A snapshot of the major revolutions in recycling in the past 25 years

Prepared by Planet Ark for National Recycling Week 2013
RECYCLING REVOLUTION

One of the APC's key goals is to increase the recycling rate of packaging...
Foreword

Planet Ark Environmental Foundation

For most Australians, throwing an empty milk bottle or yesterday's newspaper into the recycling bin at home is something we just do, like having a shower or cleaning our teeth. We rarely have to remind ourselves to recycle or ponder whether we should do it or not – it's simply a part of our daily lives.

But this wasn't always the case. When Planet Ark was born 21 years ago, household recycling was in its infancy. Only about half of metropolitan councils offered kerbside recycling, usually monthly, and only a few items were collected, mostly newspapers, glass bottles and aluminium cans. The now ubiquitous yellow wheelie bin didn’t exist – householders instead put their recycling into small plastic crates.

Over the last 20 years, recycling has undergone nothing short of a revolution. Not only has kerbside recycling expanded dramatically, there are now widely-available schemes for the recycling of other items like batteries, printer cartridges, soft plastics, mobile phones, televisions and computers. Recycling at work has also become more prevalent.

Planet Ark is proud to have played a key role in the recycling revolution. In the early days of kerbside recycling, Planet Ark encouraged councils to time their recycling collection service with their general rubbish collection service. A few councils did this and experienced greatly increased recycling rates. Other councils followed suit, making it the norm. We also helped expand the materials collected by councils for recycling through industry partnership programs like the National Steel Can Recycling Campaign and the National Milk Carton Recycling Campaign.

Between 1994 and 2008, we ran the ‘Cards 4 Planet Ark’ campaign, which enabled people to recycle their old greetings cards at Coles Supermarkets and was instrumental in expanding paper recycling programs nationally. From 2001 to 2004, Planet Ark partnered with the Australian Mobile Technology Association (AMTA) to run the national ‘Phones 4 Planet Ark’ program for the recycling of mobile phones.

In 2003, Planet Ark launched ‘Cartridges 4 Planet Ark’ in partnership with cartridge recycler Close the Loop and cartridge manufacturers and retail outlets. This voluntary extended producer responsibility program is one of the most successful in the world and has resulted in the recycling of over 22 million printer cartridges. Planet Ark is also collaborating with ALDI on their Activ Energy Battery Recycling Program. After only a year of operation, the program has helped keep 28 tonnes of handheld batteries out of landfill and captured these valuable resources.

All of this brings us to National Recycling Week (NRW), the campaign we’re launching with this report. Since its beginnings in 1996, NRW has helped engage governments, business and ordinary Australians in recycling, and shift community perception of recycling from being a niche activity to being something we can all play a part in.

While we’re proud to have played an important role in the many recycling revolutions of the past two decades, we’re also excited about the future of recycling. One concept likely to take off in the coming years is ‘above ground mining’. The recovery of valuable resources like rare earth metals from e-waste may eventually capture more resources than traditional mining. Another likely revolution will be widespread recycling of food waste in biodigesters resulting in the generation of ‘green electricity’ from biogas, while producing valuable fertiliser to return to the land.

This report is a celebration of the achievements of governments at all levels, industry, and organisations like Planet Ark in making recycling second nature, as well as the willingness of Australians to embrace recycling, thereby helping to make our society more sustainable. I hope you enjoy reading the report and reflecting on the many recycling revolutions that have taken place in Australia and your role in making them happen.

Paul Klymenko
CEO
Planet Ark Environmental Foundation
INTRODUCTION

Few people would argue that recycling is a good thing for the environment, society and the economy. Recycling saves natural resources like rare metals, oil and water that are required to make new items from scratch. It also saves energy, reduces greenhouse gases entering the atmosphere, and decreases waste sent to landfill.

78% of Australians find recycling at home easy and convenient.

In the past 25 years, recycling in Australia has undergone a revolution, from the introduction of council-operated kerbside recycling services in the late 1980s and early 1990s, to more recent initiatives, such as the National Television and Computer Recycling Scheme, from 2012. For most Australians, recycling at home, at work and when out and about, is now more accessible than ever, and the range of materials we can recycle is growing all the time. Once a niche activity for the most environmentally committed, recycling, at least on the home front, is now second nature for most of us. Indeed, research conducted by Pollinate for this report found that 85 percent of Australians agree that recycling at home is the right thing to do, while 78 percent of people think that recycling at home is easy and convenient.

Produced for Planet Ark’s National Recycling Week 2013, this Recycling Revolution report provides a snapshot of the progress in recycling in Australia since the late 1980s. It is also a call to action for individuals and businesses to be part of the many recycling revolutions that are well underway, and those just beginning. This is important because while many Australians are well aware of established initiatives like kerbside recycling, ‘Cartridges 4 Planet Ark’ and MobileMuster, more recently introduced services, like TechCollect for televisions and computers and ALDI’s battery recycling program, are less well known. Even with established initiatives, there’s still a need to increase understanding so we can make best use of the available services. For example, many Australians are still confused about what they can recycle at home. This report aims to help clear up some of this confusion, but more importantly, it strives to encourage Australians to make use of the many recycling services now available to them and to recycle everything they possibly can.

About this Report

This report comprises separate sections that provide an overview of the recycling revolutions that have taken place in Australia in the following areas:

- Electronic or E-waste
- Household Packaging
- Flexible or Soft Plastics
- Batteries
- Workplace Recycling
- Mobile Phones and Printer Cartridges, and
- Household Food Waste.

Each section describes the particular material, explains the environmental and other issues associated with that material, outlines the recycling revolution that has occurred for that material and, finally, provides practical information on how people can “join the revolution”.

The report draws on information and statistics from a wide range of internal and external reports, and includes the results of recent independent research commissioned by Planet Ark and conducted by Pollinate for this project. One thousand Australians aged 14-64 years of age were surveyed online from 4–10 September 2013, as part of Pollinate’s ongoing Green Pulse omnibus. The sample was representative of the Australian population in terms of age, gender and location.

Planet Ark Environmental Foundation

Planet Ark is an Australian not for profit environmental organisation, founded in 1992. We work in partnership with the public, businesses, governments, councils, schools, community groups and other not for profit organisations to help create positive environmental actions for everyone.

Held in November each year, National Recycling Week provides an annual opportunity for Planet Ark and its sponsors to engage individuals, workplaces, councils and schools in simple and positive actions that encourage recycling in its many forms. In 2013, National Recycling Week will run from 11–17 November.

Acknowledgements

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What is E-waste?

