Submission

To the Senate Inquiry into the Management of Australia's Waste Streams

Made to the Senate Standing Committee on Environment, Communications and the Arts, by Samuel S. Thompson
Authored in Sydney, N.S.W. May 2008

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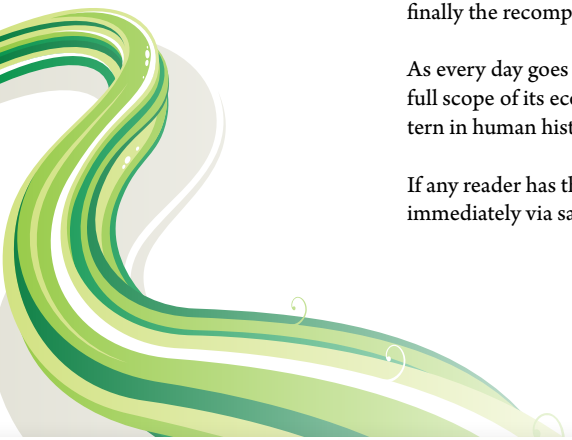
Introduction

This submission is being made in response to the call made by the Senate Inquiry into the Management of Australia's Waste Streams. Many of the concepts, analysis, & solutions presented in this document are the result of a period of research, study, and testing made by the author between June 2007 and April 2008.

This submission deals with the fundamental aspects of Australian life that are both the birthplace of consumer driven product lifecycles and the motivation to manage them in an effective, efficient, and ecologically sustainable manner. In an approach similar to a commercial business strategy, a profile of a lifecycle and an analysis of the key decision makers within the waste stream is made. A perspective on the people and stages in product lifecycles is attained, providing a solid foundation for conclusion, and a clear opportunity for effective remedy. A collection of immediate solutions and supplementary legislation is then proposed, each one of them centred around an all encompassing Framework Manual that provides direction and guidelines for manufacturing, delivery, use, managment & and finally the recomposition of resources embodied in consumer products.

As every day goes by, the increasing level of urgency for action on this critical element of our civilisation grows exponentially. Although it is difficult to predict the full scope of its economic and ecological impact, we have a closing window of opportunity to meet and address these challenges, and redirect this repeating pattern in human history toward an evolved, concious, and resposible community.

If any reader has the knowledge, resources, or collateral available that could contribute to the implementation of the propsed solutions, please contact the author immediately via sam06@th.id.au



Accurately defining waste

Before any analysis is made or solutions put forward, it is critical to establish an exact, educated, and most importantly, a clear definition of what waste is.

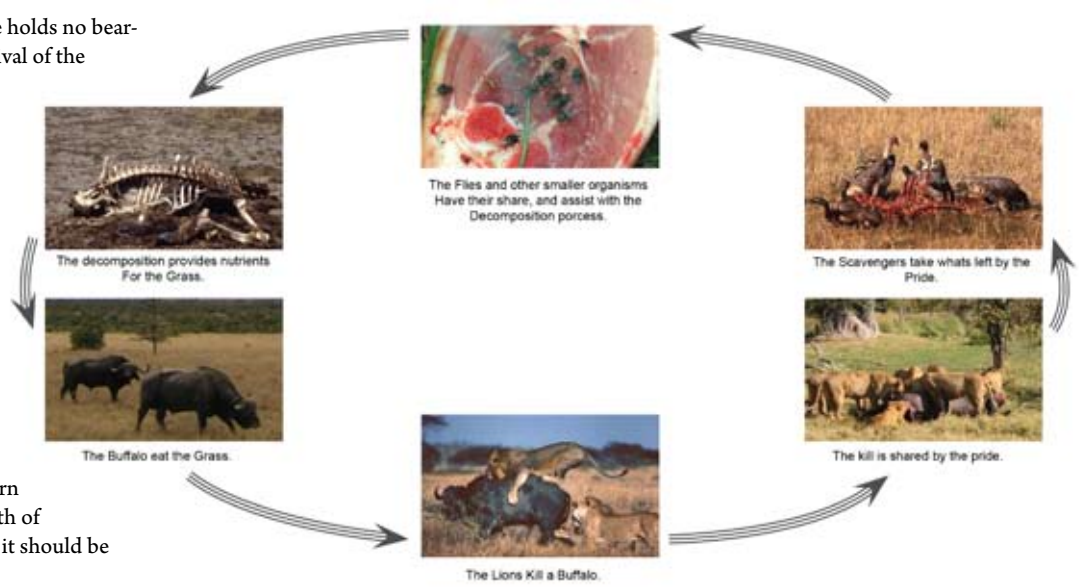
First and foremost, waste is a concept. A concept used in human language as a result of our life style that does not exist anywhere in nature. It is important to remember that we use this concept to describe the things that personally we no longer have any use for. And that it is in our nature to repeatedly forget or fail to take into account, that there is always a purpose beyond what directly benefits us.

Throughout each and evry one of the infinitely diverse ecosystems that cover this planet, the human concept of waste holds no bearing on the constant exchane of nutrients between flora, fawna, air, water and soil. This exchange is critical to the survival of the system and its inhabitants, as every living thing feeds from one another.

To provide clarity to the reader, the following definition will appy throughout:

Waste: *any material or object that has fulfilled the purpose of its current form, and is immediately ready for the engergy and nutrients embodied within it to be harvested, absorbed, and utilised by another stage in the system.*

In other words, a body of material that has served its purpose, only to be renewed and reborn as another essential component of the ecological or technological complex. The example of the death of an African Buffalo has been used to illustrate the point that even in this untimely event, the energy embodied in its carcass is recycled by the predators, scavengers, and insects. The decomposition of what remains, combigned with the faeces from those who fed from it, provide sustenance and nutrience to the grasses in the area, which are then eaten by the buffalo herd. In the event that those particular grasses are eaten by a pregnant famale buffalo, the energy embodied within the newborn have come indirectly from the flesh of its ancestors, and its bodily existence is composed from, and driven by the death of its forebears. Looking at this exchange in this manner will be covered in more detail further into this submission, but it should be highlighted here that this is a map of resources within a closed loop.



How did we get here?

As previously noted, human nature tends to be primarily self focused. Ones survival, the survival of their family, and the logevity of their community are the features of our instinct that have motivated and driven the evolution of human civilisation. In the distant past, crops, livestock, and the people in the communities that tended and depended on them existed in delicate harmony. As people travelled far less than they do today, and basic technologies like plumbing and sewage were yet to be discovered, all the nutrients contained within a community stayed within a closed loop system.

Food scraps had an immense value. Edible kitchen refuse was fed to the chickens, who were able to survive soley on this 'waste' and a minimal amount of water. To look at this from a slightly unusual perspective, these chickens then 'converted' (or recycled) this 'waste' into eggs, which are then eaten by their keepers. Once the keepers have digested the eggs and extracted the energy they need, their sewage is then used to feed the crops, which in turn feeds the chickens etc. Even the eggshells are crushed and fed back to the chickens with their meal, making their future eggshells stronger. This relationship can be thought of as a semi-symbiotic, zero waste exchange of energy. When looked at in the context of the village as a whole, this is a repeating pattern of exchange that benefits all parties directly and significantly, whilst contributing to the system as a whole. There is no pollution, no waste, only benefit.

