



## **Turning a ‘tragic plastic’ problem into a nation building solution**

### ***Ground-breaking up-cycling invention to launch in South Africa***

**15 March 2019, Cape Town:** Imagine if all South Africa’s unrecycled plastic waste, at **1 100 000 million tons per year**, could create thousands of jobs, clean our environment and help build our houses, hospitals, schools and roads.

Don Thompson, the CEO of The Center of Regenerative Design and Collaboration (CRDC), is about to make this a reality. He is the inventor of a process that can turn **any** plastic – dirty or clean and in any form – into the very building blocks of sustainable development. The product, EcoArena PRA (Pre-Conditioned Resin Aggregate) and Ecoblock are innovative environmentally friendly products which incorporate regenerated waste plastic particles combined with a standard sand-cement mixture to produce a highly resistant, durable cement or cement block while providing a viable up-cycling usage of this waste material.

The product has been tested and applied by PEDREGAL in Costa Rica for the past two years with great success (see brief case study below). CRDC is also collaborating with international US chemicals giant, Dow in the development of EcoArena in a bid to develop a lead initiative for the alliance to end plastic waste.

<https://corporate.dow.com/en-us/news/press-releases/dow-to-help-lead-1-billion-global-alliance-to-end-plastic-waste-in-the-environment>

In South Africa, CRDC has partnered with a leading operations company that has extensive expertise and a long track record in on-site waste management, plastic recycling, waste to energy and implementation of zero waste to landfill solutions.

**Donald Thomson and PEDREGAL are introducing EcoArena PRA to South Africa via an initial investor and partner roundtable to be held in Cape Town in the first week of April.**

### **The case study**

In Costa Rica, Thompson has been working with PEDREGAL, the largest cement, and concrete block company in Costa Rica and in collaboration with DOW, the American multinational chemical corporation. Over the past two years, the product has been tested and used for the last six months. The aim is to use 4 000 tonnes of plastic waste per month for the EcoArena technology. The feasibility of the product as an environmental break-

through is proven and as a commercially viable and profitable commodity it also meets sustainable development requirements on all levels.

PEDREGAL began testing the use of EcoArena in their CMU concrete blocks, having achieved successful technical results and compliance with international standards (ASTM and C90). PEDREGAL then introduced EcoArena to all their concrete products under the prefix ECO. Sales and Marketing Director of PEDREGAL, David Zamora says: "This breakthrough in transforming plastic and using it in the same way as you would conventional aggregate is a game-changer. Not only can we conduct our business in a more sustainable way but also we can also help solve one of the biggest problems we have created as human beings – that of plastic contamination. This is the very essence of our circular economy – one in which the construction industry is helping the plastic industry solve a waste problem by turning it into a raw material that can be used in any construction on the planet."

## **The key benefits of CRDC EcoArena**

### **Concrete and construction**

- 10% increase in strength
- 8% to 16% decrease in weight (with 5% or 10% PRA)
- Increase in thermal properties
- Same fire resistance as with standard concrete
- EcoArena PRA can be used in pressed concrete products as well as in bagged cement or poured concrete
- Lower dependency on other raw materials
- Obvious marketing benefits
- Reduce cement industries carbon footprint and carbon tax bill (South Africa)

### **Environmental**

- Supports and grows the UN Sustainable Development Goals
- Reduces Carbon Footprints by eliminating plastic to landfill and plastic pollution - (1 tonne of mixed plastics going to landfill has an emissions factor of 21.3842kg CO<sub>2</sub>e)
- All types of plastic can be upcycled into EcoArena PRA – i.e. no costly separation required
- Reduce plastic pollution in rivers, oceans, cities and impact on landfills
- Supports Zero Waste to landfill and Plastic producer responsibility and government programmes or initiatives
- Waste plastic permanently eliminated from the environment
- CRDC and EcoArena are foundation partners of Habitat for Humanity

### **Social and SMME**

- SMME and job creation from waste plastic collection, plastic shredding SMMEs and transport
- Cleaner cities and healthier environments
- Support SMME Concrete block manufacturers
- Help support the building of better social housing in Africa with a product that is stronger and benefits the environment and society.

## **The case for upcycling plastic now**

The UN wants individual countries to sign up to "significantly" reduce plastic production, including a phasing out of single-use plastics by 2030 – a goal inspired by the 2015 Paris Agreement on voluntary reductions of carbon emissions. "Plastic is a very good material,

it's durable, flexible and light," Kiisler said. "This means we should make the best out of it for as long as possible instead of disposing of it."

[www.news24.com/Green/News/plastic-in-crosshairs-at-un-environment-forum-20190311](http://www.news24.com/Green/News/plastic-in-crosshairs-at-un-environment-forum-20190311)

### **Why South Africa?**

South Africa currently consumes 1.5m tonnes of plastic annually, of which only 21% is recycled. The rest ends up in land fill, in rivers, on beaches and in our oceans. A recycling programme is urgently needed. Cleaning up plastic is not an easy task and it costs money to manage waste. All this bad news does not make for happy reading. At the same time, industry and commerce, retailers and consumers are seeking better ways to work with plastic and most assume that the abolition or drastic reduction of the culprit plastic would be the best solution. Don Thompson himself used to be consumed by a hatred for plastic, until he realised that it was necessary to work and within the plastic industry in order to combat the enormous waste problem. After an arduous and interesting journey of anti-plastic activism, Thompson, an engineer, entrepreneur and environmentalist, invented a product that uses plastic – all and any waste plastic.

