



University Recycling Initiatives Guide:

Aim of the Guide: Supporting universities to rethink, reduce, reuse and recycle

Background

Most of the landfill sites in the metropolitan areas in South Africa are close to reaching full capacity. As a result of the financial and administrative implications of this reality, a drastic departure away from the historical 'rubbish dump' mentality is taking place. At the same time, there are major issues relating to climate change and public health that force all interest groups in public life – from government to academia, business, consumers and environmentalists among others – to find and implement new ways of thinking that will not only save on landfill space, but relook the way that resources are managed in general.

In terms of the **legal framework**, the **National Environmental Management: Waste Act** (No. 59 of 2008) that came into effect on 3 July 2009, was amended first in November 2013, and again in June 2014. Its overall purpose is to regulate the management of waste in order to protect public health as well as the environment supporting human living conditions (plants, animals, land, air, water, etc.)

The Waste Act introduced the **extended producer responsibility** (EPR) policy principle, whereby industrial bulk waste generators can be made *directly responsible* for the waste impact they cause. This policy instrument now stimulates and motivates pro-active industry-driven waste reduction, recycling and public education initiatives, and has been shown to minimise illegal dumping, pollution (and with it, harmful effects on both the human health and the environment we live in), while offering the growth of a local green economy and related green jobs.

Government now also embraces the notion of **integrated materials management**, rather than simply using the term 'waste management'. This approach acknowledges that most of the items that households, businesses and others have been sending to landfill in the past (e.g. packaging materials such as used PET beverage bottles) are in fact NOT valueless waste. Instead, these items should be managed as resources with intrinsic value – value that can be recovered through the fast-growing local recycling economy, which will also create green job opportunities.

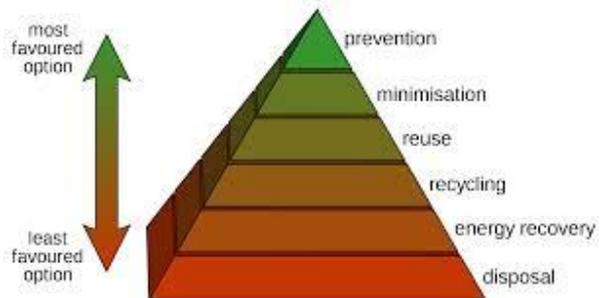
This thinking also corresponds with current approaches about concepts such the **circular economy**, which links the output of a process with its the inputs, and where there is intentional, planned use



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and reuse of resources in such a way that there is no (or limited) material loss. It draws on concepts of 'closing the loop' and 'cradle to cradle' solutions in industrial and commercial value chains that are by their very nature circular, as is recycling: it responsibly limits the use of primary resources and environmental impact along the entire value chain. It also requires integrated thinking and action – from design, through manufacturing, logistics, marketing and finally post-consumer recycling.

The **National Waste Management Strategy** (NWMS) gives effect to the objects of the Waste Act, and it provides a framework for inspired action. By defining 'waste disposal' as the least preferred and acceptable waste management option available, South Africa's integrated waste management hierarchy (see illustration) gives clear preference **to rethinking the source and cause of a waste problem instead of simply dealing with the consequences.**



There are many opportunities for universities to contribute to the successful implementation of the NWMS: in addition to the research done on materials handling, engineering solutions, city planning and more, universities and other tertiary academic institutions also accommodate many people at their own campus facilities all over South Africa.

This guide is intended to assist campus management and it is strongly encouraged to partner with PETCO to achieve nation-wide recycling targets while setting a good example for students. The commitment of a university to be an 'environmental change agent for future generations' can be turned into action among others through introducing waste reduction and recycling initiatives on its campus(es).

Designing a PET recycling programme: 7 steps to success

In line with the national waste management hierarchy, the main steps to implementing source reduction and reuse programmes at any campus would be in essence to:

- **Obtain buy-in** from university academic and administrative management
- **Appoint a project coordinator** and campus **waste reduction committee**
- **Analyse** different aspects of a campus' operation to identify potential sources of **preventable waste** through a **waste audit**
- **Train** facilities management department staff to identify both the major waste streams and recyclable material sources
- Set up a collection **infrastructure**
- Set up relevant **training and communication** processes
- Communicate effectively on campus about the programme



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STEP 1: Secure official and administrative support

Establishing a successful recycling programme requires motivating the entire campus community to participate.