For the greater part of our history, this is how we lived. Obviously communities all over the world were and still are vastly different, but the fundamental fact remained; every molecule of 'waste' was consumed by another animal or broken down by other organisms and bacteria in the system, then recomposed, or recycled back into a source of energy and life for the next stage in the system.

The concept of waste did not exist.

Communities recognised and respected that they were a part of an energy exchange complex, and that its existence was the reason for their ability to survive. As populations increased across the globe, this balance gradually deteriorated. These villages became towns, then cities, with their food coming in from regional areas, and their scraps and sewage not returning to the point of creation.
The closed loops that had driven development were broken, and the patterns of energy exchange were lost.

Expanding our perspective

Making an inquiry into the managment of Australia's waste streams does run an inherent risk of becoming primarilly focused on what is commonly referred to as looking only at the "end of the pipe". The danger of approaching an inquiry only with this focus is that it dismisses the potential for the inquiry to understand or meet the other challeges and key driving factors in the generation and managment of waste streams, and sidelines them as external issues. The most common complaint from people in the waste managment and recycling industries is that council and governemnetal bodies are direct in demanding water tight solutions from them, without being prepared to put the same amount of pressure on the commercial entities that create what becomes municipal and commercial waste. In making this statement, i'm not in any way trying to call for an inquiry into industrial design and manufacturing systems, or any other topic, i am simply highlighting the fact that this inquiry has the potential to slave those frustrations. If we expand our perspective to look at the entire picture or the "entire pipe", we can see that this is a an issue of immense structure and wide reaching influence. And that approaching it from this mentality allows us to truly remedy the challenges we are attempting to address, rather than implementing a band-aid solution.

Fully understanding how, why, and where, waste is created, is the critical acedemic foundation required to propose potential solutions. We have previously put forward a clear definiton of what waste is, and in order to establish the correct and approporiate forum for evaluation we need to obtain a complete understanding of these three factors. Taking our definition into account, we can see that waste is not created by a consumer, it is created by the designer of the product that they are disposing of. When we take a step back to look at this from a vantage point that provides this wider perspective, we can clearly see that:

"the consumer does not create or generate waste; they are merely the pathway or the section of "pipe" through which it travels."

Looking at the entire picture

This image has been used to illustrate the dangers of looking only at the end of pipe rather than the enitre system. If we declare that the only problem is here, then in this case all we need to do find a way to manage the gas mixture coming out of the exhaust! Not only do we dismiss evaluating the whole, we are declaring that what is creating the waste is unchangable and resigning ourselves as powerless to re-evaluate the system that is generating it.

If we step back and look at the whole, we see that this motorcycle has been designed to run exclusively from petrol, and that is why the waste of energy is occuring. It doesn't matter what we do to contain it post use, the failure is inherent to the design of this product. Furthurmore, the consumer (in this case the motorcycle enthusiast) is not at fault, but the design of this vehicle is. The motorcycle, not the consumer, is the pathway for energy loss.

Mapping life cycles and waste streams

In order to understand and manage waste effectively, we need to access a sufficient level of competance in our approach through a methodology that is able to account in detail for the composition and structure of lifecycles and waste streams. We can do this through by implementing lifecycle and waste stream maps. To illustrate this methodology, lets have a look at an apple tree in a natural ecosystem.

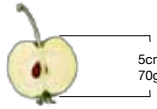
Apple Tree

Goals:

1. Contibute to the development and increased reach and scale of the species by creating seeds for new apple trees.

2. Sustain its own life and continually grow its ability and capacity to perform goal 1.

Products:
Seeds contained within fruit



Product Unit: One average sized peice of fruit

Loop period: One year

Seeding Process - 24 Months
Initial resource investments
Energy/Resouces per Unit
590mls Water
675gr Soil derived nitrogen based nutrients
9500mW/cm² Sunlight

Spring - 3 Months
Initial resource investments

Energy/Resouces per Unit
80mls Water
50gr Soil derived nitrogen based nutrients
95mW/cm² Sunlight over 450 hours

Production level defined
26Units/m³ Size v production ratio

Summer - 3 Months
Production capacity reached

Total - 260 Units
80mls Water,
50gr Soil derived nitrogen based nutrients,
95mW/cm² Sunlight

Product appeal created
8g Sugars/Unit Increased from 0g.

Autumn - 3 Months
Distribution

Gravity induced droppings
90% - **234 Units**
Wildlife extractions
10% - **26 Units**

Wildlife extractions - 10%
Seeds dirstibuted by movement and droppings.

Energy investments recovered - 90%

Winter - 3 Months
Decomposition

Raw resouces recycled per Unit
80mls Water
90gr Nitrogen based nutrients

Recovery level defined
70% 1st following loop period
30% 2nd following loop period

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Mapping the end of pipe only

If we only look at the end of pipe, this is all we see. Our vision of the whole is lost. It is impossible to see the potential for recovering energy investments and recycling them into new products, because we do not know how what these new products are made of. We don't know where they're being made, when the resources are needed, in what form etc.

"In order to effectively manage Australia's waste streams, we must step back, pull our heads out of the end of the pipe, and acknowledge that only when we can manage the whole, can we manage a section of it."

This may sound like a gargantuan task, but it is suprisingly simple. We don't need to do any more research, surveys, or inquiries. All we have to do is replicate nature. The systems we need have been operational for millions of years, its just they operate so slowly, smoothly, and silently that it all happens right before our eyes and we hardly notice.

Nature doesn't deal with the end of pipe, because it doesn't exist. In natural environments the end of one pipe is the beginning of another, which continues perpetually because it is able to account for every molecule in the system. We have the technology and the resources to do this now, all we need to do is shift our perspective to a vantage point that exhibits this level of understanding.

Autumn - 3 Months
Distribution

Gravity induced droppings
90% - **234 Units**
Wildlife extractions
10% - **26 Units**

Wildlife extractions - 10%
Seeds dirstibuted by movement and droppings.

Energy investments recovered - 90%

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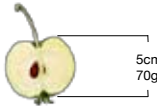
Commercial life cycles and waste streams

Using our mapping methodology, lets look again at the same system component, but this time in the context of a commercial orchard. We will keep all the same values per unit as a natural habitat, and develop a clear map of the resource pathways. Notice how in this context, if we want to see the whole we would need to zoom out really far, as the pathways are now much longer than in a natural habitat. We also notice that the closed loop has been lost; the tree no longer recovers its energy investments, and it seasonally requires energy from external sources. Also note the addition of fuel and insecticide, as needed by the farmer to support his level of production, but not needed by the trees to grow fruit. It is also critical to highlight that we have not taken into account the lifecycle pathways of the tractor, fuel, or insecticide, so this is an incomplete representation of the complex of systems.

Apple Grower

Goals:
1. Grow as many apples per season as possible.
2. Sustain its own life and continually grow its ability and capacity to perform goal 1.