E-waste is any used electronic equipment that requires electric currents or electromagnetic fields in order to function and has reached the end of its useful life. It includes:

- Consumer/entertainment electronics, such as televisions, DVD players and amplifiers
- Office, information and communications technology, such as computers, telephones and mobile phones, printers and photocopiers
- Household appliances like fridges, washing machines and microwaves
- Lighting devices like desk lamps
- Power tools, such as power drills
- Sport and leisure equipment, such as fitness machines and remote control cars.

The Problem with E-waste

Australians are among the most rapid adopters of new technology in the world. This means that e-waste is growing three times faster than any other type of waste in Australia\(^1\). In 2011-12, an estimated 29 million televisions and computers across Australia reached their end-of-life, with only around 10 per cent of these likely to have been recycled\(^2\). By 2027-28, this figure is expected to rise to 44 million units, or 181,000 tonnes\(^3\). This is equivalent to more than 650 Airbus A380 airplanes! The disposal of cathode ray tube (CRT) televisions is a particular issue with the progressive closure of the analogue signal across Australia.

The inappropriate disposal of unwanted televisions, computers and other e-waste is a problem not only for the environment but also for human health. Electronic equipment contains hazardous materials, such as lead and mercury, which can leach into soil and water if they are landfilled or dumped\(^4\). Large electrical items like televisions and computers also take up considerable landfill space. If improperly burnt in incinerators, some components in e-waste, such as halogenated plastics, can emit toxic substances like dioxins and furans into the air\(^5\). Televisions and computers also contain valuable non-renewable resources like gold, steel, copper, zinc and aluminium\(^6\). When e-waste is sent to landfill or recycled incorrectly, these resources are wasted, along with the water, oil and energy required to produce electrical equipment.

E-waste is a serious environmental and ethical problem in a number of developing countries. In the late 1980s and 1990s, tighter environmental regulations were introduced in industrialised countries, which saw the costs of waste disposal skyrocket\(^7\). “Toxic traders”, unscrupulous businesses offering to take waste away for recycling, began shipping hazardous wastes like e-waste to Africa, Eastern Europe and other regions\(^8\). Once on shore, these waste shipments were dumped indiscriminately, spilled accidentally or recycled improperly, causing severe health problems for workers and residents, and contaminating the land, water and air\(^9\).

In 2011-12, an estimated 29 million televisions and computers across Australia reached their end-of-life.
The E-waste Recycling Revolution

A whopping 95-98 per cent of the materials in computers and televisions, including plastics, metals and glass, can be fully recycled for future use\(^ {14} \). More gold can be recovered from one tonne of computer e-waste than can be recovered from 17 tonnes of gold ore\(^ {15} \). With the constant development of new technology, and resources like rare earth metals getting harder to find and more expensive to extract from the ground, ‘above ground mining’, or the recovery of resources from e-waste, will become increasingly important.

2012 marked a major revolution in the recycling of e-waste in Australia, with the first services established under the Australian Government’s National Television and Computer Recycling Scheme, a national, industry-funded recycling scheme for these items. Prior to the introduction of the Scheme, customers or councils covered most of the cost of recycling electrical equipment, and very little equipment was recycled. Now, manufacturers that make and/or import televisions and computers must support the recycling of these products at the end of their life. Importers and manufacturers are required to join and fund industry-run arrangements, such as the not for profit organisation TechCollect, which has established recycling drop off points around Australia. Dropping off unwanted televisions and computers for recycling is free of charge for households and small businesses.

To help combat the e-waste export problem, the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal came into force in 1992, under the auspices of the United Nations Environment Program\(^ {10} \). This Convention puts an onus on exporting countries to ensure that hazardous wastes are managed in an environmentally sound manner in the country of import. Australia signed the Basel Convention in 1992 and Australia’s obligations under the Convention are implemented in the Hazardous Waste (Regulation of Exports and Imports) Act 1989\(^ {11} \).

Despite the Basel Convention and the introduction of hazardous waste legislation in many countries, the movement of e-waste from developed to developing countries continues to be a problem. Reports to the Basel Convention suggest there are at least 8.5 million tonnes of hazardous waste moving from country to country for disposal each year\(^ {12} \). While much of this is received as a welcome source of business, many countries complain they are receiving shipments that they never agreed to and are unable to deal with properly\(^ {13} \).
Join the Revolution!

Join the e-waste revolution and recycle your old televisions, computers and computer accessories using the free National Television and Computer Recycling Scheme industry arrangements, such as TechCollect. Visit Planet Ark’s RecyclingNearYou website to find a local drop off site.

If the Scheme is not yet available in your area, there are a few things you can do:

- Store your items in a dry place until a collection point becomes available
- Find out if your local council provides a recycling service
- Contact the manufacturer to see if they offer a recycling program
- Give your items away using a service like Freecycle
- Ask local second-hand shops or charities if they could use the items.

You could also hold off getting a new television for as long as possible. Instead of buying a new digital television, get a set top box, which will enable you to keep your old analogue television. This is a less expensive and far more environmentally friendly option.

If your workplace has televisions and computers to dispose of, visit Planet Ark’s BusinessRecycling website to find a local drop off or collection service.

As of October 2013, there were 425 drop off points across Australia for end-of-life televisions and computers.

The Scheme is gradually being rolled out across the country, with over 400 sites already established. By the end of 2013, these industry-funded recycling services will be provided across metropolitan, regional and rural areas. To provide flexibility to suit local circumstances, these services may include ongoing drop off points, collection events or mail-back options.

The Australian Government sets recycling targets and parameters for the industry arrangements for providing these recycling services. In 2012-13, the industry was required to collect and recycle 30 per cent of discarded televisions and computers. Preliminary reports from the Department of Environment show that around 40,000 tonnes of televisions, computers and computer products were recycled under the Scheme in 2012-13. This is nearly double the recycling volume prior to the introduction of the Scheme.

To ensure the e-waste collected is recycled in a safe and environmentally appropriate way, a standard for the collection, storage, transport, processing, handling and re-use of e-waste is currently being developed. In the meantime, an interim standard is in place for televisions and computers.

The Pollinate research conducted for this report found that 12 per cent of Australians currently know about the TechCollect and Drop Zone television and computer recycling collection points and only 5 per cent of people are aware that the National Television and Computer Recycling Scheme is funded by manufacturers and importers. As public awareness levels rise, so too will the number of televisions and computers recycled through the Scheme.

40,000 tonnes of televisions, computers and computer products were recycled under the National Television and Computer Recycling Scheme in 2012-13.
HOUSEHOLD PACKAGING WASTE

What is Household Packaging?

