



The Sophia FOUNDATION

Raising consciousness for the good of the whole

A social enterprise
'Paper Log'
pilot project

Offering ideas for a sustainable future

Our Story

The Sophia Foundation initiated a feasibility study for the launch of a social enterprise 'Paper Log' Pilot Project transforming office printed paper into fuel for low income families.

Good intentions

The Energy to Waste recovery process uses printed paper soaked in rain water, hand-pressed into shape with a metal log maker and the sun to dry out the 'Paper Logs'. Designed to improve human well-being the 'Paper Logs' burn slowly, save money on heating bills, are an alternative to burning charcoal/wood whilst conserving forests.



When the project started we were unaware of [dioxins](#), a chemical compound found in 'Agent Orange', the chemical used during the Vietnam War. Our concerns arose from watching the film [Trashed](#) with Jeremy Irons at the [South African Eco Film Festival](#). We learnt that some solutions are as toxic as the problem: **burning plastic through incinerators releases dioxins**. [Studies](#) have shown dioxins can cause cancer, endocrine disruption including diabetes, sex hormone disorders, liver damage... and **raised the question**
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"What happens to printer ink and toner when it is incinerated?"

The answer left us with no choice but to stop the project. We wanted to share our revealing journey with you as we hope it will contribute towards a healthier and more harmonious future for all life forms.

Research into printer ink and laser printer toner

Our investigation began with local ink and toner suppliers who advised that ink was 'less bad' than toner. Early toners contained [soot and rust](#) but **today printer toner is made of plastic** (usually acrylic or polyester resin), colourants (purified carbon black, iron oxide, or pigments) and special additives (for electrical charge, powder flow control and fusing properties). The image is made permanent through a combination of precisely controlled heat and pressure. The fuser rollers heat up to 225°C and in just 23 thousandths of a second, the powered toner reaches its melting point and bonds onto the page. Printer toner is by weight approximately 85% plastic resin. **If burning plastic can produce dioxins, known to be harmful to both human and environmental health, are dioxins emitted through laser printing or the burning of toner-printed paper?**

Integrity

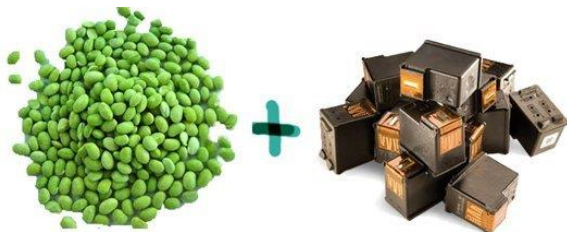
We felt we could not continue the 'Paper Log' Pilot Project with integrity until we had absolute clarity on the potential release of dioxins and approached the main printer toner brands including Brother, Canon, Dell, Epson Hp, Lexmark and Nashua. Two of the manufacturers issued statements.

"When toner-printed papers are burnt in stoves with chlorine contained materials such as salt, dioxins or carbon monoxide may be generated by incomplete combustion. This is not a special phenomenon limited to burning of toner-printed paper and plastics." **Canon**

"Toners supplied by Epson do not generate dioxin-like compounds during combustion of the toner itself. If the toner is burned with other materials which contain halogen then there is a slight possibility that dioxin or dioxin-like compounds might be generated". **Epson**

What alternatives exist such as non-toxic or vegetable inks?

Clearly we would need to substitute plastic-toner formulations and persuade our printed paper supplier to adopt environmentally-friendly alternatives for their office printing requirements. This would produce a safe supply of recycled printed paper for use in the 'Paper Log' Pilot Project, and an opportunity for us and our partner supplier to encourage those in our networks to do the same.



Inspiration

For inspiration we looked to the Newspaper Association of America, since it had developed [soy ink](#) (made from soybeans) in the late 1970s. However it is not 100% biodegradable as it contains other components including pigments, resins, additives etc. Some of these may come from renewable sources but many do not e.g. carbon black is widely used as the pigment for black ink and is classified as a Group 2B carcinogen. Soy ink also contains substantial amounts of petroleum.

Concern

What was of much concern about this supposedly 'less bad' printer ink was highlighted in its role in [abortion in Namibia](#).

"I did not tell anyone, even the boyfriend who impregnated me. I quietly decided to carry out an abortion on my own. For three days, I boiled a lot of newspapers and drank the bitter ink while it was hot. On the fourth day, I started bleeding heavily and this lasted for more than a week. So this time I was successful".

Advella, 19 years old.



Industry expert's feedback

The Sophia Foundation is hugely appreciative of the industry experts who offered their advice and helped bring to light the complexities involved in burning printed paper. Our intention was to carry out emissions tests on 'Paper Logs' made from toner-printed paper, ink-printed paper, and newspaper, but we felt this further research confirmed the risks.

"Relatively low temperature combustion processes, such as with open fires, are simply not capable of destroying the bulk of the harmful elements emitted... Testing for Dioxins can only be conducted in the USA and EU. No Labs in South Africa are accredited to conduct the testing".

