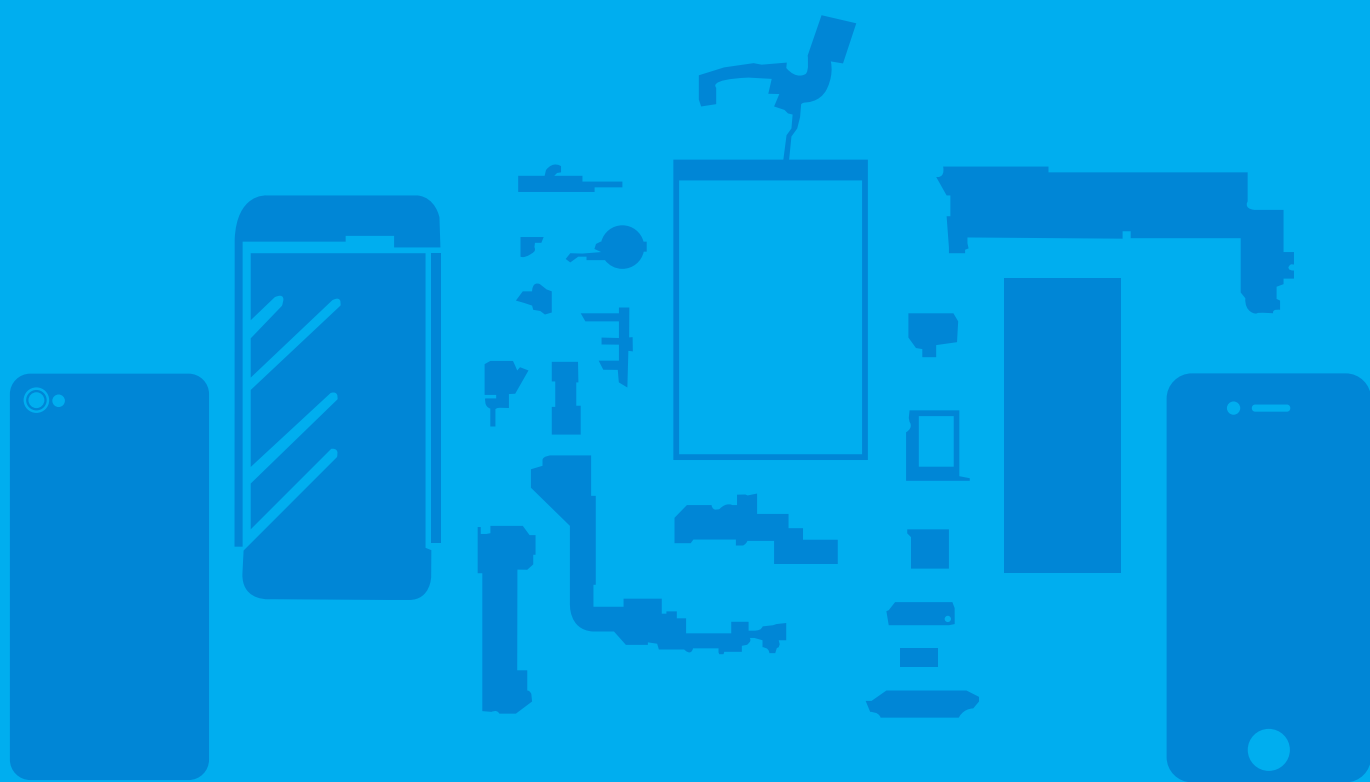


2018

Annual Report



Introduction

It is estimated that in Australia e-waste is growing three times faster than any other waste stream.



For many of us, knowing what to do with old technology can be challenging, and all too often people see the solution to be to store their unwanted technology at home or in the workplace.

However, the mobile telecommunications industry in Australia is committed to changing that and it has voluntarily invested almost \$45 million in Mobile Muster, to raise consumer awareness around the benefits of recycling and reusing old mobile phones while providing a free take back program.

Mobile Muster's success is built on its solid collection network developed over 20 years. The network consists of a retail footprint of over 2,000 stores along with almost 400 participating local councils. The drop off network is also supported with a free post back option.

Mobile Muster holds a voluntary accreditation under the Product Stewardship Act 2011. It was established by the mobile phone industry in 1998 to provide an environmentally sound recycling program to keep mobiles out of landfill and optimise resource recovery.

The accreditation provides certainty to the community and industry that the program is safe, secure and performing to the highest environmental standards. Mobile Muster ensures that everything it collects is recycled and any data left on devices is destroyed as part of the recycling process.

Product stewardship is not just about recycling.

The mobile phone industry is constantly working to reduce the environmental impacts of its products throughout their life cycle. From improving product design and the materials used in manufacturing to extending the life of the product through reuse, recycling and recovering resources like valuable metals, plastics and glass that can be used as part of the circular economy.

Looking ahead to the introduction of the 5G network, there will be significant growth in mobile enabled connected devices in Australia – from wearables, household gadgets to industrial sensors, all taking advantage of the new technology. Mobile Muster will take a proactive approach to product stewardship responsibilities as new products enter the market and continue to look to expand the scope of the program, a recent example is that we now also accept smart watches.

The Australian Mobile Telecommunications Association (AMTA) manages Mobile Muster on behalf of its members.

Members of the program include Alcatel, Apple, Google, HMD Global, HTC, Huawei, Microsoft, Motorola, Oppo, Samsung, ZTE, Telstra, Optus and Vodafone.

Foreward



Chris Althaus CEO – AMTA

The mobile industry is looking towards new, more holistic approaches to using resources and providing services to customers as part of an increasingly circular economy. In terms of the supply chain, this means the industry is increasingly using recycled materials and renewable energy to enable the sustainable and repeated use of resources.

