Beyond the 'tipping' point

Once upon a time every item dragged into a home was put to some use or other. This still happens in some far away lands, but down here in Australia things changed for the worse long, long ago.

Since well before *WME* came to life, there's been a rising tide of waste. This has not gone unnoticed, however, being both cause and effect of the shift in thinking about 'the environment'.

People are now more aware of issues such as resource depletion and climate change. While there are few signs consumption is on the wane, environmental concern is most keenly expressed at the end of product life through opposition to landfilling the leftovers.

These two factors have combined to craft a multi-billion dollar waste management and recycling industry. They have given rise to stronger regulation around how material is collected, transported and treated, and have encouraged plenty of technological innovation.

While pressure from Joe Public has been largely responsible for the shifting landscape, the resulting changes have had a major impact on industrial waste generators too. Market-based instruments like landfill levies have increased the cost of waste disposal across the board.

Waste management is still a tiny part of most company's operating costs, although there is an economic case for smarter resource use. Indeed most resource efficiency projects aren't the result of public expectation but because wasting less is smart business.

Of the broad sweep of sustainability issues covered by *WME*, waste is perhaps the only one that still directly concerns every person and every business.

A lot has changed since *Waste Management & Environment Magazine* first hit desks. There's a long way to go before the 'zero waste' fairytale reaches its happy ending, but there's plenty to be proud of after 20 years of trying. WME

40 YEARS AND COUNTING

Since 1969, Veolia Environmental Services has built its reputation to become one of Australia's leading waste management and industrial services businesses.

Established as a transport business, Veolia has evolved into a dynamic and innovative Australian environmental icon, employing over 3000 staff across 100 depots nationally. Veolia Environmental Services is 100% committed to changing the face of waste management and resource recovery in Australia through innovative and sustainable solutions.

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VEOLIA
ENVIRONMENTAL SERVICES

Resetting the waste agenda

Will our 2009 National Waste Policy have the wit to see waste as symptom of inefficiency rather than a stand-alone issue? Rod Welford hopes so.

November's meeting of the Environment Protection and Heritage Ministerial Council in Perth could be a pivotal point in the history of recycling in Australia. Not since 1992 has the Federal Government taken an interest in leading policy development in this area.

The most common criticism of the 1992 National Waste Minimisation and Recycling Strategy was that it was never seriously implemented. If this latest foray, the 2009 National Waste Policy, fails to deliver significant improvements in national materials management then the time and money invested in formulating it will indeed be a waste.

In some respects, we are starting from well behind. Policy development on this front in Europe is being driven vigorously by the European Commission through extended producer responsibility, recycled product standards, directives on e-waste and reverse vending.

In Australia, the policy and regulatory framework has been marking time for the past 15 years. Apart from implementation of kerbside recycling, largely at the instigation and cost of local government, the regulatory high point in sustainable materials management nationally is the National Packaging Covenant.

What then is needed for the National Waste Policy to make a real difference, to deliver a step change in the level of resources and end-of-life products that are not wasted? How will its byline of "more resources, less waste" be manifested in practical outcomes?

The waste generation gap

In making such an assessment, it is useful to characterise the history of material resource management in Australia as falling into three generations. The language we use and how we describe the task of dealing with 'waste' may well determine what we actually do about it.

The first generation, say pre-1990s, could be characterised in much the same way all environmental problems were described at the time – preventing environmental harm by stopping the release of hazardous substances or elements into the natural environment.

This was the era of end-of-pipe responses, filtration systems and the 'management and control' of water and air pollutants. The perceived environmental and economic limits were the scarcity of accessible places to throw the wastes away, rather than scarcity of natural resources.

All about efficiency: Rod Welford

The second generation approach was captured in the 1992 national policy when the concept of a waste hierarchy took hold. The essential logic is unassailable. The concepts of 'reduce, reuse and recycle' forced their way into our thinking about waste issues, not for the purpose of using natural or virgin resources more efficiently, but to minimise or divert the residual waste disposed of into the environment.

> **"Waste should not be seen as merely an environmental issue; it is by definition an economic issue"**

It was seen as purely an environmental problem.