Ian Gildenhuys, City of Cape Town

"Dioxins can be encountered when chlorine (in any form) is present and especially when combustion occurs. The acrylic and polyester resin in the ink usually do not contain chloride and is therefore unlikely to form dioxins during incineration... The paper itself may contain chlorine and could lead to the release of dioxins when it is burnt inside a coal stove".

Johan Joubert, EOHS

"The generation of chlorine from bleached paper is unlikely... Bleaching is carried out with chlorine dioxide (elemental chlorine free) because chlorine dioxide has been demonstrated to produce almost undetectable levels of absorbable organic halides (AOX's) (chlorinated organic compounds) and no detectable dioxins, and hence is considered the current best available technology for bleaching, with minimal environmental impacts... Some chlorinated organics may remain which can form minute, undetectable quantities of dioxins, but dioxins are even produced by the burning of wood".

Iain Kerr, Paper Manufacturers Association S. Africa

The advice against the incineration of paper was unanimous among the industry experts. Most papers are 100% recyclable (up to 7-8 times) and are a valuable secondary fibre to the Paper Industry.



Next steps

We are thinking creatively and will be working with designers to elicit ideas for alternative uses for the 'Paper Log' that do not involve burning.

Sobering learning experience

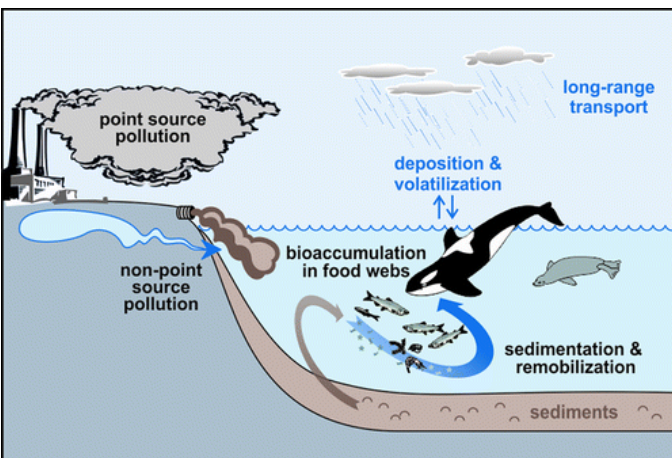
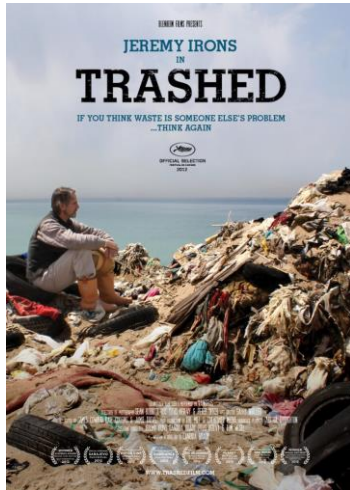
The project has been a sobering learning experience as it has highlighted how unconsciously and with the best intention one can act in ways that are very damaging.

Plastic

Our dependence on plastic is worsening. It is almost impossible to go a day without adding to the immense volume of [plastic waste](#) and yet far too little thought goes into where it ends up or the impact it is having on our fragile eco-system and ultimately our survival.

Plastics do not biodegrade. The associated dioxins, as byproducts of plastic incineration, remain intact in our environment because enzymes are ineffective at breaking them down, and accumulate in the fat tissues of animals and humans.

It is a documented truth that through bioaccumulation the iconic killer whales from the Northeastern Pacific, at the top of the marine food web, are the [most polluted species](#) on the global ocean and Earth. Because of the toxic health effects by persistent organic pollutants on the immune system and reproduction, it is affecting the population recovery of the species.



Source: Alava, J.J., Ross, P.S., Lachmuth, C.L., Ford, J.K.B., Hickie, B.E., Gobas, F.A.P.C. 2012. Habitat-based PCB Environmental Quality Criteria for the Protection of Endangered Killer Whales (*Orcinus orca*). Environmental Science and Technology 46: 12655–12663.

More than **90%**

of [human exposure](#) to dioxins is through food.

"Only we human's make waste that nature can't digest".

Capt. Charles Moore of the Algalita Marine Research Foundation

Our Vision

The world is a sacred place and a sacred process which we are all a part of. We hope this article will lead you to make changes in your life so that together we can cherish the beauty and life force inherent in our planet.

Please [take action](#). Inspire people by making changes yourself and hopefully they will follow...

1. Take care of your teeth and the environment at the same time, choose a non-plastic option
2. Have a nice cup of tea using a biodegradable tea bag
3. Use your local greengrocer or farmer's market
4. Don't drop your cigarette butts
5. Join a local beach clean-up group
6. Take re-useable bags to the shop
7. Get creative with wrapping paper
8. Spread the word!
9. Switch from disposable to cloth nappies/diapers
10. Stop using disposable plastic bottles.

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