Products:
Fruit



Product Unit: One average sized peice of fruit

Loop period: One year

Seeding Process - 24 Months
Initial resource investments
Energy/Resouces per Unit
590mls Water
675gr Soil derived nitrogen based nutrients
9500mW/cm² Sunlight

Spring - 3 Months
Initial resource investments

Energy/Resouces per Unit
80mls Water
50gr Fertiliser derived nitrogen based nutrients
95mW/cm² Sunlight over 450 hours
0.5L/m² Fuel required

Fertilizer
15g/Unit
Spread using tractor.

Production level defined
26Units/m³ Size v production ratio

Summer - 3 Months
Production capacity reached

Total - 260 Units
80mls Water,
50gr Fertiliser derived nitrogen based nutrients,
95mW/cm² Sunlight
0.3L/m² Insecticide

Product appeal created
8g Sugars/Unit Increased from 0g.
Brand Marketing 60k com. spend

Autumn - 3 Months
Distribution

Handpicked sellable fruit
98% - **254.8 Units**
Unfit fruit and droppings
2% - **5.2 Units**

Harvest Wholesale Rate - 98%
Product distributed by client.

Energy investments recovered - 0%

Winter - 3 Months
Decomposition

Raw resouces recycled per Unit
0mls Water
0gr Nitrogen based nutrients

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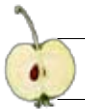
Municipal life cycles and waste streams

Staying with apples, we are now looking at its life within a municipal waste stream. For this example, the person buying and eating the apples lives in an apartment, so they don't compost their kitchen scraps. To add another level of depth to this analysis, the key decision maker, the person buying the apple is an environmentally concious city dweller, and chooses to buy organic apples, uses green bags, and is generally environmentally motivated.

Important notes:
- All of the energy contained in the 30% of the apple that wasn't eaten is being trucked to landfill, instead of being reused.
- More fuel has been required for the transport of the apple to the shop, to the home, and then to the landfill site.
- Despite any environmental motivation of the consumer, all of these energy losses continue to occur.

Apple Buyer

Goals:
1. Eat apples.



5cm av. spherical diameter,
70g av. weight

Products:
Energy

Product Unit: One average sized apple
Loop period: 7 days

Phase 1 - 3 Months
Initial resource investments

Energy/Resouces per Unit
45 cents $AU
0.01L Fuel required to drive to shop

Consumtion level defined
4Units/Week

Phase 2 - 10 Minutes / Day
Eating

Product use defined
60g Sugars
40g Fibre

Phase 3 - 24 Hours
Digestion

Components absorbed
57%, 13% not digested
Refused
30%

Contribution to landfill - 30%
Distributed by local council

Contribution to Sewage - 13%

Energy investments recovered - 0%

Winter - 3 Months
Decomposition

Raw resouces recycled per Unit
0mls Water
0gr Nitrogen based nutrients

Transport fuels 0.3L/Unit
Via road transport

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Understanding the Key Decision Makers

At all stages in a product lifecycle and waste streams, a person or group of persons make a decision as to how they will create and/or deal with waste. These people or groups can be thought of as Key Decision Makers or KDM's. Keeping within our apple market, we are going to define and profile them, then analyse their motivations.

From this analysis we will uncover the first signs of a solution; the opportunities to understand, and influence KDM's.

In the case of the apple, there are three KDM's that contribute to the lifecycle. The farmer, the commercial buyer, and finally the consumer. There is also the role of the local council, but to obtain some sort of brevity we will focus intially on these three. Each one of them determine how the product is created, how its derived waste and the waste gererated in its lifecycle is managed, and whether or not it is financially and environmentally sustainable. There are so many complex compents to psychographic profiling, but we will look primarily at the major factors that drive decision making by these three people, to uncover exactly what situational changes are required for them to change their behavior. I urge the committee to include this style of anaysis with their thought processes, as it provides a personal dimension to statistical analysis and an increased and often overlooked level of understanding.

Understand KDM's

The first KDM we will look at is the producer. In this case the apple farmer.

Apple Farmer

Decision drivers:

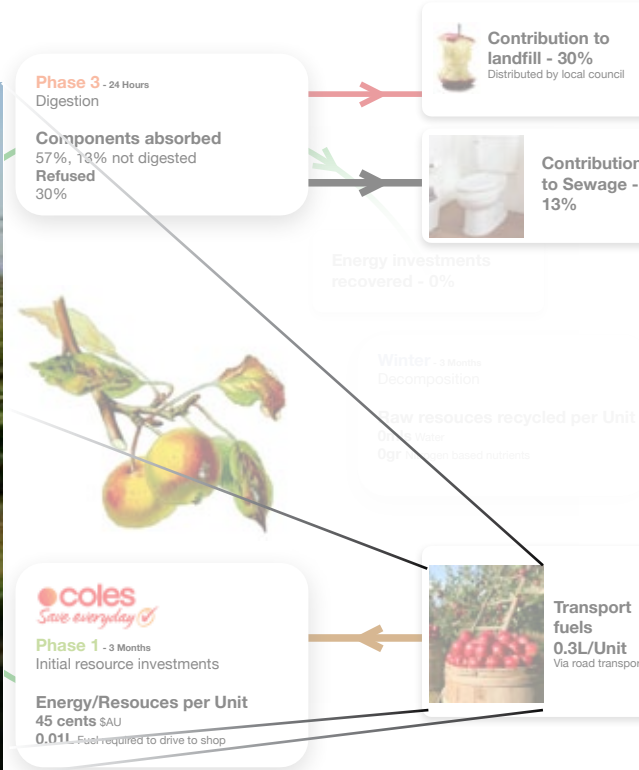
1. Manage a profitable business
2. Deliver consistent product to customers
3. Minimise expenses
4. Minimise environmental impact

Products:

Apples

Bulk Required Resources:

1. Fertilizer
2. Irrigation
3. Machinery
4. Fuels
5. Insecticide
6. Sunlight



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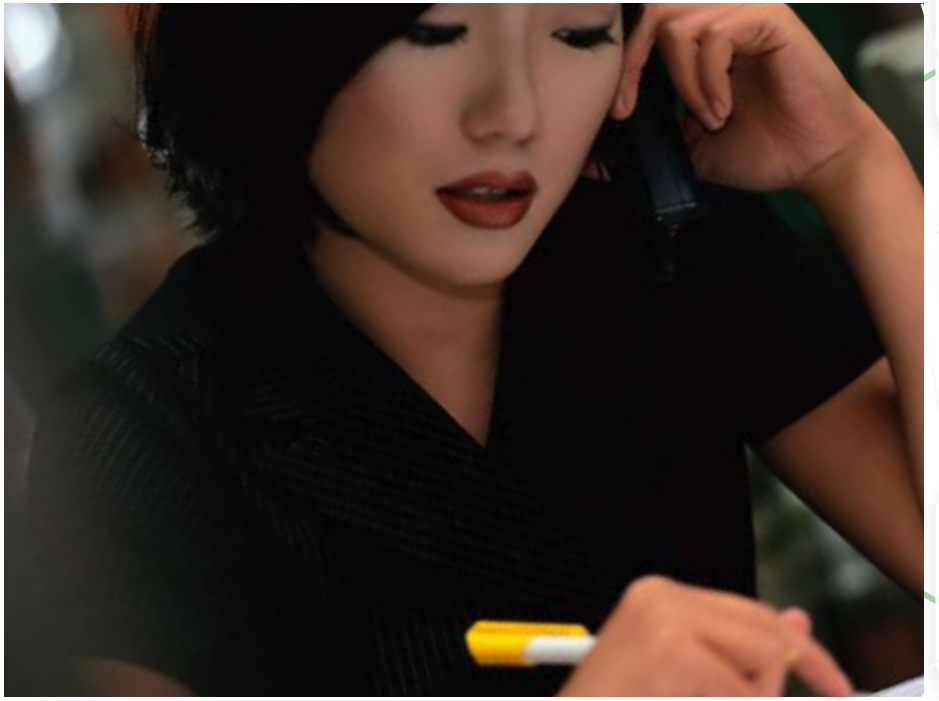
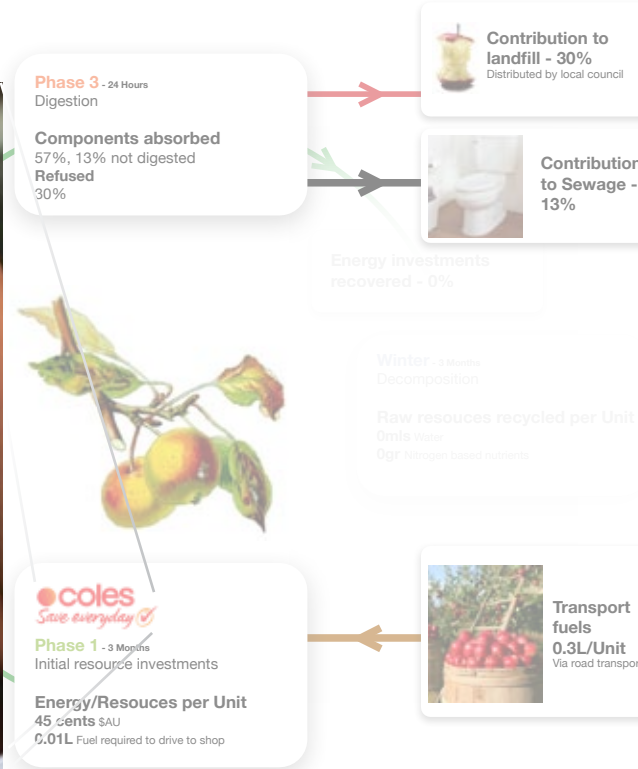
Understand KDM's

The next KDM is the commercial retailer, who chooses which farm to buy from.

Apple Retailer





Decision drivers:

1. Manage a profitable product channel
2. Deliver consistent product to customers
3. Minimise costs

Products:

Apples

Bulk Required Resources:

1. Capital
2. Electricity
3. Paper and various communication systems

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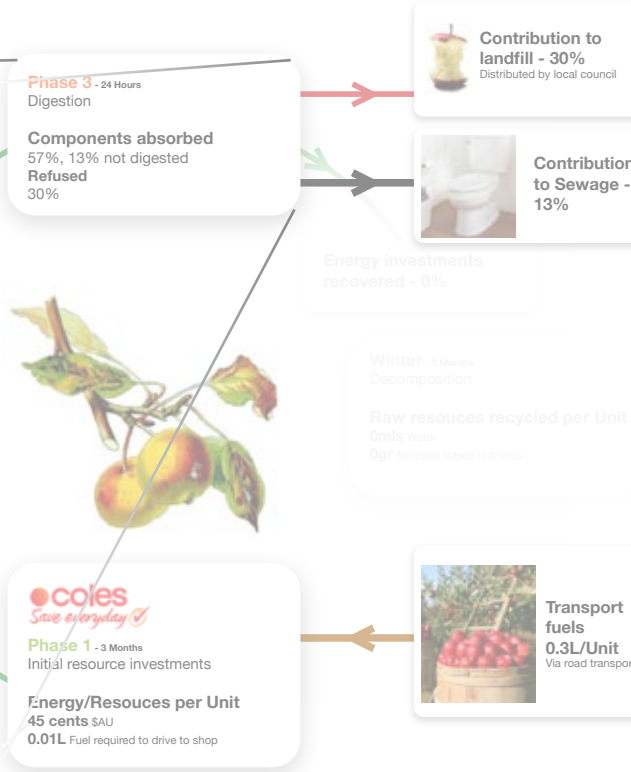
Understand KDM's

The final and KDM is the consumer, who drives the entire market through their actions.

Consumer



Decision drivers:

1. Eat apples
2. Buy the desired kind (green/red, organic/non-organic)
3. Minimise costs

Products/Waste:

Apple Cores
Sewage

Bulk Required Resources:

1. Apples
2. Electricity
3. Vehicle and fuel

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Understand KDM's

Each KDM profiled here has two things in common-

1. The desire to minimise cost.

2. They require resources and generate unused waste.

Drawing from our discussion of closed loop systems in which embodied energy is leveraged post use, we can see already that there is defniately an oppotunity emerging here to align the waste being generated by the consumer, with resources required by the farmer.

This would bring down his procurement expense, and in turn provide savings to the retailer and consumer, which talks the parties most common desire. It is important to note that although each party may have differing levels of concern for environmental issues, they all share the same level of motivation to minimise cost, which presents the first key vehicle to drive change.

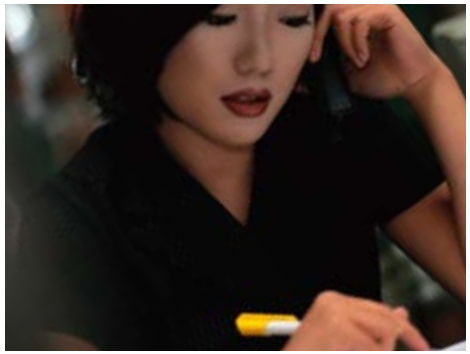
It should also be highlighted that the consumer has the highest level of influnce and ability to alter the system. If her apple experience does not meet her expectations, her business will go elsewhere, destroying both the retailer and farmer. The power of the consumer is paramount. A great example of this is the sales of organic foods, of which 5 years ago could only be purchased from specialists. Now they are available in most major supermarkets alongside non-organic goods. Consumer driven shifts drove this change.

Apple Farmer

Decision drivers:
1. Manage a profitable business
2. Deliver consistent product to customers
3. Minimise expenses
4. Minimise environmental impact

Products:
Apples

Bulk Required Resources:
1. Fertilizer
2. Irrigation
3. Machinery
4. Fuels
5. Insecticide
6. Sunlight



Apple Retailer

Decision drivers:
1. Manage a profitable product channel
2. Deliver consistent product to consumers
3. Minimise costs

Products:
Apples

Bulk Required Resources:
1. Capital
2. Electricity
3. Paper and various communication systems

Consumer

Decision drivers:
1. Eat apples
2. Buy the desired kind (green/red, organic/non-organic)
3. Minimise costs

Waste:
Apple Cores
Sewage

Bulk Required Resources:
1. Apples
2. Electricity
3. Vehicle and fuel

Commercial factors

Following a dive into lifecycle and waste stream analysis and mapping, we must also consider the inlfuences on commercial organisations and what drives changes in its behaviour.

