winner of 2016 GreenPitch and Sustainability Summit Award
- ✓ Packaging strategically improved for extended shelf-life to support expanded geographic supply

**NOTE: NO SPACE FOR LAST BULLET IN CHECKLIST**

## PROFILES

# 2015

### RUNNER-UP

#### ECO-V led by André Nel

**INNOVATION:** GreenTower Microgrids

**DESCRIPTION:**

GreenTower Microgrids affordably provide electricity, fresh water, hot water and sanitation from renewable resources for self-sustainable communities

**THE PROBLEM:**

In South Africa around 7 million electric water heaters consume more than 10GW (or one-third) of total available grid capacity. Low-income housing projects are particularly affected by high energy costs.

**CHECKLIST:**

- ✓ Technology validated (University of Pretoria)
- ✓ Prototype tested at a hospital (2014)
- ✓ Patent registered
- ✓ Commercial pilots running since 2015



*GreenTower sustainable community solar and vertical axis wind turbine.*

**THE SOLUTION:**

The impact of GreenTower Microgrids are illustrated by the following pilot projects:

- GreenTower Microgrids will reduce annual electricity bills by 39% and save 1,300 kilolitres of water annually for a home for the elderly with 80 residents
- Greentower Microgrids use solar power for recycling 40,000 liters of greywater per day to supply potable water for a corporate headquarters in Cape Town

**PIVOT:**

GreenTower has changed from household rooftop systems to Microgrids for property developers, corporates, retirement homes and low-income housing.

**WHAT'S NEXT?**

A South African patent has been registered. Eco-V is working on improved software to manage GreenTower Microgrids and provide for industrial scale applications, and also to integrate with wind turbines. Future markets include student accommodation, shopping malls and the hospitality sector.

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**“Being exposed to entrepreneurs from other developing countries during the San Francisco trip helped me understand the challenges of disruptive technologies while providing motivation to persevere through difficulties.”** André Nel

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## FEMALE-LED TEAM

### ZINGBUG led by Santa Scheepers

**INNOVATION:** ZingCo Electric Vehicle Project

**DESCRIPTION:**

Locally assemble off-road electric bikes and gradually increase manufacturing and local content to produce a local electric bike.

**THE PROBLEM:**

Pollution caused by fuel-powered bikes is hazardous to the environment and people's health. Fuel is also a costly and inefficient form of energy.

**THE STORY SO FAR:**

- Journey started with converted electric Beetle; included participation in 2015 Sasol Solar Challenge. Pivoted to electric bikes due to cost and legal challenges with retrofitted vehicles in South Africa
- Ran an electric bike rental pilot in Alexandra/Sandton area, but frustrated by slow pace of legislative changes required to legalise use of eco-mobility vehicles on SA roads
- Led to the selection of a robust electric scooter suitable for off-road conditions to be assembled locally. Plant expected to be up and running soon.

**WHAT'S NEXT?**

- SA market potential is R450-million, including road legal bikes. Export potential exceeds R1-billion.
- Diversify product range to include electric mobility vehicles and quad bikes.

## SOCIAL IMPACT

### ZUKA led by Sizwe Mnamatha

**INNOVATION:** Zuka vermicomposting biotechnology

**DESCRIPTION:**

Waste collected from communities is fed to red wriggler worms, kept in worm factories. The worms eat the waste as it decomposes, and their urine – called leachate – is harvested. This can be used by farmers as a powerful fertilizer, and also acts as an organic pest repellent.

**THE PROBLEM:**

Unemployment is high in rural areas. Worm farms can create employment, and the organic pest repellent is safer than toxic pesticide.

**THE STORY SO FAR:**

- Small-scale testing proven to repel ants, aphids and other worms
- Contains phosphates and nitrates for high-quality fertilizer
- Being sold at farmers' co-operatives

**WHAT'S NEXT?**

Zuka is currently in talks with investors to not only to explore funding opportunities, but also to access their knowledge and expertise to facilitate expansion of the product across SA and internationally.