At a time when the world is in outcry about 'tragic plastic' in our oceans, CRDC, which works with the Ocean Recovery Alliance, has created not only a fool-proof solution but also a game-changer for using plastic waste in a commercially viable manner. By delivering an effective environmental solution, EcoArena also provides a compelling answer to some of South Africa's societal problems.

CRDC will be testing EcoArena PRA with two major concrete manufacturers in the Western Cape as well as a major South African cement producer. "In South Africa, there is an established and sophisticated cement industry. Against this, we need to create jobs, we need to clean up the environment and there is an urgent need for housing. Our plan is to use the Costa Rican model to initially launch in the Western Cape before rolling out the initiative nationally."

Thompson explains that Costa Rica is a small market (5 million people) compared to South Africa, which is more developed and has as many if not more pressing social needs. The long-term plan for EcoArena is to then to take it to the first world.

The South African government has recognised the role that waste can play in creating jobs and socio- economic opportunities, and in moving South Africa towards a more resource efficient economy. This is evident in the number of initiatives and legislative reforms that have been proposed by government to boost growth in this sector (Source: Green Cape 2018 Waste Market Intelligence Report).

**"If there is so much 'value' R25b (minimum) locked up in South Africa's waste and the unit value (R/t) for most streams is greater than the cost of landfilling (R100-R150/T), why are we only recycling ~ 10% of all waste generated?"**

Dr Linda Godfrey Council for Scientific and Industrial Research (CSIR), South Africa:  
A Waste Research, Development and Innovation (RDI) Roadmap for South Africa

### **The product and process**

EcoArena incorporates regenerated waste plastic particles with a standard sand-cement mixture to create a highly resistant, durable cement, concrete block. or any formed concrete product. Each EcoArena block contains 260 grams of plastic, none of which needs to be separated, cleaned or treated in any way – even if it contains sand or is contaminated. Very little water is used in the process. The resultant EcoArena block represents a 5-10% decrease in total weight compared to a standard concrete block.

The process begins upon the disposal and recovery of the waste plastic, after which the obtained material is converted to a solid mass via heat extrusion. It is then ground to the required particle specifications. After this processing phase, the resulting mixed-polymer aggregate is incorporated directly into a mixer with a sand-cement mixture. Once a homogeneous mixture is achieved the moulding process for creating the standard block begins and emerges, showing no visible difference from traditional concrete aggregates. The resulting product is equal in terms of resistance and mechanical characteristics to a traditional concrete block – the only difference is that it is considerably lighter and stronger while also effectively using a large quantity of plastic waste and eliminating it from landfill with the attendant benefits of also reducing the CO2 emissions of plastic in landfill. EcoArena will help reduce carbon footprints for municipalities, plastic manufacturers and the cement and concrete industries.

Thompson explains: “The objective is to create a platform whereby single-use plastics may be transitioned into a supply stream for high-quality construction materials while providing a solution to two of the world’s most pressing issues: the recovery of waste plastics from the environment and the global housing deficit. Every sector of society, including the under-privileged and homeless, stands to benefit from the application of this innovation and plan.”

Please view the attached CRDC EcoArena presentation and the attached video or view the [EcoArena video here](#)

[www.pedregal.co.cr/web/](http://www.pedregal.co.cr/web/)

[www.dow.com/en-us](http://www.dow.com/en-us)

[www.businesswire.com/news/home/20181127005502/en/Dow-Announces-New-Actions-Support-Global-Efforts](http://www.businesswire.com/news/home/20181127005502/en/Dow-Announces-New-Actions-Support-Global-Efforts)

### **NOTES**

1. The South African waste management landscape is set to experience a raft of legislative and regulatory changes that will advance the country toward a more resource-efficient economy. This will create opportunities for business and investors in the waste sector who focus on plastics, organics, e-waste, and construction and demolition waste.

The promulgation of the paper and packaging IndWMP will unlock greater volumes of clean feedstocks and more business support for the sector, with further support likely through Operation Phakisa. There is a need for thermal treatment technologies for dirty mixed plastics, refuse derived fuels (RDF) and thermoform PET. *Source: The Green Cape Market Intelligence Report 2018*

## 2 About CRDC

The Center for Regenerative Design and Collaboration is a Costa Rican company, founded in 2010 as a volunteer-based beach clean-up program and is presently recognized internationally for its contributions towards sustainable product design. CRDC is comprised of a diverse, multi-disciplinary group of world-class associates, experts in the packaging and food/beverage industries, conservationists and award-winning designers working together to create products, industrial processes and economic models that provide economic, social and environmental benefits. CRDC recognizes potential synergies between the single-packaging and construction industries through the development of an innovative solution whereby packaging waste may be converted and permanently fixed within new construction materials, thereby eliminating associated environmental impacts and creating a second use value stream.

CRDC in collaboration with PEDREGAL, a regional leader in the construction materials industry, has successfully created a high-quality mixed polymer concrete aggregate utilizing "dirty" or unmanaged plastic from the waste-stream, recovered from industrial, commercial and domestic sources which is effectively sequestered in concrete building blocks.

**To meet Donald Thompson and join the CRDC partner and investor roundtable in April, please contact CRDC South Africa lead partner Deon Robbertze: [deon@thechangeagent.co.za](mailto:deon@thechangeagent.co.za) | 082 415 6674.**

**FOR INTERVIEWS AND MORE INFORMATION IN ADVANCE  
OF DON THOMPSON'S APRIL VISIT TO SA,  
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