Recycling programs, like Mobile Muster, play a critical role in the circular economy by recovering the useful resources from mobile products once they reach the end of their lives. Mobile Muster strives to maintain high recovery rates to turn waste into resources while working with the recycling sector to improve recycling processes and outputs in Australia.

Extending the life of mobile products and components through reuse and repair is also becoming increasingly common and it is supported by the industry through service centres and stores throughout Australia. Our carrier members are transitioning to new business models to enable them to offer new approaches like product leasing, upgrading and refurbishments to help extend products life cycles.

Beyond the supply chain, mobile technology is the perfect enabler for the circular economy. It supports the sharing economy through the ubiquity of the technology and services which support the pervasive connectivity people enjoy – linking individuals, families and communities. Mobile technology enables increased product sharing, co-use and exchange of goods.

In our increasingly online environment, the mobile industry is a key enabler for new business models to flourish – in some cases replacing physical products with virtual alternatives like news media or online retail. Mobile enabled services often require fewer physical resources so also support more sustainable practices.

We look forward to the evolution of the next mobile generation – 5G – as it will offer many more opportunities to grow the circular economy. For instance, it will enable new and innovative use of machine to machine communications, or the 'internet of things', as well as more advanced mobile broadband services that will improve performance attributes like greater energy efficiency and longer battery life.

5G technologies will also enable remote interactions between customers, suppliers and goods themselves via connected sensors all linking into a vast data analytical capacity. This high level of remote control, predictive maintenance and automated monitoring has huge flow-on potential for more efficient use of resources. In short, the future will be based on an increasingly connected economy and society and improvements in sustainability will be a key outcome.



Spyro Kalos Manager

The past year has certainly put the spotlight on Australia's recycling industry. Policy changes in China, the review of the Product Stewardship Act and ABC's War on Waste series, have started many conversations about how we should tackle e-waste. With the onus not only on Government and industry to find solutions to the issue, it is also timely to have consumers join the conversation, as we all need to play our part.

As technology evolves, the old things become obsolete. The challenge of what to do with old laptops, tablets, computers, monitors, power tools, and other devices once they break down, become out dated, or get replaced by improved versions is real for many consumers.

Technology and specifically mobile phones play an intrinsic role in peoples' lives as they help us be productive in the work place and stay better connected with our communities. We do more and more on them than ever before. We have moved on from the days when mobiles were only about making calls or sending a text message. Today with smartphones we can do our banking, emails, take pictures, store books and more. Technological developments have led us to do more on mobile than ever before with rapid convergence of technology negating the need to have separate devices like cameras, e-readers, and music players.

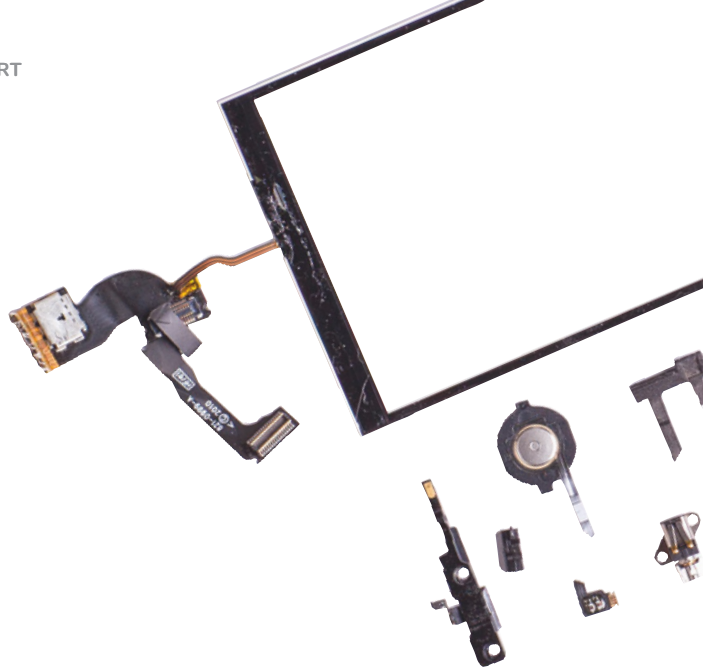
Everyone has a role to play in recycling the products they use. Industry has a leading role to play in implementing product stewardship frameworks in managing products at the end of their useful lives. Our product stewardship program is funded by the telecommunications industry and is unique in the sense that manufacturers and network service providers work together to deliver a robust take back program to encourage people to recycle.

In 2018 our program collected 90 tonnes of mobiles and accessories and we have had continued growth year on year for the last four years. However, there are still millions of mobiles stored in our homes and for any scheme to work everyone needs to play their part. As always, Mobile Muster is committed to growing awareness of mobile phone recycling by educating consumers on how, why and where to recycle the right way.

This year we launched our Mobile Connections education program which provides the next generation with the knowledge and skills to take positive action for sustainability and become advocates of the program.

In 2019 we will focus on educating people on how to better manage their data by giving them the tools to reuse or recycle their phones when they no longer work or are needed. We understand the increasing consumer concerns with data security and the need to develop effective programs to manage this barrier to recycling.

The work of Mobile Muster highlights how voluntary schemes funded by industry can work to bring real social and environmental benefits to our community.