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**“My involvement in GCIP-SA has given me exposure to a network of well-connected people. I am standing among giants, and it is thanks to GCIP-SA.”** Sizwe Mnamatha

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## YOUTH-LED TEAM

### SOLAR VERANDA led by Nhombenhle Ndlovu and Dave Pons

**DESCRIPTION:** SOLAR VERANDA provides solar heated water for low-cost house houses and rural homes by collecting rain water and providing a veranda for shelter.

**THE PROBLEM:** The heating of water for bathing and washing is expensive if grid electricity is used; and South Africa has a water shortage.

**THE STORY SO FAR:**

- Uses a solar panel which is attached onto the low-cost house above the doorway. This provides a useful veranda which protects the inhabitants from the sun and rain
- Supported by two large diameter pillars which are the tanks for the hot water
- Each pillar has a tap to draw the water
- Rain water is collected in a gutter attached to the SOLAR VERANDA and this enters the pillar tanks. If there is not sufficient rain, then a bucket is used to pour water into the gutter.
- Also equipped with a photo-voltaic system with a light and a mobile device charger
- Low-cost, made of plastic, effective for 70 litres of 60 degrees water per sun-day.
- Endorsed by Mangosuthu University of Technology

**WHAT'S NEXT?**

- Successfully raised funds to construct prototypes.
- Won 2017 Eco-logic gold award for the best Eco-innovation
- Currently commercialising the innovation.

## PROFILES

# 2016



Yolandi Schoeman (Baoberry) with James New (UNIDO), Minister Naledi Pandor, and Barlow Manilal (TIA).

## OVERALL SA WINNER AND MOST PROMISING WOMAN-LED TEAM

### BAOBERRY led by Yolandi Schoeman

**INNOVATION:** aWetbox

**DESCRIPTION:**

aWetbox is a compact, mobile version of an artificial wetland that provides a more natural and sustainable way to improve water quality in poor communities.

**THE PROBLEM:**

Water availability and treatment in poor communities are very limited, and people are often advised to boil water before use, exposing them to smoke from fires.



**“Participating in GCIP-SA is not easy – it will stretch your capabilities as an entrepreneur and you will grow in ways that you did not even think were possible.”** Yolandi Schoeman

**THE STORY SO FAR:**

- aWetbox is a nature-based solution that mimics the workings of a natural wetland – packaged in a box or a tank
- Grey water is run through aWetbox, where it goes through a natural biological filter to clean the water, removing contaminants and solids.
- Plants in aWetbox can be harvested and fed into downstream businesses to be used as biofuel and oils
- aWetbox can be scaled to treat from 1,000 to 50,000 litres of water.

**WHAT'S NEXT?**

Schoeman and her team are in the process of getting aWetbox ready for market and should be able to offer it to various markets by the end of 2018.

**CHECKLIST:**

- ✓ Patented and cost-effective solution available in an easy-to-assemble kit-form
- ✓ Good ROI – payback time once installed is under 12 months
- ✓ Eliminates 99% of disease-causing micro-organisms and improves the water quality for household use by up to 80%



The 2016 finalists with Minister Naledi Pandor.

## RUNNER-UP

### THEVIA led by Martin Ackermann

**INNOVATION:** Thevia roof tile

**DESCRIPTION:**

A 99.4% recyclable roof tile that is stronger, lighter and quicker to install than concrete roof tiles.

**THE PROBLEM:**

Traditional concrete roof tiles are heavy and prone to breaking because they are brittle. This results in high development costs for builders.

**THE STORY SO FAR:**

- Thevia tiles weigh 75% less than traditional concrete tiles, yet are twice as strong and not brittle

- Thevia tiles weigh 75% less than traditional concrete tiles
- The purchase cost of Thevia tiles is similar to traditional roof tiles, but the long-term project cost is up to 15% less, as they are not brittle and prone to breakage
- Reduced weight means a truck can carry four times the amount of tiles
- It also allows for wider spacing on roof trusses. Therefore fewer, less denser trusses are needed

**WHAT'S NEXT?**

Register with the NHBRC and scale up production to 300 000 to 500 000 tiles per month.