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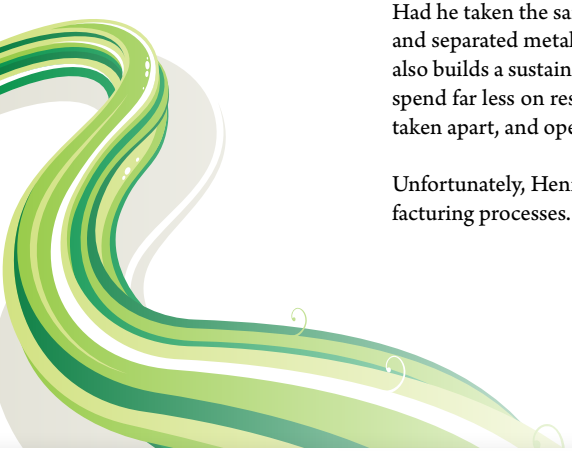
The industrial revolution & the business model

This is not a report on history, so this page will be concise, but i want to quickly touch on the concept of a commercial plant and its role in the industrial revolution to give us a hightened understanding of the manufacturing frameworks we have today. For our example, lets use the legendary Henry Ford. Following the success of his Model T, Herny Ford envisaged a grand dream. He conceived an idea for a huge manufacturing plant, one that could produce every component for the Model T, assemble it completely, and do so at a pace that would make your jaw drop. In his vision, which he (along with hundreds of other people i might add) did build, metal, rubber, and cows went in one end, and cars drove out the other. It was an incredible concept and his methodology lives on today in manufacturing plants all over the planet.

I have used this example to demonstrate to the reader the critical issue - Huge amounts of money were invested in refining the resources needed to build the product. When a car was sold, although the price gained a profit on its cost, the money invested in those resources drove out the door, never to return. It is well known that it is far cheaper and much faster to melt down metals rather than mine and refine them, but Ford was not concerned with this, as their expenses were already covered by the price.

Had he taken the same approach as nature, he would have set up a second one of his famous production lines, but in reverse. Superceded cars would go in one end, and separated metals and rubber would come out the other, feeding back into the beginning of its sister system (obviously in this utopian vision of this era Henry also builds a sustainable leather and beef farm next door!). Given, his capital expenditure on this disassembly line would have been massive, but over time he would spend far less on resource procurement and dramatically increase his profit margin. Over time he would learn to design his components to be simply and quickly taken apart, and operating this side of the plant would become much emore efficient and profitable.

Unfortunately, Henry Ford's world was not as amazing in its ability to evaluate the potential of environmental impact as it was in its enginuity for designing manufacturing processes. Luckily, today we are.



The endangered economy

Resource (or waste) recovery and managment competance will determine which commercial players of today will survive in the economies of the future. If Henry Ford were around today, I very much doubt that a man of his genius would be building that plant without the supplementary disassembly line. It would be commercial suicide. Driven by growing markets and continued need in established ones, miners have experienced massive demand and exponential growth in production and sales. We all know that there is only a certain amount of metals in existence on the planets surface, and that if we continue on this path, we will come to the end of the line. At which point, if they are able to survive through the market collapse the miners will then begin frantically buying up landfill sites and rifling through the refuse of short sighted generation, only to learn that had their grandfathers acted when the warning lights were flashing they wouldn't be fighting each other for a new market position.

It amazes me everyday the amount of rhetoric being thrown around about the 'environmental risks of global warming' and even more so 'humanities dependance on oil' and how little attention is being applied to the real economic and social impacts these issues present. We are starting to see the impact of oil being over $100US a barrell, and to the shock of some people it doesn't just affect how much consumers pay at the petrol station, it affects the cost of anything that is transported or created using a combustion engine, and most item that contain plactics; which in western society is nearly everything. We are only starting to see the economic impacts of these shifts, but when they gain more momentum and the markets adjust to the changes, the impact to our lifestyle will be catastrophic. This is not a prediction either, it is already happening in countries like haiti where food is becoming scarce due to these issues. Of course this is a generalisation, but in the western world we like to consider ourselves as seperate and somehow away from the reach of these issues - just look at the expression 'western world' - which directly states that there are two! But we need to drop that immediately if we are going to avoid these risks. We need to ackgnowledge now that what happens on this planet affects ALL of its inihabitants, and we need to change our fundamental approach to nearly everything we do.

"The world will not evolve past its current state of crisis by using the same thinking that created the situation"

-Albert Einstein

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Commercial strategic thinking

When we are looking at commercial product lifecycles and waste managment, it is important to consider the processes around commercial strategies and business models. We have talked about the business model born during the industrial revolution, and following our analysis of natural waste loops we can see that this model is against the formula applied by nature. Industry grew this way mainly because of a lack of understanding of the concequences of a one way channel, and that it was widely thought that the world had so much of everything that we would never be able to use all of it.

Business is motivated by one thing - profit. First and foremost, if a business can not turnover enough to sustain its operations, it will fail. This ability to turnover a profit is also driven by one thing - customer expectation. Going back to our discussion on the Model T, Ford's customers expected to buy a vehicle that was well built, sturdy, and not drawn by a horse. They generally did not have any concern for environmental impact, they knew what product they wanted, and the Model T delivered.

We know that businesses are driven by consumer desire, we saw this in the case of aerosol cans and the hole in the ozone layer. Customers became concious of the negative side of the product, businesses changed the way they made the product. We narrowly avoided and environmental disaster, because businesses are driven by what consumers want. This issue we face today, is that effective waste managment and it's impact on environmental systems is a very complex issue, and although almost everyone wants to consume responsibly, most average consumers do not fully understand the complexity or scope of the issues.

This presents a massive issue for the managment of Australia's waste streams. As we will cover in the next few pages, it is incredibly simple to add environmnetal "value" to a product, without doing anything at all to change the way it is made or what it is made from. Marketers know this, they are trained to find creative ways of communicating intangible benefits, and we are seeing hundreds of examples hit supermarket shelves year on year. Consumers are being manitpulated into thinking they are doing the right thing, when in most circustances the product is the same.

Green wash

Building on our discussion around commercial strategic thinking, we are now going to have a look at how this kind of thinking presents issues and opportunities for effective waste managment in Australia.

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Green wash

This is the single biggest threat to navigating a shift on the scale that is required to effectively manage our waste.