It is therefore of key importance that **university authorities** are aware of, approve and support the aims and implications of such a programme. Work within the accepted lines of authority, and where necessary with the help of the marketing and communication departments, to ensure that this basic requirement is met. Without senior management approval, it will be more difficult to implement a wide-reaching programme that will require commitment from staff and students alike.

Ideally, the vice chancellor (rector) - or failing that, or another member of the top management of the university authority - should be approached to endorse the programme publicly and to be seen as its 'champion'.

- A memo from the vice chancellor's office would have built-in credibility and go a long way to alerting the entire campus to the programme. Ideally, it should introduce the programme objectives, and also ask directly for everyone's participation.
- Similar statements or resolutions of support, targeting specific segments of the campus population, can come from student leadership and residence councils, or from the waste management department.
- The media and communication departments of the university would be in good position to communicate about the programme and facilitate access to other departments. Obtain their support as early as possible. (Also see Step 7.)

STEP 2: Appoint a recycling/waste reduction coordinator

Vital to an effective programme is the appointment of a waste reduction and recycling **coordinator**. The coordinator plays a lead role in creating the integrated waste management plan that guides the materials recycling programming, and works to implement it on a long-term basis. This person can be expected to coordinate different tasks such as:

- Overseeing recycling contracts and agreements
- Maintaining compliance with national and municipal regulations
- Researching programmes in particular about similar university initiatives
- Networking with other coordinators from other campuses
- Preparing and managing budgets
- Developing promotional material and education programmes for staff, faculty, and students
- Developing meaningful and stable communication channels to reach staff, faculty and students and provide regular programme updates
- Tracking recycling and solid waste tonnages, and calculating diversion reports
- Maintaining equipment
- Training
- Supervising collection and education staff
- Preparing reports and proposals
- Promoting the programme to the campus community



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Initially, the project coordinator will need to spend time on the **analyses of the current situation** and communicating with key campus personnel, including relevant members of the various academic departments, campus administration and cleaning staff, as well as managers of student recreational areas. By observing and discussing their work routines and soliciting their feedback, the coordinator will be able to assess their particular role and impact on the campus' overall waste generation volumes and types of waste.

Once potential source reduction initiatives have been identified, the coordinator would have to work with the waste reduction committee (see Step 3) and relevant decision-makers to suggest the necessary operational changes. The director and staff of the department in charge of procurement will have to play an important part, since they are in a position to influence the purchasing decisions of the rest of the university and to identify wasteful practices.

Here are some other important things to consider:

- Campus tuck shops (and the decision of what kind of food and beverages they are allowed to sell in what type of packaging) typically play a major role in meaningful source reduction of non-recyclable waste. Preference should be given to 100% recyclable packaging solutions such as PET bottles.
- In addition to educating people about source reduction and reuse practices, the coordinator would need to help implement formal policies and procedures. If there is already a solid waste reduction committee in place, it would be important to work with them.
- If the university is part of any other 'greening' initiative it makes great sense to place a waste reduction programme under the same banner and utilise the same people already involved rather than to design a programme in isolation and from scratch.
- When proposing source reduction policies, remember also that cost savings are more likely to sway decision makers than environmental concerns. Although the resource conservation argument may be more compelling to student activists or even the programme coordinator, administrators and department directors are more likely to appreciate the fiscal impact.

STEP 3: Elect/appoint a campus waste reduction committee

The role of this committee is to investigate waste reduction and recycling options for the campus. It should be comprised of administrators, staff, faculty, and students representing a cross section of people on the campus.