**CHECKLIST:**

- ✓ Water absorption – ASTM D570
- ✓ Dimensional or thermal stability – ASTM D2126
- ✓ Thermal conductivity – Linseis THB100
- ✓ QUV / Accelerated weathering – ASTM G154
- ✓ Bearing test – ISO 178

**“By participating in a global programme, I was given exposure to global skills and expertise on a local level and that was truly amazing.”** Martin Ackerman

## PROFILES

# 2016

**“Being part of the business accelerator encouraged me to push beyond boundaries, question and validate my business model and give confidence to write my own business plan.”** Sandiswa Qayi



Most promising youth-led business for 2016 Sandiswa Qayi with the Hot Spot geyser element sleeve.



## MOST PROMISING YOUTH-LED BUSINESS

### AET AFRICA, led by Sandiswa Qayi

**INNOVATION:** Energy efficiency and clean-tech hot spot buoyant geyser sleeve.

**DESCRIPTION:**

AET Africa produces solutions to conserve, reuse and improve water heating mechanisms that consider the African climate and socio-economic environment.

The Hot Spot is a geyser sleeve that can be fitted over any standard geyser element. The device pushes hot water from the bottom to the top of the geyser, providing 50 litres of hot water (at 50°C) within 30 minutes, which is ideal for a typical household.

**THE PROBLEM:**

High energy consumption of standard high-pressure geysers, high monthly energy bills and high capital investment required to switch to alternative heating solutions.

**THE STORY SO FAR:**

- Positive feedback from households piloting the Hot Spot
- Social and market recognition of the product winning several awards in 2017
- Improved product development in terms of design features for improved performance and graduating from proof of concept to pre-production prototype
- Forming strategic partnership with key players and funders for seed funding estimated at R1,5million
- Created 10 jobs (directly and indirectly) in the process and promoted skills development and work experience for graduates.

**WHAT'S NEXT?**

- Market validation and pre-commercialisation
- Launch of a small-scale production line, with limited product sales planned to commence towards the end of 2017.



## INNOVATION FOR SOCIAL IMPACT

### SUSTAINABILITY PROFESSIONALS, led by Louise Williamson

**INNOVATION:** Mashsha stove

**DESCRIPTION:**

Efficient biomass/wood fuel stoves that use half the required fuel of open fires. They are also safer to use, thanks to a closed gasification process.

**THE PROBLEM:**

Rural schools and households are heavily reliant on wood fuel. The resultant smoke impacts negatively on their health and the environment.

**THE STORY SO FAR:**

- The Mashsha metal cook stove burns with a clean hot flame using gasification techniques
- It saves 56% fuel, is nearly smoke free and halves the cooking time
- The briquettes are a supplementary fuel and are made from waste cardboard, which beneficiaries are taught to make

**WHAT'S NEXT?**

Finalise large biomass briquette composition ratios, get to market and expand the product range.

**CHECKLIST:**

- ✓ 129 units sold
- ✓ Currently in the top 53 for the African entrepreneurship awards
- ✓ Awarded a spot on the GIBS social entrepreneurship course
- ✓ Secured a grant from the Diageo Empowerment Trust Fund, allowing for the purchase of biomass briquetting equipment, more R&D and job creation

**“GCIP has enabled me to bridge my innovation to a socially inclusive micro-enterprise that benefits mostly women in marginalised communities.”**

Louise Williamson





2017 semi-finalist group in Cape Town for the mock judging event.

## PROFILES

# 2017



## WINNER

### KHEPRI INNOVATIONS, led by Bandile Dlabantu

#### DESCRIPTION:

Khepri Meal consists of highly nutritious dried and defatted larvae that are ground into a high-protein meal. It can be supplied pelleted, crushed or milled for blending into animal feeds. It is specifically useful for the feeding of monogastric animals including chickens, pigs and fish.

