



# CASE STUDY 3

## USE-IT: Innovation in the Waste Value Chain

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## 1. Introduction

Regional Economic Development stresses concepts like partnership, value chain development, beneficiation, innovation, scalability, SMMEs, job creation and the green economy. There is no shortage of ideas and theories about what each of these concepts might mean practically or even efforts to give effect to them.

USE-IT is an innovative Durban based section 21 company is that it has an operating model that manages to incorporate all of these ideas in order to maximise impact. USE-IT is the story of how simple ambition can generate a powerful and complex set of activities and interactions with multiple outcomes.

This case study has been written up because we believe that there is much to learn from this project.

USE-IT was set up with a simple focus- to identify and waste beneficiation opportunities with a view to achieving two things -diverting waste from landfill and creating jobs.

A commitment to green economy means we need to look at waste innovation. Waste innovation necessitates a move away from the disposal of waste to landfill, and instead focuses on waste minimization, reuse and recycling. It entails thinking differently about waste and recognising its potential as a renewable resource that provides opportunities for beneficiation, rather than as an unwanted product that requires treatment and disposal.<sup>1</sup> That is, useful constituents can be extracted and fed back into the economy for further processing, creating opportunities for employment and the development of local enterprises.

USE-IT aims to maximise job creation through waste diversion from landfill, which is directed through waste beneficiation project development. Not only does USE-IT work with existing industry, they have also achieved significant success with enterprise development and community projects.

The USE-IT case study is relevant to regional economic development because:

- It highlights the importance of value chains and the opportunities for development that they provide. USE-IT is an example of waste beneficiation – where the opportunity to unlock value from waste products has been utilised
- It highlights the different interests of different parties in the value chain as well as the potential for parties to work together in common interest for mutual benefit
- The model can be replicated countrywide to unlock the green economy in the waste sector
- The model is innovative and inspirational.

Their approach is to move *'Towards a resource efficient, low carbon and pro-employment growth path'*. However, there is recognition that government alone cannot manage and fund this transition to a green economy, and that the private sector and civil society must play a fundamental role.<sup>2</sup>

## 2. Background

### History

USE-IT was established as an NPO in 2009 by the eThekweni Municipality to research and develop waste beneficiation technologies in the eThekweni Metropolitan area. Now in its sixth year of operation, USE-IT helps to divert waste from landfill and create as many green jobs as possible in doing so. Their focus extends beyond recycling, to the beneficiation of waste by unlocking the multiple opportunities from different waste streams.

USE-IT also provides specialised services including:

- Research and Development
- Project facilitation, advice and support
- Pilot project funding and facilitation of funding and business plan development for larger projects
- Information dissemination
- Network facilitation with the public and private sector and international linkages.

Key focus areas of work include:

- New, environmentally-friendly building materials from builder's rubble, demolition waste and soil fill that outperform and are cheaper than current building materials
- Diverting organic wastes and sludge through several beneficiation technologies to create Bio-Organic Fertilizers that outperform chemical fertilizers without the negative environmental impacts
- Composite technologies – using blends of different wastes and virgin materials to create environmentally-friendly and thermally efficient building materials and products for outdoor applications
- Electronic Waste – addressing renovation, reuse and responsible recycling of old computers, cell phones, VCR's, DVD machines, etc. with a focus on beneficiation technologies on all waste components of this increasing waste stream
- Assessing waste beneficiation and remanufacturing technologies for standard recyclable materials such as paper, cardboard, plastic, glass and metals
- Addressing tyre recycling opportunities with a focus on remanufactured products
- Waste minimization techniques and approaches
- Information dissemination, active networking and engagement with industry, the private sector, public sector and international finance and development agencies<sup>3</sup>.

### Funding

USE-IT receives operational funding from the eThekweni Municipality, some of which is used to leverage additional funding from both the public and private sectors. They have in fact managed to leverage more than 10 times the amount of seed funding received, with additional funding for projects from both the public and private sectors.<sup>4</sup> This has allowed them to create large-scale projects around building materials, organic waste, composite technologies and electronic waste. They are currently in the process of finalising R2.1 million in annual funding from the eThekweni Municipality for the next three years. As per their business plan, they will now need to secure R6 million in funding from outside entities over the next three years.