Key highlights

A snapshot of our achievements



70,000 meals

Delivered through OzHarvest partnership



90 tonnes

Recycled mobile phone components this year



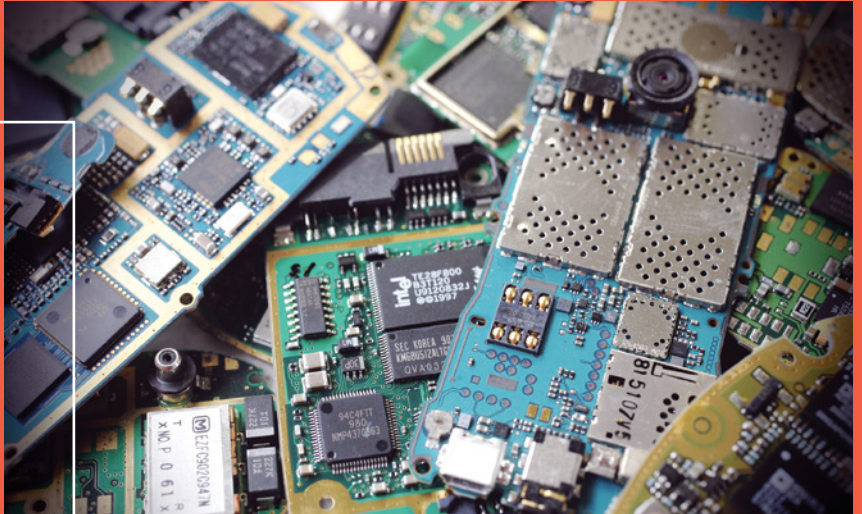
Over 90%

of manufacturers participating



99%

Resource recovery rate



Over 200 devices

Delivered to Able Australia helping deaf blind people stay connected with their community



1,412 tonnes

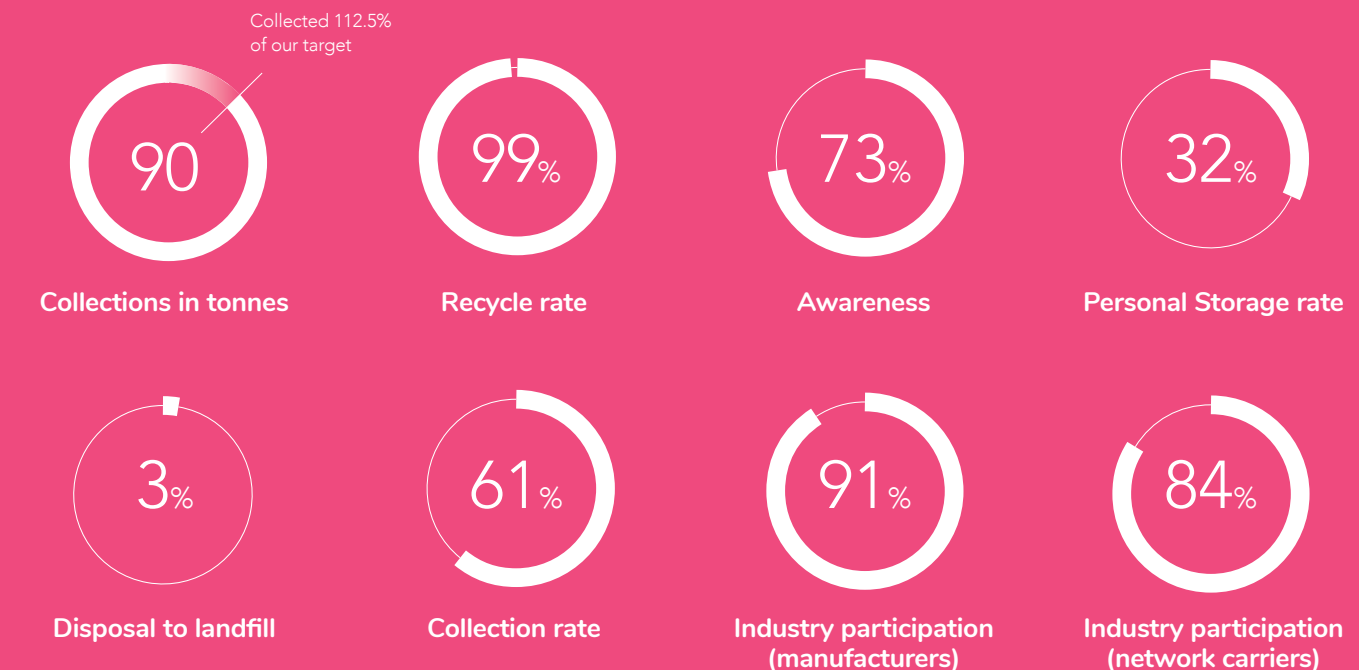
Collected and recycled mobile phone components since 1998

Program performance

In 2018, Mobile Muster grew collections for the fourth year in a row, collecting and recycling 90 tonnes of mobile phone components which equates to over 1.2 million handsets and batteries. Total collections, since the program started have reached 1,412 tonnes, including approximately 13 million handsets and batteries recycled the right way.

The performance of Mobile Muster is measured against 11 performance indicators that look at changes in consumer behaviour, collection and recycling rates, diversion from landfill and industry involvement.

Key Performance Indicators



Footnotes definition

Personal storage rate % users with 2 or more handsets at home.

Awareness Awareness of mobile phone recycling.

Collection rate Annual collection rate, available phones (%).