#### THE PROBLEM:

Conventional animal feed is expensive. Khepri Meal is cheaper than conventional feed based on fish meal, reducing the cost of animal farming. It also produces compost that is sold to farmers to organically improve yields.

#### THE STORY SO FAR:

- 100% black owned biotechnology company
- Nutritional value of Khepri Meal:
  - Crude protein (min) 400 g/kg
  - Moisture (max) 100 g/kg
  - Crude fibre (max) 121 g/kg
  - Crude Fat (max) 100 g/kg
  - Calcium (max) 5 g/kg
  - Phosphorus (max) 30 g/kg

**WHAT'S NEXT?** Khepri's vision is to be the number one bioconversion research and sustainable animal feed producer in the world.

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**"The GCIP-SA was an amazing experience – I learned a lot!"** Bandile Dlabantu

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## RUNNER-UP AND INNOVATION FOR SOCIAL IMPACT AWARD

### GRACIOUS NUBIAN led by Euodia Naanyane-Bouwer

**INNOVATION:** Re-usable, bio-degradable sanitary pad

**DESCRIPTION:**

We design, develop and manufacture a reusable, bio-degradable and hygienic sanitary pad.

**THE PROBLEM:**

67% of girls in South African rural areas stay out of school during menstruation because they simply cannot afford sanitary pads.

Disposable pads can take from 500 – 800 years to decompose.

Also, it is an environmental risk as the bulk of waste material found in water treatment plants is disposable pads. The Gracious Nubian sanitary pad will enable users to contribute saving the environment – no more heaps of disposable sanitary pads on our landfills or in water retreat plants. This pad will also be made available to all girls and women who may be in need of it.

**THE STORY SO FAR:**

- Innovative layering
- Durable material; does not tear unless it's cut
- The material is four times more absorbent than that of comparable products
- Washing process requires only 5l of cold water (including grey water from body wash), with any kind of soap, and can be air- or sun-dried

**WHAT'S NEXT?**

Naanyane-Bouwer and her team are in the process of getting Gracious Nubian ready for market and are working towards offering it to various markets by the second quarter of 2018.

**CHECKLIST:**

- ✓ Cost-effective, reusable sanitary pad
- ✓ Enables girls to stay in school
- ✓ Minimizes landfill.

**“Participating in GCIP-SA is hard work and it stretches entrepreneurs in all areas required for a successful business. I sincerely appreciate the de-risking of the business model. This is one of the very best platforms for entrepreneurial accelerator programmes globally.”**

Euodia Naanyane-Bouwer

## WOMEN TEAM AWARD

**“GCIP has taken our idea and converted it into an innovation that can be effectively commercialised.”** Stephanie Pons

### BEAUTIFUL-U led by Stephanie Pons

**INNOVATION:** Touch Tap

**DESCRIPTION:**

A tap that is turned on by touching the base of the tap so as to save water.

**THE PROBLEM:**

Being a team of disabled women we have found it very difficult to open conventional taps and not waste water, and so we have invented Touch Tap which is easy to open and most importantly SAVES WATER as you only use the water you need.

**THE STORY SO FAR:**

- In order to make this tap that opens by touching it, we have used recycled plastic so as to minimise the cost.
- We have manufactured and used prototypes to great effect.
- We have found that Touch Tap would be useful in South Africa homes and in all developing countries to save water.
- Touch Tap has the added benefit of creating jobs through its sales model

**WHAT'S NEXT?**

We aim to commercialise Touch Tap in 2018 with large-scale manufacture.



## RUNNER-UP

### SHARKSAFE BARRIER led by Dr Sara Andreotti

#### DESCRIPTION:

Sharksafe is the first eco-friendly shark-specific product to protect people and sharks.

#### THE PROBLEM:

Coastal areas affected by shark attacks on beachgoers experience losses in terms of tourism revenue and human and marine life, due to inadequate shark protection measures currently in use.