When companies add an element of environmentally motivated 'benefits' to a product, not only does it intentionally mislead the consumer, but it completely undermines any genuine claims made by closed loop sustainable products. They know that doing this will instantly give them a competetive advantage, and there has been many instances where extremely destructive products are able to confuse the consumer and appear cleaner than they are. There are a plethora of examples, so we will only cover the biggest dangers:

Issue #1

The most common example would be adding the text "recycleable packaging", which makes you think 'wow, this company cares about the environment so much that they are designing this packaging to be recycled.' When in actual fact, the product can still be made from virgin plastics or paper, and if it is recycled, it would be of an inferior quality and unfit for repeated use in a similar product. This product still damages the environment at every stage of its lifecycle, yet the consumer is led to beleive that they are buying resposibly.

Issue #2

"Carbon neutral" & "Carbon Offset"

This is very simple. Planting tree seedlings does not change or have any measurable effect of the atmospheric destruction caused by pollution. Those trees won't be big enough to absorb that much CO2 for decades, by which time, the amount of CO2 would have increased so much that millions more would need to be planted to soak it all up. Although it is a positive thing to plant a tree, it doesn't change the fact that the flight you are on is pumping toxic gas into the atmosphere, your bottle of water is still made from crude oil, and it will take thousand of years to decompose in a natural system.

Issue #3

Recycled content. Lets imagine a bottle of water, made from PET plastic, declaring it is made from recycled content. The environmentally motivated consumer would be happy to pay more for this product, under the impression that they are doing te right thing for the environment. Now although it didn't require virgin crude oil to produce the plastic, the facility that recycled the bottle could be powered by coal energy, it could be bleaching the plastics and not managing it chemical disposal properly, it could be doing an infinite amount of irresposible things, and the consumer is totally unaware. Their action has still caused massive environmnetal impact, despite all their good intentions.

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The product development process

As we have recently discussed, business are driven by what a consumer wants. Following a determination of what market you are targeting, the first consideration is what does the consumer desire. You look at your supply chain, you look at your systems, you leverage your capabilities to capitalise on this desire.

The point of conception is where the product takes shape, and this is where we need to focus our efforts if we are going to effectively manage the waste generated by the product. This is the only point where we can implement effective stratgies to create sustainable products. The teams that manage this process are very smart people, and their ability to adapt to and meet challenges and shifts in the market is what has delivered their success, it is with these people and at this point in the lifecycle that we have the opportunity to drive change.

The design brief

“Sell my product!”

When you design a product, you first formulate a design brief. This is the guideine of what the product is made of, how it is made, how it will look etc. They can be as complex or as simple as the client desires, and i have been given such a range that it is impossible to define a standard. But in essence, it is designers guidelines that can’t be broken by the creative process.

In terms of packaging, I’ve been instructed to design a particlar shape or size that will pack easily, one that will use minimial ink, one that will be simple to assemble, the list goes on and on. One thing that i have never been asked to do is design something that can be disassembled easily, or design something that can be recycled effectively.

Even if i had, i would be doing so ‘in the dark’ so to speak, as i have searched far and wide for a framework to apply to design to no avail. If i had, i could apply its values without the client even being aware, as their concern is based on their ability to sell the item you are creating, and as long as incorporating these features didn’t restrict this ability, they would not even notice. The job of a designer is to creatively meet these kinds of challenges every day. Applying and implementing a framework for sustainable design would not be a shock nor would it inhibit the design process. It would stimulate innovation, and drive change.

Moving away from current thinking

If we are going to effectively manage our waste streams and product lifecycles, we need to move away from what we have accepted in the past, and acknowledge that we need to develop and implement a new level of thinking.

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1. The symbiotic Matrix

We must acknowledge that just like natural ecosystems, the industrial systems and networks across the globe are interconnected and interdependant.

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2. Imitating Nature

Once we have acknowledged the system, we need to work together to imitate nature, and implement the same level of resource recovery for each and every resource in existance.

3. The value of embodied energy

We have already discussed embodied energy and now we need to find secure ways for companies to recover their investments in resources.

4. the potential of multi dimensional alignment

Once we have created and proven a formula for investment recovery, we need to the connect all the stakeholders within resource pathways and allow then to align their commercial calendars. This will stimulate a connected and concious network, and deliver tangible, lonf term supply chain security.

Zero Landfill Project

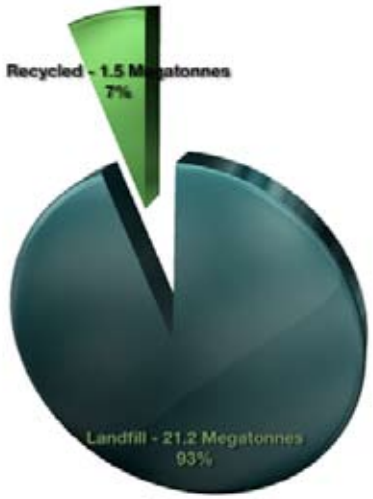
Analysis of household waste streams - Frameworks to acheive zero landfill

What this is about

From humble beginnings, recycling activities have grown from being generally disregarded to being widely accepted and implemented in some form by nearly every Australian household. In March 1996, 91% of Australian households engaged in some form of waste recycling and reuse activities at home, resulting in 7% of the total waste generated in the financial year '96-'97 being recycled. By '02-'03, 46% of the total waste was recycled, respresenting a massive shift and dramatic increase in the rate of recycling in Australia.

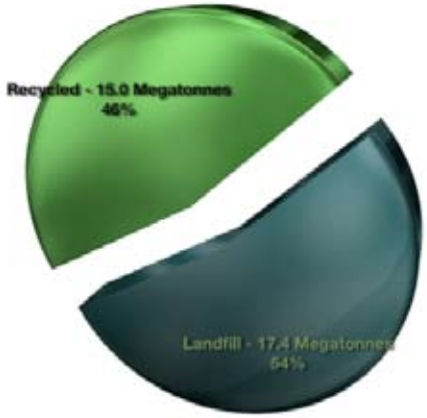
However, over these six years, the total amount of waste being generated increased by 30%. Our amount of recycled material increased from 1.5 megatonnes to 15 megatonnes, but our amount of landfill decreased from 21.2 megatonnes to 17.4 megatonnes. Despite the percentage of total waste being recycled increasing by 39%, the total landfill was only 18% less than six years earlier, and still more than half of our waste. What is clear from these figures is that although our rates of recycling have increased significantly, so too has our total amount of waste being generated. Given current and projected population increases, this will continue.

Aim: Identify and define what we are contributing to landfill, then establish systems to recycle it.



1996 -1997

- Landfill - 21.2 Megatonnes
- Recycled - 1.5 Megatonnes



2002 -2003

- Landfill - 17.4 Megatonnes
- Recycled - 15.0 Megatonnes

Australian Bureau of Statistics, Document 4602.0 • ENVIRONMENTAL ISSUES : PEOPLE'S VIEWS AND PRACTICES • March 2006

Department of Environment and Heritage (DEH) 2006 submission to the Productivity Commission Inquiry into Waste Generation and Resource Efficiency; DEH data published in the Productivity Commission 2006, Waste Management, Report no. 38, Canberra.