By 2009, some new concepts have emerged in the environmental lexicon. Concepts such as EPR, product stewardship, lifecycle management, feedback loops, eco-efficiency, cleaner production, product lifecycles, closing the loop, externalities and design for environment. This is the language of the current, third generation of thinking about these issues.

It focuses on front end solutions with a 'whole-of-life' or 'cradle-to-cradle' perspective. It focuses on the inputs of production systems and the efficiency of those systems rather than outputs and outfalls. This is what might be called the resource efficiency solution, focusing on maximising the economic efficiency with which resources are used rather than just their environmental effects.

The logic is that by maximising efficiency, the problems of waste (which, by definition, is the inefficient use of resources) are for all intents eliminated. It leaves 'waste' to truly refer to the modest residue remaining after all technically and economically feasible uses of a material resource have been exhausted. Waste is a residual issue, not the primary issue.

Policy has the wrong end

Why then do we have robust state policies for water efficiency and a National Framework for Energy Efficiency that recognise both their environmental and economic benefits, but no resource efficiency strategy for the products and materials stream? Waste should not be seen as merely an environmental issue; it is by definition an economic issue.

However, we are now serving up yet another 'waste policy' rather than a policy for the efficient use of material resources. The focus remains on the residual rather than the full lifecycle of the materials economy.

This may well turn out to be a fatal flaw to the 2009 National Waste Policy. It has not really grasped the challenge of Gen3. Although the policy calls for "more resources, less waste", its content continues to focus too much on waste (and its environmental implications) and too little on resources (and their economic potential). A new era has yet to dawn.

Rod Welford is chief executive of ACOR and before that served more than 20 years as a Queensland MP, holding various portfolios including Environment Minister. WME

10 of the best

A lot can happen in 20 years. Garth Lamb takes a look at the top 10 developments in waste over the past two decades.

1. Kerbside pride: Kerbside recycling has spread nationwide after taking hold in Sydney during the early 1990s, driven in part by media headlines about the city "running out of landfill". In 1991, NSW increased its landfill levy (to about $2/tonne) and promised to pay councils $20 for every tonne of material they recycled. John Cook, then head of Waste Services NSW, said the five-year scheme was "a major success story" that cemented kerbside recycling in Australia – tonnes recovered jumped from 99,000 in 1991 to 281,000 in 1995.

Head of the Waste Contractors and Recyclers Association, Tony Khoury, said Australia's kerbside systems today are among the most efficient in the world, and we should be "very proud of how we do it".

2. Moving targets: Federal Environment Minister Ros Kelly committed to developing a national waste strategy in 1992. A year later, a national target was announced to halve waste to landfill by 2000 and Prime Minister Paul Keating launched The National Waste Minimisation & Recycling Strategy. The states followed suit and, in 1995, NSW overhauled waste regulations and enshrined a target to cut waste to landfill by 60 per cent by 2000. Current WMAA president Ron Wainberg said diversion targets marked a turning point for the industry; there can be debate about the actual goals and the process for achieving them, but getting them in place set the wheels in motion.

3. Leveraging landfill gas: There was one 280kW landfill gas power demonstration project running at Sydney's Merrylands landfill in 1989. The first major project, a 4MW system, was installed at Lucas Heights I soon after and Cook recalls the rollout of such projects was a world-leading step. The main driver was just feeling that "it was a hell of a pity to waste the resource", because the economics were marginal with no premium for green power at the time. The first commercial project opened in 1992, a 7.7MW, $15 million facility constructed by GEC Alsthom in Sunshine, Melbourne.

Consultant Paul Howlett points out leachate controls also tightened as landfill operators reduced all pollution from sites.

4. More bins for your buck: Fearing "substantial landfill tipping fees in the future", Sydney's Manly Council in 1992 introduced weekly collection of 55L rubbish bins (previously 240L), gave all households two recycling crates, offered a green waste pick up for those without a compost heap, and charged extra for bigger waste bins. Recycle NSW head Anne Prince "wouldn't be surprised if a handful of councils implement similar programs in 1993", and the diversity of collection systems quickly gave rise to the need for waste education officers to help the community move away from the "one trashcan fits all" approach.