Household packaging has become an integral part of modern life. Packaging contains, preserves and protects consumer goods, making their handling, warehousing and distribution easier and cheaper, and ensuring consumers receive a clean and safe product. It also extends the shelf life of products and helps reduce food waste.

While packaging has been around for centuries in one form or another, its use, and the variety of packaging available, has skyrocketed since the mid 20th century. Once fairly limited, packaging options now include a vast range of rigid, semi-rigid and flexible options that use less material, are generally lightweight, and are easy to use, store and dispose of.

Household packaging consists of a wide range of materials, including:

- Cardboard and paper-based packaging, such as boxes
- Glass jars and bottles
- Hard plastic packaging, such as milk and juice bottles, butter tubs and ice cream containers
- Semi-rigid packaging like polystyrene foam
- Flexible and soft plastic packaging, such as plastic bags and wrap, pouches, tubes and biscuit trays
- Liquidpaperboard milk and juice cartons
- Aluminium cans, aerosol cans and foil
- Steel cans, drums and aerosol containers.

In 2012, Australians sent about 1.6 million tonnes of packaging to landfill.

The Problem with Household Packaging Waste

While packaging has many benefits, it also has some environmental impacts. Australia’s increasing population and economic growth in recent years has seen the consumption of goods, and hence the use of packaging, rise. This has led to an increase in household waste and in the amount of waste sent to landfill. In 2012, Australians consumed approximately 4.4 million tonnes of packaging and sent about 1.6 million tonnes, or 36 per cent, to landfill.

Packaging production requires significant resources, including energy, water and oil, although the packaging industry has started moving towards source reduction, or lightweighting, which has gone some way to reducing this demand. Packaging is also one of the main components in litter.

The Household Packaging Waste Revolution

The introduction of kerbside recycling services in Australia in the late 1980s and early 1990s was a major turning point in the effective management of household packaging waste. Since the early days, this revolution has grown so that about 95 per cent of Australians can now recycle their used packaging at home.

In the 1990s, recycling collections in Australia shifted from being industry-run programs targeting high value items, such as glass and aluminium, to council-provided services paid for by residents. Today, local...
Between 2003 and 2012, the recycling rate for packaging increased from 39.2 per cent to 63.8 per cent.

Between 2003 and 2012, there was a dramatic increase in the amount of packaging recycled:

- Tonnages grew from 1.64 million tones to 2.81 million, and
- The used packaging recycling rate increased from 39.2 per cent to 63.8 per cent.

Paper and cardboard combined was the most recycled packaging material in 2012, with a recycling rate of 76.8 per cent. Aluminium cans came in second with 67.3 per cent, followed by plastics, which had a collective recycling rate of 41.5 per cent. The APC is focused on achieving an overall recycling rate of 70 per cent for all packaging materials by 2015.

Once collected from the kerbside, recycling is taken to a Materials Recovery Facility (MRF) for sorting. The sorted materials are then reprocessed by specialist recyclers and used to produce new items. Recycling waste packaging, rather than using raw materials to make new packaging, saves significant amounts of energy and natural resources, and reduces pollution. For example, recycling an aluminium can uses 95 per cent less energy than it takes to make a new can from raw materials, with every can recycled saving enough electricity to run a television for three hours.

Recycling one aluminium can saves enough electricity to run a television for three hours.

Recycling at home is now second nature for most Australians, and access to away-from-home recycling services is growing all the time (see insert on p.10). However, while the research conducted by Pollinate for this report found that 85 per cent of Australians agree that recycling at home is the right thing to do and 78 per cent agree that recycling at home is easy and convenient, the survey results also show that many people are still confused about the recyclability of certain items:

- More than 1 in 2 Australians (55 per cent) incorrectly believe they can put old or broken drinking glasses in their recycling bin
- More than 1 in 2 people (52 per cent) incorrectly believe that biscuit packets and trays can be recycled at home
Recycling away from home

In recent years, consumer demand and government recycling targets have led to the development of away-from-home recycling services in an ever-growing number of public places. These include parks, shopping centres, fast food outlets, airports, sporting and entertainment venues and tourist resorts. The Pollinate research conducted for this report found that 68 per cent of Australians feel frustrated when they have to put recyclable items in a rubbish bin when they’re away from home\textsuperscript{28}. When asked how they disposed of the last aluminium can or plastic drink bottle they used outside their home, 30 per cent of people said they put it in a rubbish bin, 31 per cent said they took it home to recycle it, and 35 per cent said they recycled it in a public place recycling bin\textsuperscript{29}.

The Australian Packaging Covenant has provided funding for numerous away-from-home recycling projects. One of these involved the installation of new APC-funded recycling bins at 36 Westfield Shopping Centres in the ACT, NSW, QLD, SA, VIC and WA during 2009-10. This initiative nearly trebled the number of bottles and cans recycled and diverted 1,492 tonnes (up from 542 tonnes) away from landfill in 2011\textsuperscript{30}. The APC also provided funding for the installation of a public recycling system for the Crown Entertainment Complex in Melbourne. This project provided commingle recycling to 90 per cent of all public areas and is expected to result in between 285 and 500 tonnes of recyclable material being diverted from landfill every year\textsuperscript{31}.

• Over a quarter of Australians (28 per cent) incorrectly believe they can put plastic bags in their recycling bin
• One fifth of Australians (20 per cent) incorrectly believe that old or broken ceramic items can be recycled at home.

This level of public confusion about what can and cannot be recycled at home means that contamination of recycling with non-recyclable items is a major issue. Contamination can make it harder to sort and recover desired materials, limit the uses for recovered materials, and cause problems with the machinery in processing facilities. For example, a broken ceramic mug or just five grams of ovenproof glass can stop a whole tonne of otherwise recyclable glass being used to make new bottles\textsuperscript{27}. Often, items like batteries, nappies and polystyrene foam also wrongly end up in recycling bins.

Join the Revolution!

To find out how you can “recycle right” and reduce contamination in your at-home recycling, visit RecyclingNearYou and search in your suburb or council area. Click on “Kerbside Recycling collection” to see a list of the materials that can and cannot be recycled in your area. Remember, if in doubt, leave it out!

To find out what happens to your recycling after it’s collected from your home, check out the “Sorting Your Recycling” video produced by Planet Ark.
What are Soft Plastics?

Soft or flexible plastics are any plastics that can be easily scrunched into a ball or easily broken when crushed by hand. They include:

- Bread, cereal, frozen food, rice and pasta bags
- Biscuit packets and trays
- Confectionery packets
- Shrink wrap around multi-packs of cans and on newspapers
- Plastic shopping bags, including lightweight ‘singlet’ bags made from high-density polyethylene (HDPE) and sturdier ‘boutique’ bags made from low-density polyethylene (LDPE).
- Reusable ‘green’ bags.