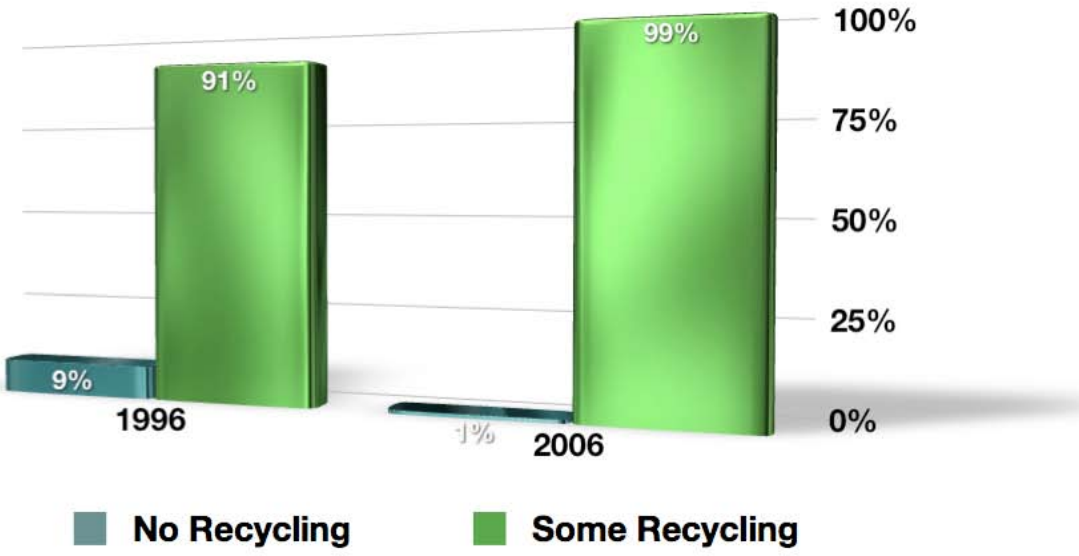
Zero Landfill Project

What this is about

The motiviational stimulus behind this document lies in the fact that although as a community we may not be recycling the total volume of the waste we generate, on a personal level we all are motivated in some way to make an effort to recycle part of it. Exactly what motivates us, how much we recycle, and the methods we employ are as unique and diverse as we are as human beings, but fundamentally; motivation and convenience are the critical factors in anything new that we incorporate into our lives.

Both these factors expose two massive areas of commercial and environmental opportunity. If we can develop a model that meets both of these factors in a flexible and dynamic manner, test and apply this model to a range of situations, we can develop a framework to acheive zero landfill.

Australian Bureau of Statistics, Document 4602.0 • ENVIRONMENTAL ISSUES : PEOPLE'S VIEWS AND PRACTICES • March 2006



Zero Landfill Project

Case Study:

In Our Home

In our house we make an active and commited effort to recycle everything we can. To help us manage our current level of separation, in our kitchen we have one bin for paper, one for glass and metal, and a third bin for garbage. After doing some reseach, we learned that many of the things we put in the garbage bin are actually recyclable, and that we've sent a lot of stuff to landfill could have actually been used. This has motivated us to understand why this is happening, and how we can minimise and ultimately end our contibution to landfill.

Our Goal: **Reduce our contribution to landfill to zero; through education, resource separation, and managment in the home.**

Paper

Glass & Metal

Landfill

Case Study:

48hr Bin Audit

Over a 48 hour period, the house was business as usual, except that everything going into the bin was recorded. This produced an interesting body of data, and allowed us a clear outlook on what we are currently sending to landfill.

Zero Landfill Project

48hr Bin Audit

Landfill

Results:

Foil (from chocolate wrapper)
Plastic (wrapper from nuts)
Plastic (strawberry punnet)
Foil (butter)
Plastic (popper pourer)
Elastic (off ham)
Plastic (salad bag)
Plastic/Foil (chocolate wrappers)
Cigarette Butt
Cooked Bones
Plastic (cat food pack base)

Results:

Foil (cat food pack cover)
Plastic (dog food bag)
Plastic (drinking straw)
Plastic (meat wrapper)
Plastic (Glad wrap mushroom packaging)
Plastic (orange net/bag)
Plastic (cat/dog flea treatment tube)
Plastic (ink cartridge)
Plastic (broken pegs)
Nappies
Plastic/Foil (ground coffee packaging)
Plastic (meat wrapper)

48hr Bin Audit

Landfill

Results:

3 Categories

Plastics

Plastic (wrapper from nuts)
Plastic (strawberry punnet)
Plastic (dog food bag)
Plastic (drinking straw)
Plastic (meat wrapper)
Plastic (Glad wrap mushroom packaging)
Plastic (orange net/bag)
Plastic (cat/dog flea treatment tube)
Plastic (ink cartridge)
Plastic (broken pegs)
Plastic (cat food pack base)
Plastic (popper pourer)
Plastic (meat wrapper)
Plastic (salad bag)
Plastic (meat wrapper)

Foils

Foil (from chocolate wrapper)
Foil (cat food pack cover)
Foil (butter)

Special

Elastic (off ham)
Plastic/Foil (chocolate wrappers)
Cigarette Butts
Cooked Bones
Nappies
Plastic/Foil (ground coffee packaging)

Zero Landfill Project

Segregation Testing

Following our audit, i realised from analysing the results that the majority of the items going into landfill via our bin were recycleable, and that if we could just separate them and find a way to get them to recyclers, then we could significantly reduce our contribution to landfill. The key here would be a way of doing this that doesn't negatively disrupt lifestyle, and works in our kitchen without any other changes. To give it a bit more credibility, the Test Bins Program was performed in 5 different homes, with very different families. For the period of the test, the regular rubbish bin was taken outside and not used, and the families were provided with an educational dvd and handbook that aimed to answer any questions they may have.

Each resource category was branded with a logo and a colour, and this identity was applied consistently to the educational materials and the section of the bin dedicated to that category.

Test Bin Program: Test the viability of segregating the contents of a family rubbish bin.

Zero Landfill Project

Test Bin DVD

The DVD was designed to be a part of the test that would be an interactive educational tool that the younger family members would respond to and learn from. It covered primarily that same information as the booklet, but appealed more to a person who didn't want to read it.

Zero Landfill Project

Test Bin Handbook

The handbook was aimed at the older family members, and proved to be an effective method for answering their immediate questions.

Zero Landfill Project

Test Bin

Although it was rather crude in its design, the bin was made from materials that we recycled post use, plastic bags that were biodegradable, and had a section for each waste category.

Zero Landfill Project

Results

The most interesting aspect of the results was that every family was not only motivated, they were genuinely excited to be a part of the test project.

Each family said it had a massive impact on their waste management, brought more awareness to their consumption, and actually made them recycle more of what is currently collected by their local council.