5. Alternatives become mainstream: AC Tipping of Girraween acquired the rights to the Bedminster waste composting technology in 1993 and, in 1998, Port Stephens Council backed Australia's first alternative waste treatment (AWT) plant, signing a 20-year contract with a 65 per cent waste diversion rate.

In 2000, Brightstar opened the $40 million Solid Waste to Energy Recycling Facility (SWERF) in Wollongong, promising to be the first plant "to recycle everything under one roof". It ended up a high profile and costly failure, but in 2002, the *WME* cover again questioned *The death of landfill?* as Waste Services NSW backed Global Renewable's ambitious UR-3R technology to divert 75 per cent of waste from landfill, creating compost or daily landfill cover, and generating energy.

The $75 million AWT opened at Eastern Creek in 2005 as Sydney's first large scale alternative to landfill. A rash of AWTs has since sprung up in Sydney and Perth, with others in the pipeline and Victoria threatening to follow.

6. Zeroing in on zero waste: The ACT was first to set itself the ultimate resource recovery aspiration, releasing its draft No Waste by 2010 strategy in 1996. Variations of the 'zero waste' theme have since been taken up by Victoria, SA and, more recently, Queensland.

7. Extended Producer Responsibility evolves: In 1992 Australia became the 20th nation to join the Basel Convention to control the cross-border movement of

hazardous wastes, an early example of a national approach to waste issues. The birth of the Environment Protection and Heritage Council two years later allowed product stewardship and European-style Extended Producer Responsibility (EPR) schemes to be pursued on a national front, although there have been few wins to date – the national oil recycling levy rolled out in 2001 being a notable exception.

RMIT director Chris Ryan launched a report in 1997 that highlighted the growing problem of e-waste and called for an EPR scheme. Six years later the NSW EPA was the first to enshrine EPR in legislation, releasing a draft statement taking the first steps toward applying its principles to key "wastes of concern", including batteries and packaging.

8. The packaging debate: In 1999, the Australian Local Government Association refused to sign the new National Packaging Covenant, saying it was not "viable" for councils and calling the process a "total loss of taxpayers' money". The voluntary agreement between the packaging industry and government has been subject to constant and fierce debate ever since, but will remain in place until at least 2010.

9. It's report time: WMAA's Wainberg said landmark reports "put a stake in the ground we can then move on from", and there's been plenty in the waste game, including Tony Wright's 2000 report calling for a "portfolio of technologies approach" to NSW waste management. In 2001, Nolan ITU and SKM Economics released a report, commissioned by EcoRecycle Victoria, quantifying the economic value of the environmental benefits of recycling at $226 million/year nationally. Hyder explored the topic again in 2008, and found recycling contributes $55 billion annually to the national economy. Not all reports were so progressive, however. In 2006 the Productivity Commission concluded waste policy should be guided "by a rigorous analysis of costs, benefits and risks" rather than unrealistic and random recycling targets – the Treasurer ultimately rejected the central thrust of the report by Philip Weickhardt (pictured).

10. Greenhouse progress: Returning from the 2009 International Solid Waste Association meeting in Europe last month, Wainberg concluded Australia is "4-5 years ahead" in terms of thinking about the linkages between waste and climate change. The 2007 Warnken-ISE report commissioned by SITA was a pivotal step, claiming Australia's waste industry could reduce national greenhouse impacts by nearly seven per cent. The carbon advantages of diverting organics from landfill and recovering embodied energy through recycling now dominate many waste discussions, and in 2008, Professor Ross Garnaut recommended the waste sector be included in Australia's emission trading scheme – which would be a world first. WME

New waste, no waste

The importance of safety and the rise of resource recovery have honed the professionalism of the waste industry we know today. By Garth Lamb.

The Waste Management Association of Australia was minted in 1990 "to encourage increased professionalism in waste management and provide a forum to develop the exchange of information". Coming just a year after *WME* first rolled off the presses, it was further recognition of the shift from "truck and dump" disposal to a more holistic *management* of waste's various impacts.

Veolia's Doug Dean, the longest reigning CEO of the Australian waste majors, said the rise of corporate governance, and especially worker safety, was the "massive driving factor for the past 20 years".