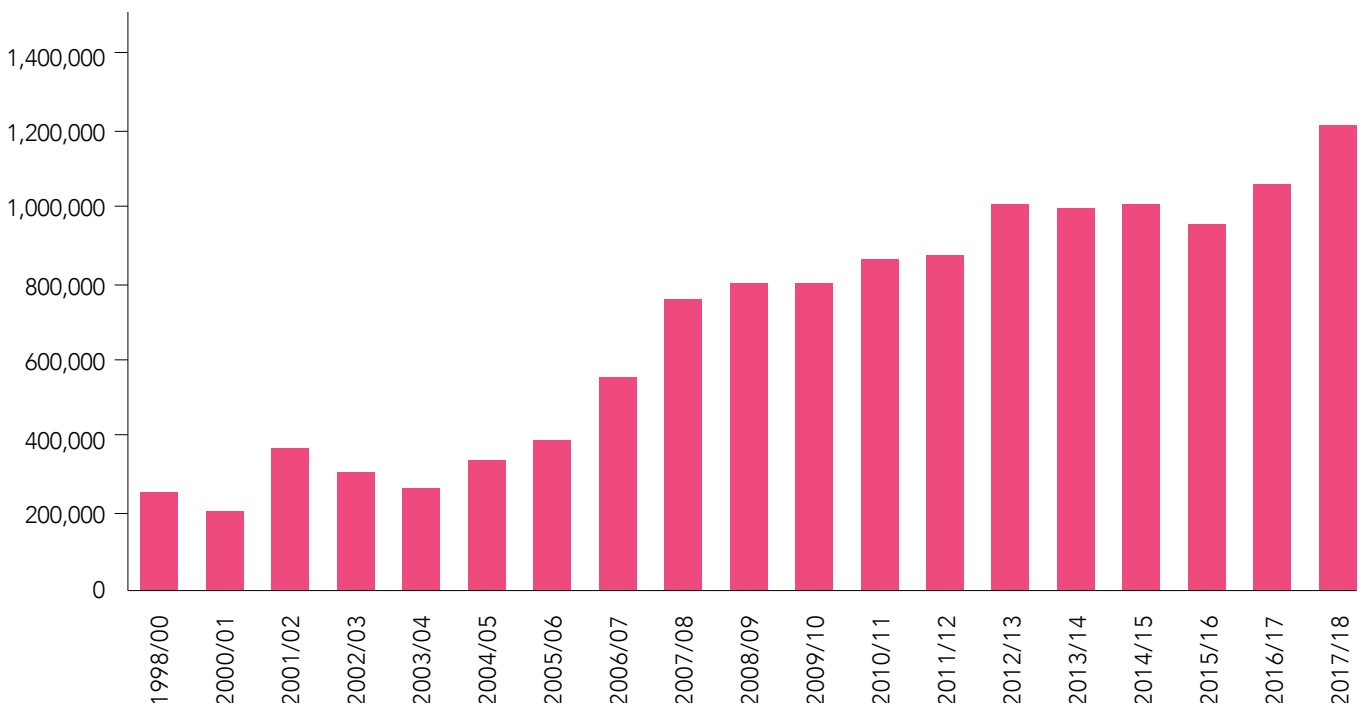
In addition to the volumes reported by Mobile Muster, there are also a number of other recyclers that recycle mobiles and accessories through their own collections. These programs report their collected volume to AMTA. From the available data provided to Mobile Muster a further 12,827 kgs was collected and recycled by these organisations.

Even though Mobile Muster heavily promotes what products and accessories the program accepts, it still receives out of scope product through its collection channels. In 2018, this included 10.2 tonnes of product mainly made up of e-waste such as tablets, modems, digital set top boxes, landline phones and alkaline batteries.

These out of scope products are an added cost to running the program, regardless the products are also recycled by our recycling partner, TES, to the highest environmental standard.

Ultimately, Mobile Muster understands that people want to do the right thing and recycle, but where there is a lack of a collection network or stewardship schemes for broader e-waste products, other industries need to step up and provide a robust solution like Mobile Muster.

Total number of batteries and handsets collected from November 1998 to June 2018



Partnerships

Over the last 10 years Mobile Muster has worked with charity partners to motivate more Australians to recycle their unwanted mobiles, whilst also giving over \$1,000,000 to support local causes. Social causes provide non-recyclers with an added incentive beyond the environmental benefit. Simply by recycling a mobile phone a person can help someone in need – action equals outcome.

Currently 73% of Australians are aware of mobile phone recycling and one in three Australians have recycled a mobile phone.¹ Despite high levels of awareness, Australians continue to hold on to their old mobiles, many of which are redundant. While Australians admit to storing five million old handsets that are broken or not working.²

Mobile Muster works with partners to increase its collection network and build greater awareness of mobile phone recycling throughout the community. Together with partners, Mobile Muster can raise even more awareness of how, why and where to recycle, as well as provide incentives for consumers to take action and recycle the right way.

1 IPSOS, Consumer insights into mobile phone use and recycling (February 2018). It was based on a used sample size of 1001 people Australia-wide. Respondents were randomly selected from an online panel and were over the age of 16 with a mobile phone.

2 IPSOS , 2018.



Salvos

Mobile Muster continues to support the Salvos by giving \$2 for every kilo of mobiles and accessories collected in-store. The money raised helps the Salvation Army's Red Shield Appeal and Salvos Store. The partnership with the Salvation Army helps to increase the range of goods people are able to recycle at their local store whilst also generating extra funds for their programs. Over 1.2 tonnes was collected and recycled through the Salvos Store network.

Able Australia

Mobile Muster partnered with Able Australia, a leading not for profit organisation who provide services and support for people living with deaf blindness. In September 2017, Mobile Muster asked corporate Australia to support Able Australia by donating unwanted smartphones for reuse.

The program collected, tested and data wiped the smartphones, so they could be used by Able Australia to educate people with deaf blindness to use speech recognition and Braille readers through mobile technology. The smartphones delivered to Able Australia play a vital link that can transform a socially isolated person with deaf blindness into an active member of their local community. Something most of us take for granted. The initiative delivered over 200 suitable smartphones to a great cause.