The Problem with Soft Plastics

While fewer resources are required to produce and transport soft plastics than many other forms of packaging, they still have a significant impact on the environment. Around 300,000 tonnes of flexible plastic packaging is disposed of in Australia each year, with one third coming from households\(^2\). Single-use plastic bags are the highest profile of these, but most homes are packed with a wide range of soft plastics, especially in kitchens. While plastic bag use has declined since 2002, thanks to the introduction of a voluntary retailer program and compulsory bans in some states, Australians still use a whopping 3.9 billion HDPE plastic bags each year\(^3\). About 3.3 billion of these bags end up in landfill, 610 million (15 per cent) are recycled, and about 40 million make their way into our parks, streets and waterways as litter\(^4\).

South Australia (SA), the Northern Territory and the Australian Capital Territory have all banned the supply of single-use HDPE plastic bags in retail outlets, with Tasmania to follow suit from November 2013\(^5\).
Around 300,000 tonnes of flexible plastic packaging is disposed of in Australia each year.

SA government estimates there are almost 400 million less plastic bags in the State every year as a result of the ban. Many towns around the country have also instigated voluntary bans with Fremantle being the first council to officially ban retailers from issuing single-use, non-biodegradable bags.

Littered plastic bags cause serious damage to wildlife, livestock and natural habitats. Some littered bags end up in the oceans, where marine life like turtles, whales, birds and fish can get tangled in them or mistake them for food. Once ingested, a bag can prevent animals from digesting food or from submerging. Plastic bags also clog drains and waterways, increasing the threat of flooding in natural and urban environments. Littered plastic bags also create visual pollution and can take up to an estimated 1,000 years to break down.

Plastic bags are one of the most obvious displays of our throwaway society. Their production requires non-renewable resources, such as petroleum, gas and coal, and most plastic bags are used for just minutes before being discarded. The petroleum used to make the 3.9 billion plastic bags that Australians use each year could power a car around the Earth’s Equator 112,000 times. This is a huge waste of resources.

Soft plastics, particularly plastic bags, are one of the main contaminants found in household recycling bins. Plastic bags interfere with the sorting process and machinery found in most recycling facilities. Worryingly, the Pollinate research conducted for this report found that over one in four (28 per cent) of Australians incorrectly believe that plastic bags can go into household recycling bins. More than one in two people (52 per cent) wrongly believe that biscuit packets and trays can also go in.

Biodegradable and degradable bags are new technologies that do not currently address the key problems with plastic bags:

- These bags are still single-use, representing a waste of resources
- They are easily littered and can still have an impact on wildlife
- When biodegradable bags break down in landfill, they create the greenhouse gas methane
- The impact of oxo-degradables on the environment after they break down into microscopic pieces is still unknown.

The Soft Plastics Recycling Revolution

Late 2012 saw a revolution in soft plastics recycling with the introduction of the REDcycle Program. While most supermarkets have been collecting single-use HDPE plastic bags for recycling for a number of years, the REDcycle Program allows consumers to recycle a wider range of soft plastics by returning them to more than 480 drop-off points at Coles supermarkets in all major cities and a number of regional centres across Australia. The plastic packaging is processed in...
Many other supermarkets have recycling bins for single-use plastic shopping bags. Visit RecyclingNearYou to find a location in your area. Torn or damaged reusable “green bags” can also be placed in these collection bins. Biodegradable plastic bags cannot be recycled in these systems. Biodegradable bags that meet the Australian Standard (AS 4736-2006) can be placed in your compost but all other biodegradable bags should be disposed of in your household rubbish.

Of course, the best environmental option is to reduce your use of plastic bags. Get in the habit of taking long-life reusable bags when you go shopping. If you’re caught out and need to accept single-use bags, use as few as possible. If each Australian family used just one less plastic bag per week, there would be 253 million less bags used per year.

Between December 2012 and June 2013, 20.5 million units or 82 tonnes of soft plastic was recycled through the REDcycle program. This equates to more than 1 million items per week. Plastic bags make up 61 per cent of the plastic recovered through the program, food and grocery packaging make up 32 per cent, and “green” bags and miscellaneous contamination comprise around 7 per cent.

If each Australian family used one less plastic bag per week, there would be 253 million less bags used per year.

**Join the Recycling Revolution!**

Collect your soft plastics for recycling and take them to the REDcycle collection bin at participating Coles stores. Get in the habit of putting them straight into a reusable shopping bag, and visit the REDcycle website to find your closest collection bin. If there isn’t a participating Coles store near you, you can post your soft plastic to:

- RED Group
  Attn: Plastic packaging recycling
  80 Maffra Street
  Coolaroo VIC 3048

Using reusable bags when shopping is the best way to help reduce the environmental impacts of plastic bags.
The Problem with Battery Waste

Batteries are the most common form of household hazardous waste. Australians use about 345 million handheld batteries (those weighing less than 1 kilogram) each year. Around 264 million of these batteries (weighing a total of 12,000 tonnes) reach the end of their life annually. While 80 per cent of Australians think that end-of-life batteries should be recycled, it is estimated that only 4 per cent of handheld batteries (by count) are recycled every year.

Most end-of-life handheld batteries (approximately 70 per cent by count) end up in landfill, while a smaller proportion (26 per cent by count) is ‘informally stockpiled’ inside products like old mobile phones or accumulated in homes, garages and offices.

Only 4 per cent of handheld batteries by count are recycled every year.

In contrast, larger automotive batteries are much more commonly recycled. Of the 6 million automotive batteries used by Australians each year, around 82 per cent are recycled responsibly, with most of the remainder informally stockpiled, ‘rebrithed’ (inappropriately rebranded for resale), or illegally exported. About 2 per cent of automotive batteries go to landfill. In total, around 11,000 tonnes of handheld, automotive and industrial batteries are estimated to end up in landfill every year.

Batteries contain metals, such as lead, cadmium, mercury, lithium, manganese, nickel and zinc. Lead,
mercury and cadmium are particularly toxic to human health and the environment\(^5\), while lithium batteries are highly flammable if exposed to moisture once the cells corrode\(^6\). As batteries start to break down in landfill, the heavy metals they contain can leach into surface and groundwater, polluting soil and water, and harming humans and wildlife\(^1\). This is a concern because 15 per cent of large landfills and 65 per cent of medium sized landfills in Australia are not lined\(^2\).