### Impact

Through landfill diversion alone, USE-IT claims to have saved the eThekweni Municipality tens of millions of Rands, much more than funding received from them. In the process, they have also

created more than more than 2200 jobs (371 direct jobs, 1766 indirect jobs and 98 contract jobs). “Considering eThekweni’s total financial contribution over the last 6 years USE-IT has managed to achieve just short of R33,500 spend per direct job facilitated with 5 additional indirect jobs created for every direct job whilst effectively saving the city R2.74 for every Rand spend”.<sup>5</sup>

Interestingly, the private sector contribution has been more than double the public sector funds received. This is likely because inter alia USE-IT seems to be well positioned to provide opportunities for directing private sector Corporate Social Investment and Enterprise Development funding in a targeted and meaningful way, whilst creating the space for public-private partnerships.

*“For every rand that we have leveraged from public sector funding, we have saved more than a Rand in landfill diversion. Even without looking at all the extra social and environmental benefits like job creation. We have cost the government nothing. We have created whole new economies out of closing the loop of the value chain in waste.”*

*Interview with Chris Whyte, Managing Director of USE-IT in SA Good News, 24/11/2014 <http://www.sa-goodnews.co.za/amazing-south-african/6423-use-it-you-can-do-amazing-things-with-waste.html>*

## Awards

The innovative contribution USE-IT has made to the Green Economy and to waste innovation has been recognised in the following awards that they have received:

- **Mail & Guardian Greening the Future - Green Technology Innovation Award, 2015.** This award recognises cutting edge technological innovations aimed at the more efficient use of natural resources.<sup>6</sup>
- **Mail & Guardian Greening the Future – Editor’s Choice Award, 2015.** A newly introduced award which honours an environmental project, which stands out as a shining example of best practice in the field.<sup>7</sup>
- **Better Living Challenge Award – Structural Home Category, 2014.** The Better Living Challenge, an initiative of the Western Cape Government’s 110% Green programme and the Department of Economic Development and Tourism, is a competition that aims to showcase sustainable and cost effective housing design solutions in low-income communities. USE-IT won this award for its environmentally friendly Compressed Earth Blocks.<sup>8</sup>
- **Institute of Waste Management of Southern Africa’s (IWMSA) - KZN Waste Management Innovation Trophy, 2014.** The IWMSA KZN Waste Management Awards is a joint initiative between IWMSA and the KwaZulu-Natal Department of Economic Development, Tourism and Environmental Affairs that pays tribute to organisations that have made a positive contribution to the waste industry in KwaZulu-Natal. The Innovation Trophy that USE-IT was awarded is a special award that acknowledges organisations that are implementing innovative practices in the waste sector. USE-IT was recognised for the assistance that they offer organisations in reducing their waste to landfill and creating job opportunities and was praised for the role they play in providing an interface between the public and private sector.<sup>9</sup>
- **PETCO (PET Plastic Recycling Company of South Africa) - Best Waste Management Initiative of the Year Award, 2014.** The PETCO award recognised USE-IT for their commitment to promoting recycling and maximising waste diversion by finding innovative ways to recycle materials generated in and around Durban.<sup>10</sup>

### 3. Key Projects

#### Hammarisdale Waste Beneficiation Centre

USE-IT's flagship project is the development of a waste beneficiation centre in Hammarisdale, on the outskirts of Durban. This project is being funded by the Green Fund and carried out in partnership with the KZN Department of Cooperative Governance and Traditional Affairs and eThekweni Municipality.



The development is set to be the largest green hub on the continent, and will be built using USE-IT's Compressed Earth Blocks (CEBs). Several other green elements will be incorporated into the building itself, including recycled Cyclocor roof tiles, full rain-water harvesting, storm-water collection systems, energy efficient hot water systems, LED lighting and off-grid green power production using waste materials.

The centre will boast state-of-the-art technology to facilitate the recycling of plastics, glass, tyres, compact fluorescent lightbulbs and e-waste. The site will also feature a retail area to showcase and sell the products to be manufactured at the site (including the CEBs). Additional future features may include aquaponics, organic farming, biofuel technology and composting facilities.<sup>11</sup>

USE-IT does not plan to undertake all the components, but rather to provide an enabling environment where a variety of private sector companies and small enterprises in the waste beneficiation sector can operate. The centre will thus also include several incubators to accommodate community-type projects in waste beneficiation, waste to art and upcycling production areas.<sup>12</sup>

