ENVIRONMENTAL AND SOCIAL ADVISORY SERVICES

## How pollution can be a catalyst for creativity

*"Pollution is nothing but the resources we are not harvesting. We allow them to disperse because we've been ignorant of their value."* R. Buckminster Fuller

Reduce, reuse, recycle. These three words tells us to use less, find ways to use things again in different ways, and try and change what can't be used into something that can. However, these three words seem to fall flat when, based on estimates, the world cities generate 1.3 billion tonnes of waste annually. To put this in context, the blue whale can weigh as much as 146 metric tons, according to NOAA. So, a gigaton is more than 6 million blue whales. So, the total waste generated from the worlds cities annual is equivalent to about the weight of 8 million blue whales! With current urbanisation and population growth rate, the global waste generation is estimated to rise to 2.2 billion tonnes by 2025. Apart from the contamination of water resources and severe air pollution, health impacts are another key issue to be addressed.

Given Caryn's keen interest in creative solutions to every day environmental issues, she has shared some inspirational and ingenious inventions to help combat global pollution.

### Ink made of air pollution

According to the World Health Organization (WHO), 4.2 millions deaths occur every year as a result of exposure to ambient (outdoor) air pollution. 91 % of the world's population lives in places where air quality exceeds WHO guideline limits.

Inventor Anirudh Sharma, the founder of Graviky Labs, engineered a way to capture pollution in the air around us and turn it into something useful. AIR-INK is a deep black ink that is made from PM 2.5 pollution. After taking a photo of the exhaust of a diesel generator and the remaining black mark left behind by the residual particulate waste, the image led Anirudh to rethink pollution and inks. Most of the inks we use today are traditionally made from burning fossil fuels to produce carbon black used to produce inks. However, there are already millions of liters of fossil fuels being burnt every day, so why not try and capture that pollution and recycle it to produce carbon ink?

This is exactly what Anirudh did. He conducted a small experiment using a candle. He built a device that would suck in the candle soot, mixed that with some vegetable oil and vodka (note: he remained sober throughout!), and after churning the mixture, he created a rudimentary form of ink which could be used in a printer cartridge. After many experiments and pilot trials, his team was able to capture 95 % of pollution released from their prototype diesel generator, without affecting the generators performance. During these experiments, a large company approached his team to be part of a global art campaign using the inks made from this pollution. Ink

**Coastal and Environmental Services (Pty) Ltd**
T +27 43 726 7809 | F +27 43 726 8352
25 Tecoma Street, Berea, East London, 5214 | PO Box 8145, East London,
Reg no: 2012/151672/07
**www.cesnet.co.za**

Directors: Z Mayet, AM Avis.

used to fill one pen was made from 40-50 minutes of recycled emissions from the prototype generator. This was eventually launched on a larger scale, and soon after AIR-INK was being supplied to artists all around the world. Not only has AIR-INK created a buzz in trendy pop culture, but it has led the company to form incentive-based schemes with larger corporate pollutants.

The company continues to advance under research and development in the aim of commercially repurposing carbon rich pollutants into tools for art.

'Plastic' made from wood

The VTT Technical Research Centre of Finland has created a compostable multi-layer material from agricultural and forestry by-products, which could be used for stand-up food pouches for products such as muesli, nuts, dried fruit and rice.

These wood by-products contain cellulose, the most abundant renewable polymer on the planet, making this new material an environmentally benign alternative to fossil fuel-based, multi-layered plastic packaging.

Watch this space for more interesting articles.

**CES's experience with waste**

In addition to recommending mitigation measures for waste related impacts from development projects as part of the Environmental Impact Assessment (EIA) process, we, as a company, have been involved in numerous projects where the reduction, reuse and recycling of waste has been a key focus, for example:

- A composting facility which turns organic waste into compost, which is then sold as 100% organic fertilizer.
- The conversion of cattle manure into biogas to supplement a cattle farm's energy needs.
- The conversion of different types of polyolefin plastics into hydrocarbons, which are further refined and sold to organic chemical consumers.
- A plastic waste recycling facility where plastic waste is collected from various local suppliers and industries and converted into plastic pellets for sale to various customers.

As a company, we aim on achieving a balance between development and environmental protection, and therefore welcome opportunities which act as a catalyst for creative environmental solutions.