While over 90 per cent of the materials in most batteries can be recycled\(^3\), the irresponsible disposal of large numbers of batteries means a significant proportion of the valuable, non-renewable materials used in batteries are wasted. Recycling batteries not only recovers these resources, it also prevents the potentially hazardous substances in them from contaminating the environment. In addition, recycling the materials in end-of-life batteries into new batteries and other products reduces the environmental impacts of the mining and manufacturing required to make these products.

If placed in household waste, a battery can leach chemicals and contaminate the other contents of the bin. Batteries are particularly problematic for alternative waste treatment facilities that produce organic products like soil conditioners and mulch from mixed household waste. Batteries can get damaged during the processing of waste in these facilities and release hazardous materials, making it difficult for operators to meet stringent quality requirements for their end products\(^4\).

**The Battery Recycling Revolution**

The biggest revolution in battery recycling in Australia has been the development of widespread and free battery collection schemes. In the absence of government legislation forcing manufacturers to take responsibility for the items they produce, some retailers have taken the lead.

In October 2012, the battery recycling revolution took a big leap forward with the launch of the **ALDI Activ Energy Battery Recycling Program**, which accepts all types of AA, AAA, C, D and 9V sized batteries for recycling. In the first 12 months of the program, 28 tonnes of household batteries were collected for recycling. Planet Ark supports this exciting initiative.
End-of-life handheld batteries weighing less than 2 kilograms were recently added to the Australian Government’s priority list of products for the Product Stewardship Act 2011. This means they are being considered for coverage under the Act and may be regulated in the future through a voluntary, co-regulatory or mandatory product stewardship scheme.

Join the Revolution!

Collect and recycle your household batteries in the special bin at your local ALDI store (for AA, AAA, C, D and 9V sized batteries) or Battery World outlet (for all household and automotive batteries). Old automotive batteries can be also recycled at your nearest Century Yuasa Battery Recycling Centre.

If you don’t have an ALDI, Battery World or Century Yuasa Battery Recycling Centre nearby, visit RecyclingNearYou to find your closest battery recycling option. If you’re a business, visit BusinessRecycling to find a local commercial recycling service.

Before recycling batteries, remove all packaging and make sure they are completely discharged. If you think there may be charge remaining, cover the poles of the battery with a piece of sticky tape.

Significantly reduce your battery waste by using rechargeable batteries. Each battery can be recharged up to 1000 times, saving money and reducing pollution from discarded batteries. According to one study, the environmental impact of rechargeable batteries is up to 32 times less than that of disposable batteries, throughout their life cycle.

Battery World also provides a Community Recycling Program for domestic and commercial batteries in their stores.

In 2008, Century Yuasa Batteries introduced a used lead acid battery recycling program. The program enables customers and groups to return lead acid batteries to over 900 Century Yuasa Battery Recycling Centres across Australia. Each year, it collects and recycles more than 200,000 car batteries to very high environmental standards. Planet Ark acknowledges Century Yuasa’s commitment to the environment, not only through its battery recycling program, but also through its continuing associate sponsorship of National Recycling Week.

Batteries collected through the various schemes are sorted by type and transported to approved recyclers in Australia and overseas, which extract relevant materials for re-use. Currently, only lead acid and industrial nickel cadmium batteries are recycled in Australia. Local reprocessing of alkaline and lithium batteries is likely to become more viable as collection volumes increase.

One of the leaders of the battery recycling revolution is the Australian Battery Recycling Initiative (ABRI). ABRI was launched in 2008 by a group of battery manufacturers, consumer electronics suppliers, recyclers, government bodies and environment groups to promote the collection, recycling and safe disposal of the full range of batteries.

The environmental impact of rechargeable batteries over their life cycle is up to 32 times less than that of disposable batteries.
What is Workplace Waste?

Workplace or commercial and industrial waste (C&I) is generally solid waste generated by businesses and institutions, including state and federal government entities, schools and tertiary institutions. The industries that make up this stream are diverse and include manufacturing, accommodation and food services, retail and transport, as well as primarily office-based industries. C&I waste does not include waste from the construction and demolition (C&D) sector. C&D waste is a different stream and is accounted for separately.

The waste generated by the C&I sector is equally diverse. It includes:

- Metals, glass and plastics, including flexible packaging
- Food waste, garden waste and timber
- Paper and cardboard
- Electronic and office equipment, such as computers and printer cartridges
- Leather and textiles
- Tyres and other rubber products
- Hazardous waste, such as asbestos, contaminated soil and clinical waste
- Masonry materials (not generated by the C&D sector), including bricks, concrete and plasterboard.

The Problem with Workplace Waste

The C&I stream is the second largest contributor to waste generated in Australia (after the C&D stream). About 12.5 million tonnes of C&I waste is produced each year, which is almost a third of the total waste generated in Australia. This equates to about 1.7 tonnes per employee per year. The amount of C&I waste generated in Australia between 2002-03 and 2006-07 increased by 52 per cent. If this trend continues, by 2020, Australia will generate 33.2 million tonnes of C&I waste annually.

A 2012 Australian study reported that:

- Around 6.8 million tonnes of C&I waste is sent to landfill each year
- The sectors producing the most waste are: Manufacturing; Accommodation and Food Services (Food and Beverage Services); and Retail (excl. food)
- Small and medium businesses account for a significant portion of the C&I waste sent to landfill
- At 36 per cent, food waste, garden waste, timber and other biodegradable waste make up the biggest component of C&I waste sent to landfill
- Cardboard, office paper and other paper, although readily recyclable, is the second biggest component of C&I waste going to landfill, making up 22 per cent
- Other readily recyclable materials sent to landfill include masonry and plastic packaging.

Food waste is particularly problematic for the C&I sector because it often contaminates paper, cardboard and plastic waste, making it difficult to recycle these materials. In addition, when decomposing in landfill, food, paper and cardboard produce methane, which has a global warming potential 25 times that of carbon dioxide over a 100-year time horizon.
Australian businesses spend more than A$2.2 billion each year on waste services, of which A$1.4 billion is spent on sending waste to landfill. The C&I stream as a whole spends around A$26.5 million on material inputs that are subsequently disposed of as waste.

**The Workplace Recycling Revolution**

Between 2002–03 and 2006–07, the recycling of C&I waste increased by 92 per cent. Today, more than 5.7 million tonnes of C&I waste is recovered annually and the estimated recycling rate stands at about 46 per cent across the country. The key materials currently recovered include paper/cardboard, metals, glass, and to a lesser extent, timber and plastics. Recycling rates across different industries range from 9 per cent for the rental, hiring and real estate services sector to 86 per cent for the transport, postal and warehousing sector.