Construction is due to begin in April 2016 and completed in mid-2017. However, in the longer term, USE-IT envisages that five such centres will be needed to service the entire eThekweni Municipality, as regional centres are required to minimise the costs associated with transporting waste to the sites.<sup>13</sup>

#### Compressed Earth Blocks

The Compressed Earth Block (CEB) Project is aimed at promoting low technology manufacturing of building blocks from waste material and soil. USE-IT has secured appropriate machinery for the block manufacture process, which utilizes locally available materials and the equipment is mobile. CEB's are made up of a mix of discarded builders' rubble (25%), readily available soils (70%) and cement stabilising agent (5%). CEBs are used in a variety of applications abroad, but are currently only approved in South Africa for single-story buildings. They are approved by the South African Bureau of Standards (SABS) as well as the National Homebuilder Registration Council (NHBC) and Construction Industry Development Board. In comparison to concrete

blocks CEBs are 3-5 times stronger and 10 times more thermally efficient than concrete blocks. They are also greener due to carbon savings, cheaper than conventional cement blocks by 20%, and the building process is faster and simpler.<sup>14</sup>

USE-IT lists the following examples of where CEB's have been used locally:

- The Wattle Crane chick rearing facility for the KwaZulu-Natal Crane Foundation
- An orphanage in Shongweni for New Horizons Trust
- A recycling centre in Howick for Wildlands Conservation Trust
- Demonstration houses in Pietermaritzburg and Durban, as well as site offices and workshops
- CEB's are also to be used in a R30 million waste beneficiation centre planned for Hammarsdale.

### **E-Waste Recycling and Refurbishment Centre**

The Green Fund and the KZN Department of Cooperative Governance and Traditional Affairs are providing funding to USE-IT for the development of an electronic waste (e-waste) refurbishment and recycling centre in KwaZulu-Natal.

The Centre will house a refurbishment centre, a dismantling centre, a dismantling unit specially designed for Cathode Ray Tube (CRT) monitors that are found in computers, cable stripping units, plastic casing granulators, and compactors and grinders that are required for the other e-waste components.

Dismantling e-waste is expensive as it requires specialized equipment, so one of the main benefits of this centre is that it will enable all the different types of e-waste and different components to be dismantled in one place before being sent off for waste beneficiation projects.<sup>15</sup>



### **Composting and Organics**

USE-IT is also committed to exploring opportunities for composting operations of clean organics. They have been working on a pilot project with the Duzi Umgeni Conservation Trust (DUCT) exploring composting operations around harvested aquatic weed from the rivers in eThekweni. They also plan to set up a small composting operation for the Hammarsdale Waste Beneficiation Centre to process in the region of 10-20 tonnes of compost per day to feed into the downstream agricultural applications.

In the longer term USE-IT would like to establish a large-scale Bio-Organic Fertilizer production facility that can handle the large volumes and create a product suitable for export.<sup>16</sup>

### **Research & Development**

USE-IT is constantly researching and promoting the development of new initiatives in waste beneficiation. A list of some of the initiatives currently in development stage are:

- Supporting Glass Recycling
- Revitalising the Materials Recovery Facility
- Rethinking the Orange Bag Project

- Supporting Tyre Recycling
- Diverting Wood Waste from Landfill
- Promoting Polystyrene Recycling and Beneficiation
- Researching Paper and Cardboard Beneficiation Projects
- Conceptualising a Plastics Processing Facility

More information on these initiatives can be found at [http://www.use-it.co.za/?page\\_id=71](http://www.use-it.co.za/?page_id=71)

#### 4. Lessons and Conclusions

A commitment to the green economy and waste innovation entails a change in thinking and necessitates a move away from the disposal of waste to landfill. It involves recognising the potential of waste as a renewable resource that provides opportunities for beneficiation, rather than as an unwanted product that requires treatment and disposal. USE-IT has done just this with its choice of innovative projects and ideas. This award-winning organisation has also demonstrated how they have impacted costs savings, job creation and environmental sustainability.



The USE-IT model relies on building mutually beneficial Public-Private-Partnerships to promote green economic development – creating jobs and effecting real savings. Acting as a facilitator of green projects for both the public and private sectors, USE-IT has also been able to effectively channel public sector funding - which may otherwise have been inaccessible due to government red tape, and provided the private sector with an opportunity to channel their CSI and ED spending in a manner that builds their green, socially responsible profile.

USE-IT believes that they have a model that could and should be replicated across the country to unlock the green economy in the waste sector.

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