"Safety is such a major, important area, and if your record isn't good enough, then you have every chance of losing the contract, and rightly so."

Governments also funded a range of traineeships for front line workers, while the increasing complexity of waste businesses attracted skilled management, often with tertiary qualifications.

The nature of waste work has also changed to favour skills over brute strength, part of the transition away from the manual history of runners tossing trashcans into rear lift trucks.

These days, the wheelie bin takes the back strain out of moving domestic waste to the kerbside, while Australian technological innovation has seen automated side lift trucks replace runners almost everywhere. Safety has been the driver, but efficiency gains have been handy too.

There has been similar automation in waste processing. Manual picking lines are still used to remove obvious contamination from recycling streams, but technological solutions such as bounce conveyors and optical sorting machines are increasingly found in modern, multi-million dollar materials recovery facilities.

It's not just the staff and their tools changing. Another clear trend over the past two decades is industry consolidation, with a smaller number of larger, integrated service providers dominating the game.

Consultant Paul Howlett also points out the mass of small, uncontrolled disposal points have been replaced with larger, better-designed and regulated facilities.

An kerbside recycling truck in 1990, with six compartments, heralds the changes to come.

Enter the specialists

Waste management is one of the most important services local councils provide, but the increasingly sophisticated demands of the task is seeing them contract many aspects to specialist providers.

"It's very difficult to keep up with all the legislation and the practices – in the old days it was a lot easier," said Dean.

This is partly due to tighter operating margins and the complex web of regulatory requirements around safety and compliance, but also because of the growing focus on resource recovery.

> **"You have to be absolutely, completely focused on the safety of your employees"**
> – Doug Dean, Veolia

Waste services were pretty simple when all bins were emptied into one truck and dumped at the lowest possible cost, but growing community awareness of environmental issues means generators now want to "do the right thing". Many are now seeking higher order options for recyclable materials like metal, plastics and paper, while their final residuals generally end up in safe, highly engineered landfills.

Major companies with a national footprint are backing bigger, integrated waste players rather than 'one man band' operations, partly to save the hassle and cost of negotiating multiple contracts across each of their sites but also to ensure consistency in terms of achieving waste management and resource recovery goals.

"The major customers are really looking for [waste service providers] to be part of their organisation, rather than just a contractor," said Dean. "We're getting a seat at the table when they're looking at operational decisions, and that's working a lot better for everybody."

Improved IT systems in particular help waste companies provide better feedback to clients, and to enter partnership arrangements to help design, monitor and improve waste systems. There is still a long way to go in gathering high quality data and helping commercial generators manage their waste streams.

The inclusion of waste in the planned Carbon Pollution Reduction Scheme is likely to drive a step change in the sophistication of waste solutions and data management right along the waste chain, from generator feedback to recovery processes to landfill disposal. WME

Veolia Environmental Services

40 years and counting

VEOLIA ENVIRONMENTAL SERVICES

Veolia Environmental Services is an icon in Australia's waste management and environmental sector. Having forged a history spanning 40 years, Veolia, formerly Collex, has evolved from a transport company into one of the most dynamic waste management, resource recovery and industrial services entities in Australia, at the forefront of innovation and new waste technologies.

In the beginning

Veolia Environmental Services as it is known today is vastly different to the waste company that entered the Australian market in1969, through a joint venture between M Collins & Sons and Yellow Express. With these two entities then forming Collex Pty Ltd, waste operations began humbly with five Frontlift Mobile Compactors and three Linehaul Transfer Trailers.

In 1981, Mayne Nickless purchased Collex outright after having an equity share in the company for several years. A decade later, Veolia Environnement through its subsidiary, Compagnie Generale d'Entreprises Automobiles (CGEA) purchased the waste management activities of Simsmetal Limited and Mayne Nickless Limited amalgamating them as Collex Waste Management Pty Ltd. This amalgamation placed Collex among the largest waste management companies in Australia.

Collex formed part of Onyx, the waste management division of Veolia Environnement, and was able to expand operations to include:

- Collection, recovery and treatment of solid, liquid and hazardous waste on behalf of local authorities, industry and consumers;
- Commercial, urban and industrial cleaning.