Once household recycling became a mainstream activity in the 1990s, the community looked to the commercial sector to follow suit. The growth of corporate social responsibility in the past decade has seen many businesses implement waste minimisation and resource recovery programs to reduce the risk of environmental harm and improve their reputation and profile. Increasingly, employees have been placing pressure on employers to provide recycling facilities at work. Australia-wide, 80 per cent of employees would like to see more recycling in their workplace. In the research conducted by Pollinate for this report, 71 per cent of people said that having access to recycling facilities at work makes them feel like they work for a responsible employer.

Community resistance to new landfill developments has also helped spur on the development of government policies that encourage waste reduction and recycling in the sector. Many states now have landfill levies in place, which makes waste disposal more expensive and waste avoidance and recycling more attractive. Other regulatory changes, such as state-specific bans on materials like e-waste going to landfill, the introduction of product stewardship schemes, and initiatives like the Australian Packaging Covenant and government waste targets, also play a role.

There are now many resources available to help businesses manage their waste and reduce the associated business and environment costs. Planet Ark's BusinessRecycling.com.au is designed to make it easy for Australian businesses to find local recycling services. Extended producer responsibility programs like ‘Cartridges for Planet Ark’ and MobileMuster also help businesses recycle common workplace materials like printer cartridges and mobile phones.

**Join the Revolution!**

Become a recycling champion in your workplace! Find out how to set up a new recycling system at work, or promote an existing one, by visiting BusinessRecycling. You’ll be able to download a step-by-step toolkit to help you get started.

To find recycling collection and support services for your workplace, search BusinessRecycling. It contains 6,676 listings of re-use, recycling, collection and drop-off locations and services across the country for more than 90 different materials.
Closing the loop on office paper

Recycling office paper creates meaningful environmental savings. Every tonne of office paper recycled saves enough energy to power 1.5 houses for a month and enough water to fill two bathtubs. It also avoids 17 wheelie bins worth of waste and the same amount of carbon dioxide produced by driving a car 3,243 kilometres80.

While recycling used office paper is very important, it is equally important to “close the loop” by purchasing recycled paper products. Today, good quality office and printing paper is available with recycled paper content of up to 100 per cent, and soon, businesses will be able to buy Australian-made 100 per cent recycled paper thanks to a new recycling initiative by Australian Paper. The company is building a A$90 million paper recycling plant at Maryvale in Victoria that will be the country’s only premium paper recycling plant capable of making high quality recycled office and printing papers. From mid-2014, the plant will divert up to 80,000 tonnes of waste paper from landfill every year81, which is equivalent to 16 billion sheets of A4 paper, enough to pile a tennis court 1 kilometre high.

Planet Ark has teamed up with Australian Paper in the Make It Recycled partnership. This partnership aims to reduce the amount of paper going to landfill and encourage government, businesses and households to use locally-made, high recycled-content paper. Visit the Planet Ark website to find out more.

Recycling from the ground up

Even ubiquitous but largely unseen materials like carpet underlay can be recycled. Dunlop Flooring developed its own underlay recycling program, Recycle by Dunlop. Participating retailers collect old or discarded foam underlay, together with off-cuts and trims sent back to them, and deliver all of this to Dunlop Flooring. Here it is cleaned, sorted, and ultimately recycled into new reusable underlay. This brand new recycled Dunlop underlay is then passed on to the retailer, who in turn sells it to homeowners for installation under their carpet.

As Australia’s largest recycler of polyurethane foam, Dunlop Flooring processes in excess of 10,000 tonnes of foam per year, foam that would normally be sent to landfill. This is enough to fill the MCG! It is estimated that over the past five years, the program has saved 16,848 tonnes of carbon dioxide (equivalent to the emissions from 42,924 vehicles) from entering the atmosphere82. In recognition of these achievements, Recycle by Dunlop won the Waste Minimisation Award in the 2013 Banksia Sustainability Awards.

Dunlop underlays are made of 90% recycled materials and are 100% recyclable. Flooring Xtra stores actively support the Recycle by Dunlop program and green initiatives like Planet Ark’s National Recycling Week. For more information, visit National Recycling Week.
MOBILE PHONES AND PRINTER CARTRIDGES

What are Mobile Phones and Printer Cartridges?

**Mobile phones** have transformed our lives. There are now over 6.8 billion mobile phone subscriptions worldwide, up from fewer than 1 billion in 2000. Sales of smartphones have boomed in recent years. In Australia, an estimated 84 per cent of mobile subscribers now own a smartphone, up from 19 per cent in 2007. Mobile phones consist of a wide range of metals, as well as plastics, glass and hazardous substances like brominated flame retardants.

**Printer cartridges** are made of plastics, metals, foam, paper, nylon, rubber, ink and toner. The most common types used in homes and businesses are toner cartridges (used in laser printers) and ink cartridges (used in inkjet printers).

The Problem with Mobile Phone and Printer Cartridge Waste

Both mobile phones and printer cartridges have environmental and ethical impacts and their production requires significant resources, including oil, water and energy. Producing just one toner cartridge, for example, requires about 3.8 litres of crude oil. This production also results in pollution and waste, and the emission of greenhouse gases.

Australia has 30 million mobile phone subscribers and most Australians upgrade their handset every 18 to 24 months. There is estimated to be more than 23 million old and unwanted mobile phones in homes and offices around Australia, representing a huge waste of resources. The manufacture of mobile phones requires non-renewable resources, such as crude oil, copper, aluminium, lead, gold, coltan and zinc. Mobile phones also include small amounts of toxic metals and chemicals, like cadmium, chromium and brominated flame retardants, although there are now phones on the market in Europe and elsewhere that do not contain these substances.

While mobile phones present no environmental or human health hazard in ordinary use, hazardous substances may be released into the environment when phones are not handled properly at the end of their life. For example, the shredding of phones can release dusts and fumes containing beryllium and other toxic materials, the burning of plastics in certain incinerators can release carcinogenic dioxins and furans, and the disposal of phones in landfills that aren’t lined can result in the leaching of hazardous substances into soil and groundwater. The batteries in mobile phones can also release toxic substances if they are not removed from the phone prior to end-of-life processing.

There is estimated to be more than 23 million old and unwanted mobiles in homes and offices around Australia.
**Printer cartridges** can also have major environmental impacts. Australians throw away millions of printer cartridges every year and each cartridge takes up to 450 to 1000 years to decompose. Printer cartridges contain toxic ingredients and volatile organic compounds (VOCs) in the form of solvents. When cartridges break apart in landfill, these toxic components have the potential to contaminate groundwater and the environment.