OzHarvest

This year Mobile Muster's main awareness driving campaign was a joint initiative with OzHarvest, Australia's leading food rescue agency. The Do Some Good campaign aimed to tackle two of the fastest growing waste issues in Australia, e-waste and food waste. We worked to raise awareness of Mobile Muster while providing an added incentive to motivate people to recycle more mobiles over summer.

The campaign promised to deliver the value of a meal to an Australian in need for every mobile recycled during January and February. As a result, the program recycled over 70,000 mobiles, and helped OzHarvest deliver 70,000 meals to those in need, that was 10,000 more meals than last year.

Planet Ark

Mobile Muster has a long running partnership with Planet Ark, Australia's leading environmental behaviour change organisation. Planet Ark plays an active role in amplifying Mobile Muster's message educating those who are ready to recycle, to find out how and where they can take action.

Last year Planet Ark reported over 43,300 visits to their recyclingnearyou.com.au website for individuals looking to specifically find more information on recycling their mobile.

The partnership also sees Mobile Muster be an active sponsor of Planet Ark's National Recycling Week which includes joint promotions focused on mobile phone recycling using social media, radio and TV community service announcements as well as mainstream media coverage reaching over one million Australians.



Collaborating with our collection networks

Mobile Muster's collection network is made up of over 3,500 public drop off points and includes over 2,000 retailers which are an important part of the success of the program. The national network makes it easy and accessible for people to recycle unwanted mobiles and accessories across Australia and consists of all major mobile phone retailers, Telstra, Optus, Vodafone, Samsung and Officeworks Stores. The retail channel contributes over 35% of the overall collections received by Mobile Muster and provides a logical option for consumers to use to take back their mobiles for recycling.

Mobile Muster's partnership with Australia Post provides an alternate option to the program's drop off network. It allows mobile phone users to pick up a reply paid satchel from AusPost outlets and post back their mobiles and accessories for recycling for free. For 2019, we are enhancing the program to develop a solution to allow for online tracking of the satchel to enable people to know when the satchel has been delivered to the recycling warehouse. This will also expand to the online label that can be downloaded from the Mobile Muster website.

In 2018, Mobile Muster partnered with over 370 Councils from around the country. Councils play a crucial role in encouraging the community to recycle and over the last 12 years they have done an incredible job of delivering almost 34 tonnes of mobiles and accessories for recycling.

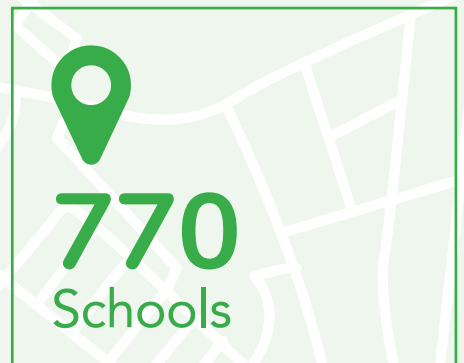
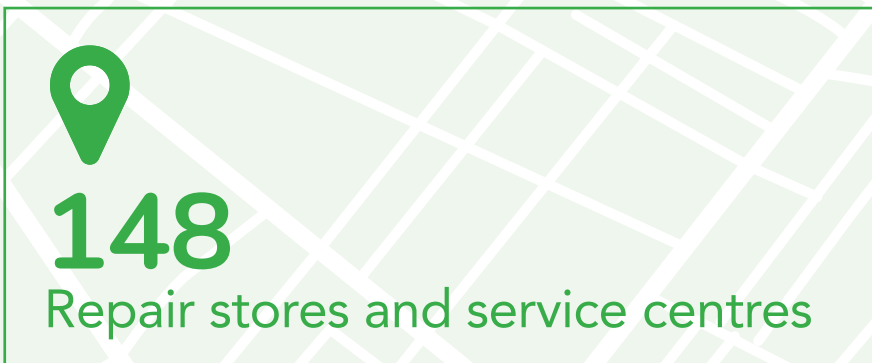
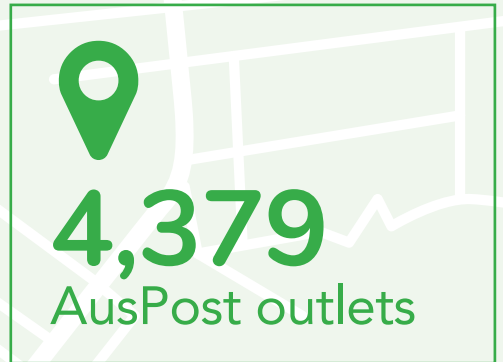
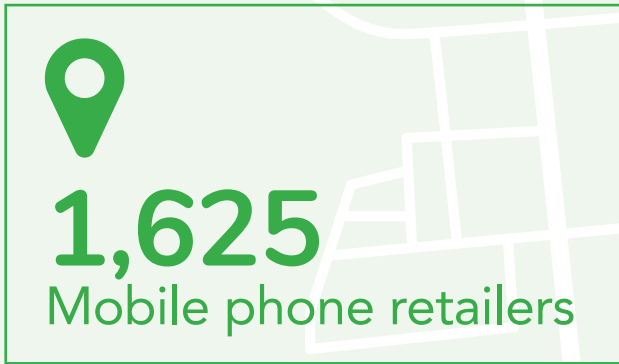
Part of their role is to provide a public drop off network for their residents but at the same time help in promoting and educating their residents on the importance of recycling. In 2018 councils collected over 4.7 tonnes of mobiles and accessories for recycling last year, an increase of 12% on the previous year.