Zero Landfill Project

#1
Test Bin Review:

FAMILY: Kennedy
Location: Corrie Road, Alpine
Start Date: 4.1.08
End Date: 19.1.08

Test Period: 15 Days

Household Composition:
2 Adults, 3 Children (aged 14, 18, and 21)

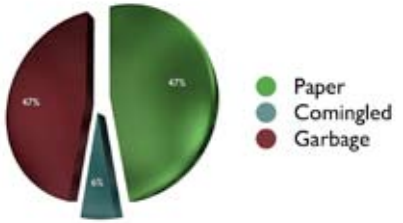
Resources currently being recycled:
Paper, Cardboard, Plastic bottles, Aluminium and Steel Tins, Compost

Estimated Volume of council collected Garbage:
x2 1000L Garbage bins **per Month**

Estimated Volume of council collected or delivered Recycling:
x2 1000L bins of Paper and Cardboard **per Month**
x1 240L Council Collected Comingled Recycling bin **per Month**

Estimated Total Waste per Month: 4240L

Waste breakdown per Month



What impact did the Test Bin have on your family?

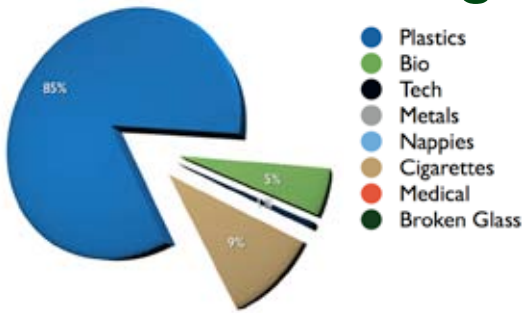
Having the bin brought much more awareness about what we could and couldn't recycle under our current council provided service. We realised how much landfill our family was helping to suppy. This exercise helped us to realise how much more support our council could be providing.

Reveiw Questions:

Did the test bin have a section for all of your waste?	**YES**
Was the test bin easy to use and understand?	**YES**
Was it the same for your children?	**YES**
If a bin was provided to you by the council that was segregated like the test bin, and practical for your household, would you be willing to use it permanently?	**YES**

Test bin composition breakdown
Total weight of contents:

528g



Zero Landfill Project

Conclusions from the test bin project

Although there were a number of objectives, the main goal of the Test Bin Program was to determine the viability of:

- Destroying the concept of "waste"
- Introducing a segregated system that could replace the rubbish bin

From my data and discussions with the families, this is completely viable and each of them would be prepared to adapt their waste management systems to this new addition.

This whole system could be provided by commercial business, who would profit from collecting the separated resources and selling them to recyclers. The contractor could provide the bin, and pick up the resources regularly without any financial burden on the local council.

Alternatively, the system could be managed by the council, who would benefit from reduced landfill costs and profit from on selling resources.

If this system is introduced across the municipality, the state, even the nation, the contribution to landfill will eventually be zero.

Immediate Solutions

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Resource Separation

Nationally implementing a system like the Test Bin project would both destroy the public perception of waste, and provide an avenue for the complete recovery of embodied energy. Getting rid of our concept and even our belief that there is such a thing as useless waste is the first step in moving forward.

It would stimulate innovation, drive economic growth, and end our need for landfill.

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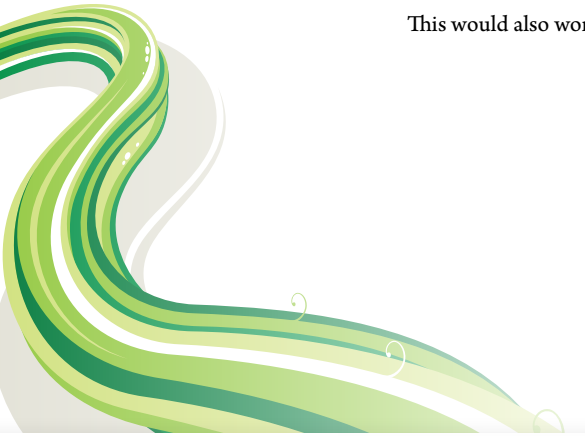
Consumer & Producer Collaboration

Develop “national resource ponds” that are contributed to by consumers and businesses.

For example, lets look at biological waste. Most city dwellers buy their vegetables from supermarkets or markets. Imagine if the chain or the market as a collective provided the consumer with an effective bin to collect all their food scraps, and easily allow them to transport them back to the supermarket. When they arrive at the deposit box, their contribution could be weighed, and the would receive a discount on their next purchase from a pond scheme partnered supermarket proportional to their contribution to the resource pond.

This would also work for metals, plastics, and all resources that are used to make consumable products.



Standards & Regulation

In order to allow consumers to make responsible decisions, we need a set of national standards that define things like “environmentally friendly”, and “recycleable”. Green wash is an epidemic and the green rush has resulted in massive amounts of confusion and clouded messaging.

The above identification brands are probably less than 1/10th of what out there. We need a singular, federal government backed brand, that allows consumers to know without any shadow of a doubt what they are buying. A brand that supercedes all others, that consumers can immediately trust:

SUSTAINABLE

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The Framework Manual

For environmental and commercial symbiosis

SUSTAINABLE

The Framework Manual

Each and every environmentally committed KDM in the Australian economy needs to be given access to and contribute to a publicly owned, all encompassing framework manual that provides strict and direct guidelines for how to design and manufacture products and packaging for effective recycling and recomposition.

A document that is dynamic, constantly evolving and growing. If you intend to use the aforementioned branding, you must make a legal commitment to holding to all applicable guidelines contained within the manual. If you don't, hefty fines will apply. It must contain design briefs that cover all products in all industries, and leveraging new web technologies, subscribers could access a website, enter their project details and have a brief generated automatically for them.

Each user must feedback to the management teams when any aspect of the manual needs to be reviewed, very much in the same vein as Wikipedia, the Manual will be a document that is created by all Australians.

Even if your business is not ready to commit, the document will still be available to you and you can use it to redesign your systems prior to making a commitment.

The government needs to commit funding to this concept. A central 'bible' of this information is the foundation needed for a closed loop economy.

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Conclusions

I must admit that this submission was quite hastily put together, as i only learned about the Inquiry close to the cutoff date. It is therefore, quite incomplete, and i was unable to include the bulk of my Test Bin Program and its results, and i would have liked to go much deeper into the design guidelines in the Framework Manual and how it imitates nature for commercial benefit. I truly believe that we can do this, but is going to take a lot of work and the first step is admitting that we don't have the answers, and launching ourselves on a journey to find them. I would be honored and privileged to give evidence or further exposition of my work to the Inquiry.

Thank you for your time.

Samuel S. Thompson
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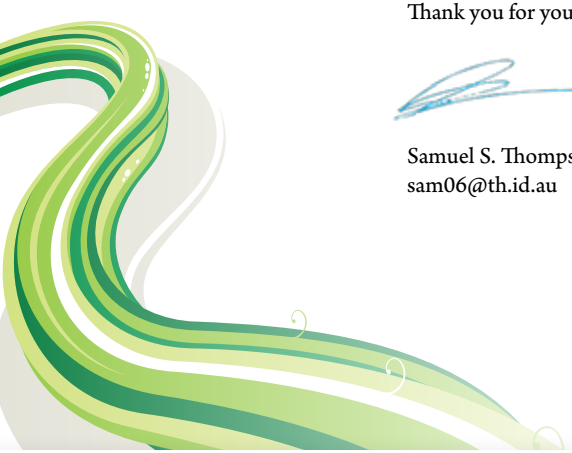

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