Independent research conducted for Planet Ark by Pollinate in 2010 found that 33 per cent of Australians throw their used printer cartridges in the general waste bin and a further 14 per cent incorrectly put them in their council-provided recycling bin, adding to the problem of contamination in recycling.

In addition to environmental impacts, there are also ethical issues associated with the production and disposal of mobiles and cartridges. For example, some mobile phone buyback schemes purchase old mobile phones in developed countries and send them to developing countries for reuse or refurbishment, where they may be unsafely recycled or end up in landfill. Old printer cartridges can also end up in third world countries where the cartridges are dismantled, the toner is removed and the rest of the cartridge is discarded or burned. Primitive recycling techniques in developing countries can expose adult and child workers to hazardous substances, and these workers are often poorly paid.

### The Mobile Phone and Printer Cartridge Recycling Revolutions

The responsible recycling of mobile phones and printer cartridges has significant environmental benefits. Over 90 per cent of the materials used in mobiles and accessories can be recovered. Recycling just 50,000 handsets can save 110 tonnes of gold ore, 213 tonnes of silver bearing ore and 11 tonnes of copper sulphide ore from being mined. For every tonne of mobile phone materials recovered, 10 tonnes of greenhouse gas emissions are avoided. Many of the components in printer cartridges, including metals, plastic, toner, foam and rubber, can also be recovered. Responsible cartridge recyclers, like Close the Loop in Melbourne, have a zero-waste-to-landfill recycling process.

In Australia, the mobile phone and printer cartridge recycling revolutions began with the introduction of voluntary extended producer responsibility programs for both products.

**MobileMuster** is a national, not for profit program managed by the Australian Mobile Telecommunications Association (AMTA) on behalf of mobile handset manufacturers, service providers, network carriers and distributors. It is currently the only industry-led mobile recycling program in the world. MobileMuster is a free program for consumers that accepts all brands and types of smartphone and printer cartridge.
types of mobile phones, plus their batteries, chargers and accessories. All components are recycled locally or in developed countries overseas – none are sold for reuse or exported to developing countries.

Since MobileMuster began in 1998, the program has achieved the following results:

- The collection and recycling of 1,014 tonnes of mobile phones and accessories, including 7.7 million handsets and batteries and 544 tonnes of accessories
- The recovery of more than 96 per cent of materials collected through the recycling process – this has avoided the mining of 25,270 tonnes of precious metals ore and the generation of 8,100 tonnes of carbon dioxide (CO₂) equivalent greenhouse gas emissions, which has the same effect as planting 49,400 trees or taking 2,300 cars off the road
- An increase in the collection rates of available mobiles from 18 per cent to 53 per cent
- A decrease in the proportion of people throwing away their mobiles from 9 per cent to 3 per cent.

Since 1998, MobileMuster has collected 1,014 tonnes of mobile phones and accessories for recycling.

‘Cartridges 4 Planet Ark’ collects and returns printer cartridges for recycling, and in some cases for remanufacturing, therefore keeping them out of landfill.

There are currently seven participating manufacturers in ‘Cartridges 4 Planet Ark’ – Brother, Canon, Oce, HP, Epson, Konica Minolta and Kyocera. These manufacturers cover the cost of collecting, transporting and recycling their cartridges, as well as the cost of promoting the program. Cartridges from these participating manufacturers and a range of other supporting manufacturers are sent to Close the Loop in Melbourne where they are hand sorted and have their brand and type recorded. Some of the toner cartridges are returned to the original equipment manufacturers for remanufacture and recovery. All remaining cartridges are processed through the Close the Loop ‘Green Machine’, where:

- Inks are recycled and reused in low grade printing applications and in pens
- Some plastics and metals are sent to specific recyclers for eventual reuse in other plastic/metal products
- Toner powder is recycled to be used as a colorant for black plastics branded LC Black – LC Black is a range of black colorant additives that is suitable for use in plastics in electronics, automotive and consumer products
- All other materials and contaminated plastics are recycled into eWood™ – a timber-replacement product used to make items such as outdoor furniture, fencing, recycling bins, and gardening products, including edging and garden beds.

The partners in ‘Cartridges 4 Planet Ark’ are:

Every day, ‘Cartridges 4 Planet Ark’ diverts more than 546 bags of cartridges from landfill.
Since ‘Cartridges 4 Planet Ark’ began in 2003, more than 22.7 million cartridges have been collected and recycled through the program\textsuperscript{103}. Every day, the program diverts more than 546 bags of cartridges from landfill. An assessment in 2010 by Close the Loop showed that the program up to that time had prevented approximately 16,000 tonnes of greenhouse gases from being released into the atmosphere\textsuperscript{104}.

MobileMuster and ‘Cartridges 4 Planet Ark’ are two of the most well-known and used recycling programs in Australia. Research conducted by Pollinate for this report\textsuperscript{105}, found that 54 per cent of Australians are now aware of MobileMuster and 29 per cent of people have used the program, while 61 per cent of Australians are aware of ‘Cartridges 4 Planet Ark’ and 33 per cent of people have used it.

Between 2003 and 2013, ‘Cartridges 4 Planet Ark’ diverted more than 22.7 million cartridges from landfill.

Join the Revolution!

Gather those old mobile phones and accessories lying around your home or office and take them to one of MobileMuster’s 4,000 drop off points across Australia. Visit MobileMuster to find your nearest drop off point. You can also pick up a reply paid satchel from your local Australia Post outlet, or download a reply paid label from the MobileMuster website, and post your old phones and accessories to MobileMuster.

An even better environmental option than recycling is to extend the life of your phone, by upgrading less often or passing your unwanted phones onto family members or friends.

To recycle used or unwanted printer cartridges, place participating brands of cartridges in a ‘Cartridges 4 Planet Ark’ collection box in all Officeworks and JB Hi-Fi stores, and participating Australia Post, Harvey Norman, Dick Smith, and The Good Guys outlets. Visit RecyclingNearYou or call 1800 24 24 73 to find your nearest outlet.

If your workplace uses more than three cartridges a month, it may be eligible for a free ‘Cartridges 4 Planet Ark’ collection box. Visit ‘Cartridges 4 Planet Ark’ to find out more. Alternatively, visit BusinessRecycling and search under Electrical Equipment to find companies offering printer cartridge pick up services.