Working with the waste reduction coordinator, the committee would:

- evaluate current solid waste management plans and practices on campus
- create a new plan or blueprint that includes recycling as a major element
- monitor the implementation of the plan and the adherence to its goals and objectives
- have the ongoing task of investigating additional recycling activities, policies, and procedures
- decide how important it is that you also raise an income from the waste materials collected. This will influence decisions about how and who collect, pre-sort and deliver recyclable materials (see Step 6)



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Step 4: Conduct a waste identification study

A waste identification study identifies what types of materials comprise significant portions of your waste stream at certain key activity areas on your campus. It also identifies the origin of the materials, and provides the information needed to prioritise recycling and other waste reduction activities.

Some of this information can be gathered through the existing waste management staff records and also informally by walking through the campus and looking inside waste containers to ascertain what materials are being left in waste bins that service a particular area (e.g. you are likely to find paper in waste bins in an office environment and food waste in a canteen and beverage bottles and food packaging at sports facilities and social areas).

This is where the industry role players like **PETCO** can add value by supplying the relevant recyclables identification information.

Step 5: Set up a recycling infrastructure



Twin bin system

A recycling programme does not necessarily have to be operated by the facilities management or another administrative department of a campus. Unlike other facility services such as building maintenance, or landscaping, many aspects of recycling operations do not require skilled labour. In addition, recycling operations are more wide ranging in scope, encompassing everything from emptying paper recycling bins at workstations to preparing training workshops for staff, faculty members and students.

As part of the growing solid waste management sector, there is a substantial private service industry in place for recycling operations. You could appoint one of these suppliers as a one-stop shop, or work with various materials streams as part of your strategy. Whatever your waste reduction committee decides to do, keep in mind the following:

- Bins on campus must be marked to ensure separation of (mixed, dry, clean) recyclable materials from non-recyclables. A good idea is to use a **twin bin** format.
- However, while it may look attractive, it is **not advisable** to provide extra bins to accommodate the separation of various recycle streams unless such 'recycling stations' or 'recycling streets' are under permanent supervision and used correctly. Use those only in areas where such supervision is possible.
- Sufficient, enclosed, undercover and secure space is required to store any separated mixed recyclables until the minimum amount is reached for collection (ideally by a local collector who provides a "one-stop-shop" service for all recyclables so that they can all be collected in the same bin)



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- Your materials storage area(s) should be easily accessible to both the collector and possibly even people from the surrounding communities, should you have space and capacity for a supervised recyclable drop-off location on campus. Your university could therefore significantly boost its material collection volumes (and related revenues) while providing a very valuable public service at the same time.
- Consider health and safety issues, among others, the possible odour (of wet and/or dirty recyclables), effect of insects (in particular of bees), the possibility of creating a fire hazard and any other issues that pose a risk, especially in high traffic areas.
- Security – To prevent vandalism or illegal dumping, restrict access to your collection area after hours.
- You will need bulk bags in which to store recyclables for collection. Your collector should supply you with those as part of their service.
- Staff/volunteers. It is important to decide who will be responsible for emptying bins and supervising your storage areas. Even if you make use of a specialist outside collector (see below), you will still need people to perform some basic duties. Training cleaning staff to perform the specific recycling duties, or organising a team of volunteers are two of the options you could consider.
- Protective clothing – Ensure that all staff and volunteers, including cleaning staff who become involved in materials recovery and storage have the necessary protective clothing, e.g. gloves (in particular if you collect recyclables such as highly breakable glass bottles.)



Step 6: Collection and transportation

Space requirements

- Issues of space and temporary storage can become a problem if not included in the programme's detailed plan. Identify a suitable area where the recyclable materials may be stored during the collection phase (before being picked up or taken off site). Take PET plastic bottles as an example: since they are filled with air, they take up a large volume, even though their mass is relatively low. The same is true for some other recyclables such as beverage cans. If a method is available to squash the bottles and cans, it is advisable to do this, as this would save space and more could be collected for one load.
- The site should be secure and not be in the way of anyone. It should nevertheless also be easily accessible to the vehicles that transport the materials off site.
- Relevant health, safety and fire prevention standards should be considered and implemented.
- You can use bulk bags as containers to store materials and contain them in a format which often makes more economic transport possible. Talk to PETCO about bulk bags for PET beverage bottles.