Each year Mobile Muster recognises the top collecting Councils from around the country. In 2018, the top collector per capita was the District Council of Kimba and the top collectors in each state and territory are included below:

- New South Wales** Hornsby Shire Council
- Northern Territory** Alice Springs Town Council
- Queensland** Brisbane City Council
- South Australia** City of Onkaparinga
- Tasmania** Waratah Wynyard Council
- Victoria** Nillumbik Shire Council
- Western Australia** City of Stirling



Our collection network





Sean O'Malley from Planet Ark, Andrew McKenzie and John Polhill from EnviroStream and Spyro Kalos from Mobile Muster visiting EnviroStream's recycling facilities in Melbourne.



Sean O'Malley from Planet Ark, Andrew McKenzie from EnviroStream, Hon. Lily D'Ambrosio MP Minister for Energy, Environment and Climate Change, Mary-AnneThomas MP, Spyro Kalos from Mobile Muster

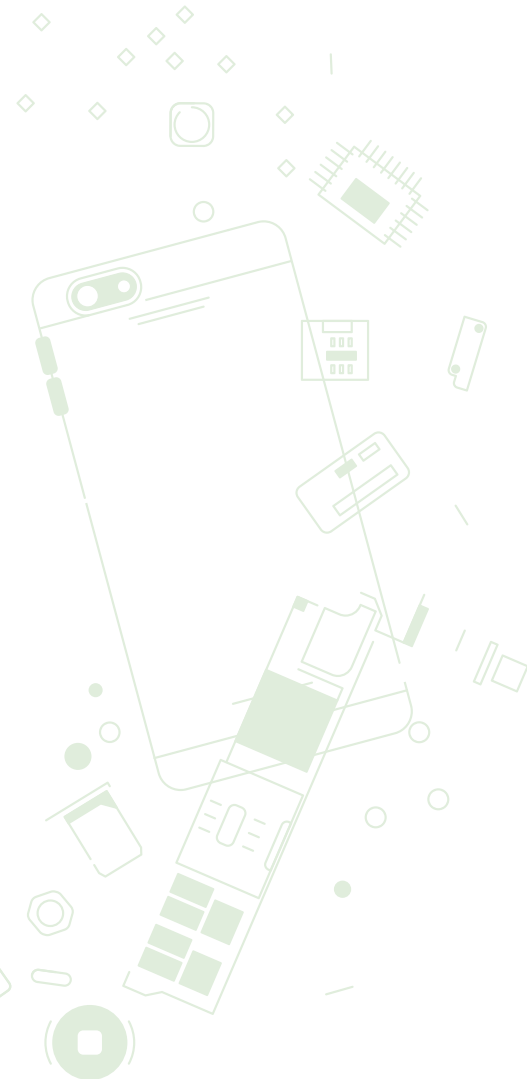
Innovative recycling partnerships

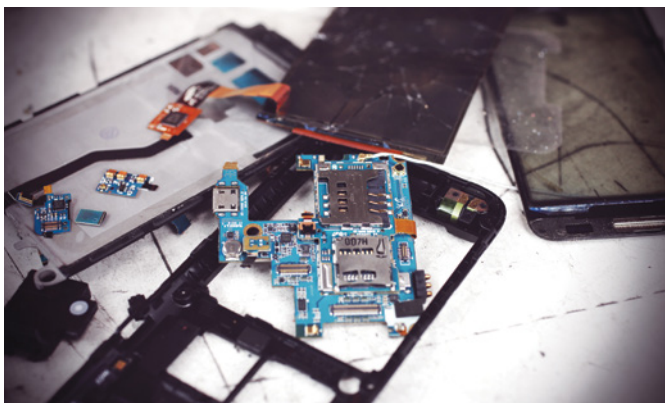
Mobile Muster's recycling partner, TES, is a global leader in electronic waste recycling. This partnership maximises recovery rates and ensures all the mobile phone components collected are properly processed in an environmentally responsible manner to the highest standards.

TES maintains international best practice certifications; R2 (Responsible Recycling AS/NZS 5377), ISO 9001, 14001, 27001, 28000, OHSAS 18001, and TAPA, ensuring transparency and accountability of the downstream recycling process and data to better understand and evaluate the program.

Mobile Muster is proud to support innovations that enhance the recycling process and this year TES started using Envirostream to process the mobile phone batteries within Australia. Through Envirostream's facilities in Melbourne the batteries are granulated and sorted into materials for recycling. The process recovers copper, aluminium, cobalt, nickel, lithium and plastics which can be reused as part of the circular economy.

Envirostream has developed an onshore solution, reducing the need to transport the batteries internationally for processing, while utilising skills and innovation within Australia and creating local employment opportunities.





Reuse

Research shows that consumers are holding on to their mobile phones for longer with over half the population using their mobile phone for two years or more.³ Consumers can update the software and battery on their smartphones without needing to update the hardware. It is estimated that one in five Australians sell, trade-in or give their old mobiles to family or friends.

“Extending the life of products is an important principle of product stewardship and will reduce their environmental impact.”

The mobile industry helps consumers extend the life of their phone through their repair and reuse programs:

- Manufacturers provide service centres and repair services to replace mobile phone parts so that consumers can continue to use their mobiles for longer.
- Network carriers offer leasing and trade-in programs where consumers can trade or return their mobile phone and receive a credit on new products or services.

These options help extend the life of mobiles and potentially provide better access to communication for more people.

Mobile Muster partners with several commercial reuse programs in Australia as their recycling partner ensuring that any mobiles and accessories which have no resale value are recycled properly. These commercial programs also collect old mobiles on behalf of charities and share the funds raised by reselling them.

Last year Mobile Muster collected a total of 1,249kg from reuse programs. Mobile Muster also works with service centres and repair shops by accepting scrap from the work that they do, this is waste generated from parts that have been replaced or repaired.

³ IPSOS, Consumer insights into mobile phone use and recycling (February 2018). It was based on a used sample size of 1001 people Australia-wide. Respondents were randomly selected from an online panel and were over the age of 16 with a mobile phone.