For every tonne of mobile phones recovered, 10,000 tonnes of greenhouse gas emissions are avoided.
What is Household Food Waste

Food waste makes up over one-third (35 percent) of household waste\(^{106}\). Household food waste can be divided into three broad categories:

- **Avoidable food waste** – food products that could be eaten but are thrown away due to spoilage or over-catering
- **Potentially avoidable food waste** – food products that could be eaten but are not commonly consumed, such as beetroot greens and pumpkin skins, and
- **Unavoidable food waste** – food products that cannot be eaten, such as banana peels, the shells of nuts, eggshells and bones.

Fresh food, such as fruit, vegetables, meat, fish and dairy products, is the biggest component of food waste (approximately 48 percent)\(^{107}\). The second biggest component is restaurant and take-away food that has been bought but not eaten (20 percent)\(^{108}\).

Generally, the higher a household’s income and the lower its number of occupants, the greater the amount of food waste generated per person\(^{109}\).

The Problem with Household Food Waste

Australian households throw out about 4.5 million tonnes of food every year, enough to fill more than 450,000 garbage trucks\(^{110}\). This food is worth A$5.2 billion\(^{111}\).

Many people think that because food scraps are biodegradable, they do not impact negatively on the environment. However, when food waste ends up in landfill, it rots in the absence of oxygen and produces methane, a greenhouse gas that is 25 times stronger than carbon dioxide at trapping heat in the atmosphere\(^{112}\). The level of emissions generated by household food waste in landfill is estimated to be similar to the total combined emissions involved in the manufacture and supply of iron and steel in Australia\(^{113}\).

In addition to greenhouse gases, decaying food in landfill also produces leachate, a potentially toxic substance that can contaminate surface and ground water if not managed properly\(^{114}\).

When food is thrown out, the soil, water, fuel and resources required to get that food from paddock to plate are also wasted. Around one third of the world’s agricultural land is used to produce food that is subsequently not eaten\(^{115}\). Globally, the surface and groundwater used to produce food that is then wasted is about 250 cubic kilometres, three times the volume of Lake Geneva in Switzerland\(^{116}\). In Australia, the...
agriculture industry uses nearly two-thirds of the total water consumed117. With Australians throwing out so much food, a considerable proportion of this water is therefore wasted, which is clearly a problem in such a dry country.

Global food waste accounts for more greenhouse gas emissions than any single country except China and the United States118. In Australia, the food supply chain is the second-highest emissions-generating activity after power stations119. This includes direct emissions from agriculture, and those attributed to energy use, transport, food production, processing and distribution.

The Household Food Waste Recycling Revolution

The collection and recycling of household food waste by councils is likely to be the next big recycling revolution in Australia. Recycling food waste reduces greenhouse gas emissions and leachate production from landfills, as well as producing nutrient-rich fertilisers and ‘green electricity’. The recovery and re-use of nutrients such as phosphorous is particularly important, as rock phosphate deposits are finite (100–130 years) and crop production will cease without it120. Collecting food waste for recycling can also reduce the impact of landfill levies on councils and help meet the waste diversion and/or resource recovery targets set by most state and territory governments in Australia.

In 2009-10, there were 187 food scrap and garden cutting processing facilities in Australia handling over 5.8 million tonnes of biodegradable residues, including 211,000 tonnes of food scraps.

Up to 12 percent of the Australian population now has access to a council-operated kerbside collection service for food waste121, and an increasing number of councils are considering trialing or implementing food waste recycling. Most councils operating these services provide residents with bench top kitchen caddies and compostable liners, and collect food waste as part of a combined food scraps and garden cuttings collection service. These materials
are then processed by special waste facilities, most of which currently use composting to treat the waste. In 2009-10, there were more than 187 food scrap and garden cutting processing facilities in Australia, handling over 5.8 million tonnes of biodegradable residues, including 211,000 tonnes of food scraps.\(^\text{122}\)

A recent review of ten Australian kerbside food waste collection trials and services found that the services collected an average of 1.8 kilograms of food scraps per household per week and achieved a participation rate of 66 percent. In 2009–2010, ten South Australian councils participated in a large food waste collection and recycling pilot, which engaged 17,000 households and collected 589 tonnes of food waste.\(^\text{124}\)

**Join the Revolution!**

Visit [RecyclingNearYou](#) and do a location search to find out if your council offers a kerbside food scraps collection service. If there’s no service yet on offer, set up a compost system, worm farm or Bokashi bucket at home. Many councils and community gardens regularly run composting and worm farming workshops to help you get started. You could also contact your local community garden to find out if you can contribute food scraps to their composting system, or ask any neighbours with chickens if they could use extra scraps.

The Pollinate research conducted for this report found that while 50 percent of Australians throw their food scraps in with their general rubbish, 24 percent put their scraps in a worm farm or compost bin, 10 percent feed their scraps to chickens or other livestock, and 13 percent use a council-operated food waste recycling service.\(^\text{125}\)

Of course, reducing the amount of food you waste is the best environmental option. Visit [Love Food Hate Waste](#) to get some great tips on reducing food waste. The site includes information and resources on everything from meal planning to using leftovers.

If you’re a business that regularly or occasionally has leftover food to dispose of, contact one of the many food rescue organisations now operating around the country. OzHarvest, Second Bite and FoodBank are three national organisations, but there are also many smaller, local services available. Some organisations may also accept leftovers from private events such as weddings or parties.
CONCLUSION

Recycling has progressed in leaps and bounds over the past 25 years. Never have we been able to recycle so many different materials, quite so easily, as we can now. However, developing and implementing new recycling programs, and improving existing ones, is just one part of the equation to make these systems as effective as possible. Equally critical is making sure people are aware of the programs, know how to access them, and understand how to use them correctly. Recycling at home is probably the most common voluntary activity Australians undertake on behalf of the environment.

The seven recycling revolutions outlined in this report have come about because of the support and actions of individuals, state and federal governments, businesses and councils, and they reflect social and economic changes. Without this broad support, none of the revolutions could have succeeded. Whether a recycling program is established to process e-waste, soft plastics or food, they all depend upon similar criteria to be successful: the program needs to be promoted and understood; people need to return the material for recycling; individuals, governments or businesses need to cover the costs; the technology required to sort, dismantle and process the materials needs to exist; and there needs to be a market for the outputs. The growth of the programs showcased in this report is a testament to how far we’ve come in the last 25 years.

Over the past two decades, Planet Ark has worked with schools, workplaces, councils and individuals to help ensure the success of numerous recycling revolutions. By running campaigns like National Recycling Week and ‘Cartridges 4 Planet Ark’, by providing information services like RecyclingNearYou and BusinessRecycling, and by partnering with business and industry initiatives like the Australian Packaging Covenant, Century Yuasa Battery Recycling Centres, MobileMuster and TechCollect, Planet Ark has helped enable positive environmental actions for everyone.
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