Industrial services boom

With the waste business flourishing, in 1998 Collex embarked on further expansion of its national industrial services operations through the purchase of two highly respected and long established companies, Middlemass Industrial Services and Aqualine Australia. The subsequent acquisition of Vactech in 2000 positioned Collex as a major player in the national industrial services market.

More changes

In 2000, Collex Waste Management Pty Ltd reverted to the business name of Collex Pty Ltd. This change was to signify the growth of Collex as an environmental services provider, rather than a one dimensional waste services provider. This change also beckoned a new age where Collex was able to provide a broader portfolio of services in the fields of waste management and industrial services.

Veolia Environnement launches a new global brand

In 2005 Veolia Environnement embarked on a new global branding campaign which would see all global subsidiaries within the group unified under the global Veolia brand. With Onyx becoming Veolia Environmental Services, Collex would also take on this new corporate name. In October 2006, the trading name of Collex became officially defunct and operation under the name Veolia Environmental Services (Australia) commenced.

Focus on resource recovery

In 2004, Veolia Environmental Services began an ambitious project; developing the world's largest bioreactor. Utilising a disused zinc and copper mine in Tarago, near Goulburn in NSW, the Woodlawn Bioreactor beckoned a new technical age for Veolia, focused on greater resource recovery. The facility began accepting waste in 2005 from Sydney, and within 3 years was generating renewable energy.

The Woodlawn Bioreactor, in conjunction with the Ti-Tree BioEnergy facility in QLD, is testament to the investment made in determining a new age for waste management within the Australian market, whilst also adhering to the principle of turning waste into a resource.

Veolia has also diversified its resource recovery and waste management infrastructure to include advanced materials recovery facilities, food waste-to-energy plants, hazardous liquid treatment facilities, and state-of-the-art fleet and logistics solutions to support said infrastructure.


Then

Now

KEY FIGURES – VEOLIA ENVIRONMENTAL SERVICES AUSTRALIA (2008)

- Serves over 60,000 clients
- Operates in over 100 locations within Australia
- Recycled over 391 000 tonnes of waste (2008)
- Treated over 188 000 tonnes of hazardous waste (2008)
- Owns and operates two waste-to-energy facilities including the world's largest Bioreactor (NSW)
- Owns and operates Australia's first regional food waste-to-energy facility (NSW)
- Employs over 3000 staff nationally

Veolia Environmental Services today – a burgeoning leader in waste management and resource recovery.

Veolia Environmental Services today stands as one of Australia's largest and most innovative waste and resource recovery companies whilst simultaneously continuing to grow its industrial services divisions. Veolia Environmental Services now employs over 3000 staff and operates across 100 depots throughout all states.

Veolia's focus has always been on providing dynamic and sustainable environmental solutions for our customers, and 40 years on, Veolia's success, growth and diversification is attributed to these underlying business principles.

Veolia Enviromental Services

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Seeding the organic revolution

Australia dumps about 16 million tonnes of organics a year. Convert this to 15 million tonnes of CO_2 and you see why something must be done. By Mike Ritchie.

There are only two known processes for cost effectively extracting CO_2 from the atmosphere and they are both natural: photosynthesis by plants and osmosis into water. If it wasn't for the plants merrily photosynthesising away in the world's forests and algae in the oceans, we would already be experiencing the worst of climate change.

Yet the role of plants and photosynthesis in our public policy debate on climate change is almost non-existent. The farmers are right; growing trees and sequestering carbon in soil are massive opportunities to reduce atmospheric CO_2. To this end, we need an organics revolution.

In the context of waste, we need an organic waste reform program that focuses on higher and better uses for the stream than simple drive and dump. By organics I mean green and food waste in households and the commercial sector, plus timber, pallets, cardboard and paper.

Australia dumps approximately 24 million tonnes of waste per year from urban centres. Of this, about 16 million tonnes is organic, a waste stream that contributes all of the 15 million tonnes of CO_2 equivalent emissions from Australia's landfills.