Working with schools

Mobile Muster is committed to delivering a program that provides teachers and students with comprehensive educational resources that focus on exploring personal connections to mobile technology and the impact it has on society, the economy and the environment.

“We hope to inspire the next generation of students to take action for a sustainable future.”

This year we launched our Mobile Connections program for Geography teachers and students. Mobile Connections is aligned with the Australian Geography curriculum and relevant state and territory curriculums. The Curriculum Guide provides teachers with over 22 lessons which they can incorporate into the interconnections content area and covers personal connections, technology, trade, production and consumption all through the lens of a mobile phone.

Mobile Connections is supported by digital resources that have been developed by Mobile Muster to bring the program to life in the classroom. Teachers and students can access animations, interactives, a multimodal book and reference material for free through the Mobile Muster website.

An important component of Mobile Connections is to encourage teachers and students to conduct a recycling event for their community. The program helps students to design and implement positive actions for sustainability.

Mobile Muster partnered with educational experts and teachers from the Field of Mars Environmental Education Centre and Cool Australia to develop the curriculum resources and accredited professional learning course. The professional learning course unpacks the Mobile Connections unit and looks at how teachers can integrate the use of technology and the Sustainability Action Process into the classroom. Mobile Connections has also been reviewed by curriculum experts and key stakeholders ensuring the program delivers quality teaching and student learning outcomes.

“Mobile Connections provides some really relevant and interesting ideas that teachers can use in the classroom. Themes such as mobile commerce and the circular economy are vital concepts for our students to understand in our rapidly changing world.”

Anna Haigh,
Head of Geography, Melbourne Grammar School



Our recycling process and its environmental benefits

Mobile Muster ensures that all the materials that have gone into making a mobile phone can be turned into new products. It means that fewer raw materials need to be extracted and processed which reduces the need to extract materials from the earth which saves energy, conserves scarce natural resources and protects our environment.

“Through our recycling 99% of the materials in a mobile phone are recovered so they can be reused again.”

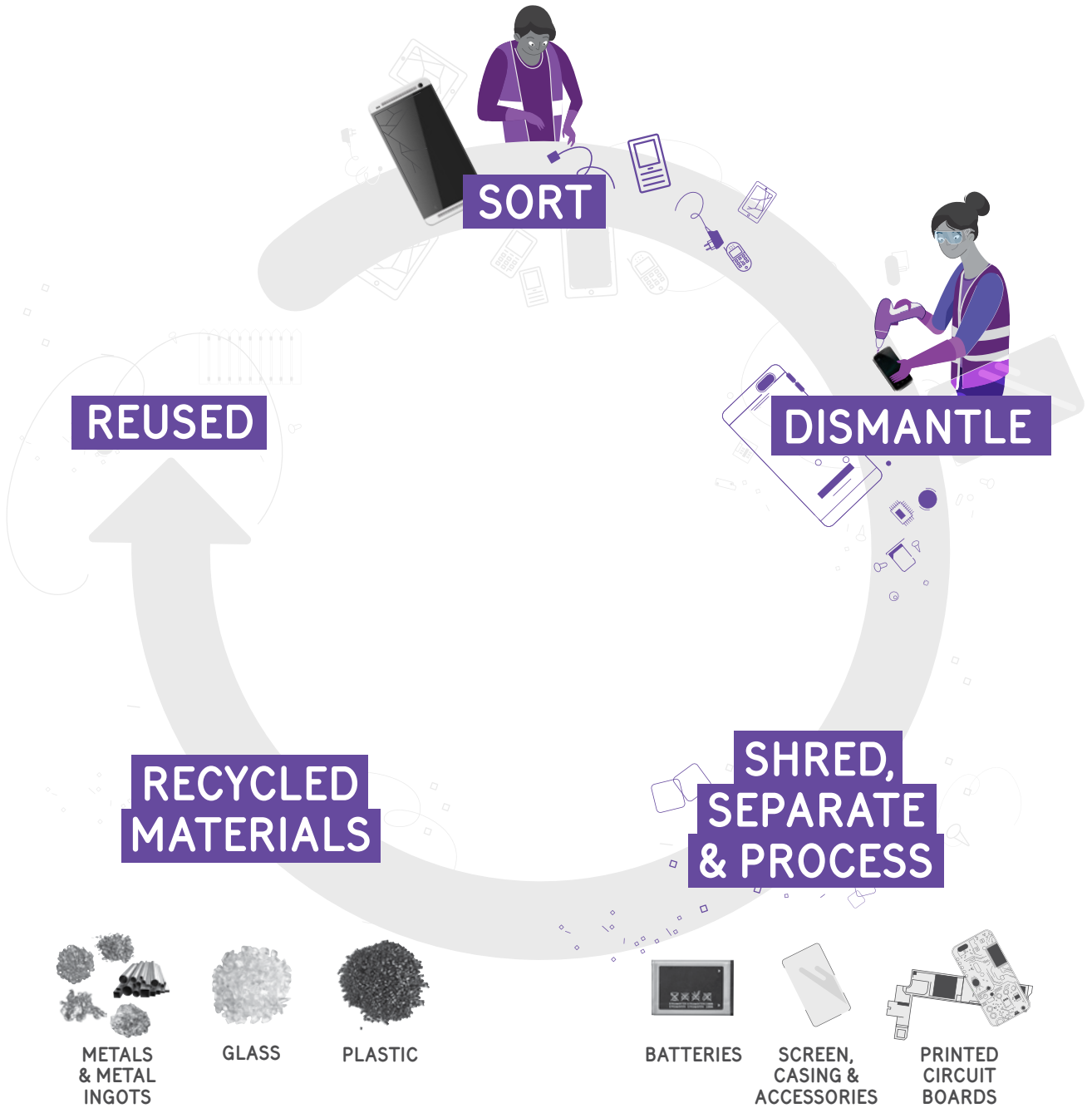
Strong results demonstrate the positive effect the program has on reducing the impact of mobile phones on the environment, maximising the materials that can be recovered and promoting the development of a circular economy.