#### THE STORY SO FAR:

The SharkSafe Barrier prevents shark attacks by keeping sharks separated from swimmers and surfers. It bio-mimics the visual appearance of a kelp forest and creates an electro-magnetic field, both proven to deter sharks.

The alternatives to SharkSafe are designed to protect individual surfers rather than the whole beach or, if protecting the beach, they are not eco-friendly or not shark-specific and have high maintenance costs.

#### WHAT'S NEXT?

- Two international pilot customers secured for 2018 in areas where shark attacks are causing a severe problem to the local economy
- These customers will allow us to scale up and dominate the shark protection market at a global level.

## YOUTH TEAM AWARD

### NOSETS™ developed by Yellow Beast (Pty) Ltd, led by Pontsho Moletsane

**INNOVATION:** Simplified Irrigation system

#### DESCRIPTION:

Nosets™ uses machine learning to effect autonomous irrigation using real-time data to avoid evaporation, prevent over-irrigation, and ensure plant health in high-value crop agricultural markets.

#### THE PROBLEM:

South Africa is a water-stressed country, and dam levels are frequently low. Agriculture uses 60% of the available surface water. In addition, water is lost through evaporation and over-irrigation, while the intuition of individual farmers determines when to apply water. Water gets applied when it is not necessary; wasting water and energy and harming crops.

#### THE STORY SO FAR:

- Nosets™ simplifies Irrigation. The device is simple and easy to use while offering cost savings, water and energy savings to growers of high-value crops
- Developed as a proof of concept and entered into several competitions to raise capital
- Prize money has been invested in developing a laboratory-scale prototype.

#### WHAT'S NEXT?

- With partnerships in the water and agricultural sectors we plan to pilot the optimised version of the product
- Then going commercial.



The 2017 winner, Bandile Dlabantu, pictured with runners-up Dr Sara Andreotti and Euodia Naanyane-Bouwer.



2017 GCIP-SA Finalists with Minister Pandor, Dr Mjwara, Mr El Mekwad and Mr Barlow Manilal.



Minister Pandor with Mr Barlow Manilal.



Trophies developed by NLC. Winner Bandile Dlabantu with Minister Pandor.



Women team award winner, Stephanie Pons; Youth team award winner, Pontsho Moletsane and Innovation for social impact award winner, Euodia Naanyane-Bouwer.

## SHOWCASING



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**"Business model is a great tool. The judges are very straight forward – they do no beat about the bush – this helps a lot."**

Linda Linganiso

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**"The course was not just fed to us, but we were made to understand it, this improved my insight into the machinations of being a successful entrepreneur."**

Mark Rennie

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## PHOTO GALLERY



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**“The methods changed  
my perspective  
completely and  
accelerated my business  
quite significantly”**

Clement Mokoene

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**“The programme shows step by step how to do things. That and the commitment displayed by everybody in GCIP-SA is the cherry on the cake, it’s more valuable than money.”**

Christiaan Hartzenberg

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## PHOTO GALLERY



“The training was not only involving, but practical as well. It forces one off their desk and into the field, where businesses grow and adapt,”

Isaac Doyi





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**“The networking  
and showcasing are  
incredibly beneficial  
and such  
an opportunity will  
be hard to find on  
your own.”**

David Price

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## GCIP-SA – WHAT NEXT?

The development of a second phase of the GCIP-SA is strongly supported by all the project partners, to build on the momentum created over the past four years and to accelerate the commercialization of clean technology innovations in South Africa.

To maximize the ability of each start-up to create jobs, generate wealth and reduce environmental impact a new programme would therefore need to support alumni in commercializing their innovations, and scaling up and expanding

globally, where appropriate. The current programme has shown that further entrepreneurship support, product development and commercialization, as well as enhanced linkages with investment opportunities and access to finance are key areas of future focus.

The new chapter of the GCIP-SA story would contribute to strengthening the resilience of the complex South African entrepreneurial economy to operate within the global market, and will have increased economic, environmental and social benefits for the country.



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