While advanced landfills argue they can capture more than 90 per cent of the potential gas emissions, they are few and far between. The question we need to ask ourselves therefore is why and for how long will we continue to landfill organics, thereby creating long-term liabilities in the emission of methane, which has at least 21 times the global warming potential of CO_2?

> **"We need an organic waste reform program that focuses on higher and better uses for the stream than simple drive and dump."**

Foresight, but no action

Several state governments have looked at organic waste over the years. In 1995, then NSW Environment Minister Pam Allen proposed a ban on organics to landfill by 2000, not for climate change reasons but because organics were the single largest input stream. It never happened.

The council-run Waste Boards in Sydney helped established the Recycled Organics Unit at the University of NSW, but still organic waste specialist Eric Love noted in *WME* in 2001 that "demand in agricultural markets is not expanding at a satisfactory rate and there is an urgent need to increase understanding and practical use of products containing recycled organics among growers".

Victoria got serious in 2003 after two landmark studies on various generic waste treatment technologies and collection

strategies identified organics as the key environmental impact of waste, for the first time explicitly linking it to greenhouse gases. *WME's* report: "Organics recovery is the key to a sustainable domestic waste management system. And that means a three-bin system on the kerbside."

Industry veteran Max Spedding, then head of the SE Regional Waste Management Group, said at the time: "To further enhance landfill avoidance we are rolling out green waste collections in most areas. Once the program reaches maturity green waste will be diverted away from landfill. After this we will most likely move on to full organic waste diversions and later to new technologies."

The problem with all these pronouncements and good intent is the pace of reform since has been only slightly faster than glacial.

FACT FILE

The organics policy mix

- Establish a target for organics diversion by 2020 for municipal and commercial streams.
- Source separation drivers in the commercial and industrial sector.
- Rewards for clean stream collections of organics (via lower landfill gate fees) and on-site composting.
- Bans on vehicle loads to landfill with, say, more than 25 per cent organic content (with the exception of landfills with high gas recovery).
- Incentives to lift the gas capture rate at landfills.
- Investment in windrow and AWT composting and anaerobic digestion.
- Encouragement for home composting.
- Significant research and investment in biochar and composting.
- Measures to overcome transport cost differentials between cities and rural farms.

In fact, organics recycling in Australia is still about 36 per cent compared to a national average recycling rate of 46 per cent for all commodities and 75 per cent for paper and newsprint. Let's not forget that organics make up 60 per cent of the average household bin and are relatively easily recovered.

After a 10-year hiatus, some state governments have now started accelerating action on organics. South Australia has a comprehensive program to reduce waste to landfill and is currently trialling large-scale composting solutions.

NSW has ramped up its waste levy to drive waste out of landfill and into recovery systems, while WA has promoted alternative waste technologies (AWT) through its regional waste boards. The two states now have some of the highest concentrations of organics processing technologies anywhere in the world.

And Victoria is reviewing progress on its 2005 strategy and will hopefully fund full scale organics recycling through expanded source separated collections and AWT.

To their credit, a number of councils have also responded by introducing mixed green and organics collection services, including

Lismore and Coffs Harbour in NSW – and South Australia is taking a long hard look. We have also seen the composting of source-separated organics, composting through AWT of mixed domestic waste and the roll out of anaerobic digestion.

From waste to wealth

However, these initiatives combined have only scratched the surface. AWT facilities process less than five per cent of Australia's total household waste. Fewer than 20 per cent of households have access to an organics recycling bin and less than 17 per cent of the organics stream is recycled through the composting sector.

We cannot ignore this issue, not just because of the negative impact of landfill emissions but also the very positive benefits of sequestering carbon in soil, replenishing our degraded farmlands and storing carbon in biomass.

We now need a serious public policy debate on organic waste and a national organics strategy. The current climate change debate offers enormous opportunities to turn a waste problem into a wealth and jobs generator.

We need to take more than 10 million tonnes of organics from landfill and move it back to the farmers of Australia. We need to do this in a way that promotes sequestration and storage of the carbon in the soil to create long-term carbon sinks. We need to do this in a way that promotes enrichment and improvement of Australia's degraded soils. We just need the right vision and the will to finish the journey.

Mike Ritchie runs waste consultancy Mike Ritchie & Associates. WME