All Mobile Muster collections are transported to TES's recycling facilities in Melbourne, Sydney or Brisbane. Here the mobile phones are disassembled into their components. None of the phones are resold and any data left on devices is destroyed through the recycling process.

Once disassembled the parts are sorted into the various components including batteries, printed circuit boards, handsets, accessories, plastics, metals and packaging. The components are then further processed by TES and downstream recyclers, using state of the art equipment to maximise resource recovery.

The materials recovered in the recycling process are returned to the supply chain and used in the manufacturing of new products. For example, the recycled plastic from mobile phone cases are used to make shipping pallets and the lithium extracted from batteries can be reused to make new batteries.

What happens when you recycle?



Life cycle analysis



In 2017 AMTA engaged LifeCycles to complete a life cycle analysis of the Mobile Muster program, to quantify the environmental benefits, and any impacts, of the recycling scheme in Australia. The results are being used to communicate the benefits of recycling unwanted mobile phones to consumers, and are supported by Mobile Muster's interactive calculator which shows the positive impact of the program.

How it works

Life cycle assessment (LCA) is a methodology for assessing the full cradle to grave environmental benefits of products and processes by assessing the environmental flows at each stage of the life cycle. The LCA aims to include all important environmental impacts for the product system being studied. It is hoped that by including these environmental impacts, the study results avoid the shifting of impacts from one life cycle stage to another and from one environmental impact to another.





There are a wide variety of indicators available in a life cycle assessment. However, in this analysis, a relevant subset of indicators were selected that are typically associated with electronic equipment, its production and disposal, and indicators that have a high degree of relevance.

The selected indicators are:

- global warming
- mineral resources
- fossil fuel resources
- summer smog
- particles
- human toxicity

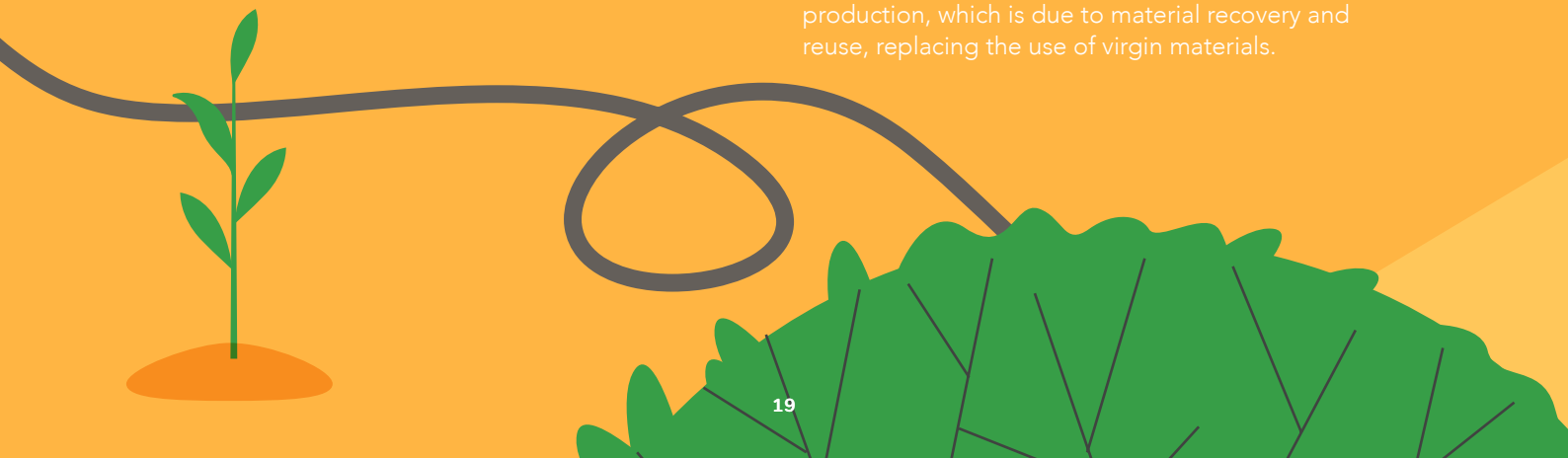
The material and energy flows collated in the previous section have been used to calculate the benefits (and any impacts) of recycling across the entire life cycle, as opposed to leaving the phones in a drawer or disposing of them in the bin.

**TABLE 1
SUMMARY OF ENVIRONMENTAL BENEFITS
FOR RECYCLING 1 STANDARD MOBILE PHONE
THROUGH THE MOBILE MUSTER PROGRAM**

Category	Unit	Value
Global warming	g CO2 eq.	386
Mineral resources	mg Sb eq.	1,970
Fossil fuels resources	MJ NCV	4.23
Summer smog	g C2H4 eq.	0.648
Particulates	g PM2.5	1.11
Human toxicity	CTUh	1.64 e-06

The environmental benefits

The benefits are derived from avoided material production, which is due to material recovery and reuse, replacing the use of virgin materials.



Environmental benefits in 2018

Saved 200t CO₂ emissions from entering the atmosphere

Conserved 1000t of mineral resources through recycling

Saved 218 GJ of fossil fuels by recycling

Avoided 330kgs of summer smog pollution

Avoided 570kgs of particulate pollution



This is equivalent to planting 5,180 trees.