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DID YOU KNOW ?

The simple act of flattening PET containers decreases collection costs by increasing the amount of materials collected or placed into containers at collection points. It has been estimated that by simply flattening PET bottles, truck collection volumes can be increased by as much as 50%.

Delivery or collection?

There are several ways to organise that recyclable materials reach the companies that will recycle the materials into new products. Each of the approaches has distinct benefits and costs. The main decision to make is if you will take it away yourself, or have it collected.

- Decide whether you are going to do detailed separation at source. For instance, there are many different types of paper (such as printer paper, newspapers, magazines, cardboard, and construction paper). The same is true of the different kinds of plastics, glass and metals. Should you separate each specific type, it could make your recyclables more valuable. Discuss this with the specific recycling organisations and collectors to ensure that you take the most suitable decision for your company.
- It may be necessary to choose different ways of disposal for different materials, depending on the nature and volumes of the specific waste materials that your business has to manage. Talk to PETCO about the most effective way of recycling PET beverage bottles, and read about the advantages of doing so later in this document.
- You could also collect/store all paper products in one bin, plastics in another, etc. This method is called commingled collection, and means less work - but materials could be contaminated easily when they are mingled together. Again, it is important to know how and where such commingled recyclables could be deposited or collected.
- Volumes are key to the decision about disposal and collection. PET plastic and many other materials need to be collected in large volumes in order to make it viable for the collector. Where large volumes of recyclables are not collected, you will be forced to arrange your own delivery.
- As part of the overall programme, you could donate some items to charities. Many charitable organisations will be prepared to take and even pick up recycled materials that may be found on campus, such as books, and electronics.
- Some campuses are located in municipalities with recycling services. You may be able to arrange that they regularly pick up and dispose of whatever materials you recycle.
- Municipal drop-off sites do not pay for recyclables, but if you collect significant volumes, you could contact a recycler close to you for rates and delivery/collection options. A current list of municipal drop-off sites is found on www.petco.co.za.
- If you want to maximize your recycling programme and become a local drop-off centre, you could advertise the service to local businesses: they could then deliver their PET plastic to you for recycling. Contact info@petco.co.za for advice in this regard.
- You could organise to undertake disposal at a drop-off centre. This means using your own campus vehicles or organising transport when sufficient volumes have been collected, or at regular intervals.

Collecting and delivering loose material directly to recyclers

For this option, you have to take into consideration the following:

- The availability on campus of suitable vehicles or the cost of renting such vehicles
- The cost of fuel and general wear and tear on your vehicles



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- The cost of the labour required from your side to prepare, pre-sort, baling and other activities prior to transporting recycled materials to the recyclers.

These costs must be compared to the benefit of any revenue that you receive for the material when your material is collected (and possibly even pre-sorted) on-site by an external service provider. You will then be paid prices for loose material. These prices are often significantly less than the price for baled material.

Step 7: Develop a plan for ongoing education, training and communication

It is important to follow up periodically and monitor the success of source reduction and material reuse programmes and reinforce educational and communication efforts where needed.

Effective education and communication are highly important factors in the success or failure of waste reduction programmes. Reaching the campus population effectively will determine the quantity and quality of materials recovered for recycling and the ability to implement successful source reduction initiatives. The overall support of the programme is also based on how well the campus population understands it.

Introducing meaningful and clever social, environmental and even financial motivation drives are powerful strategies to ensure the longevity of a recycling campaign and to secure maximum buy-in of all stakeholders. One example of an effective campaign was at a European university, where they managed significantly to reduce their waste stream of non-recyclable polystyrene cups all over the campus by introducing a washable, re-usable, lidded, university-branded, sturdy plastic coffee mug to both staff and students as an alternative.

As part of your efforts to minimise waste on the campus, the following is particularly important:

- Clear communication before and immediately after introducing your new recycling programme on campus
- Continued communication thereafter to ensure that new students and staff are informed and that messages about the importance of recycling and the campus recycling activities are reinforced.

Work with the communication department on campus in this regard. They control and use the methods of communication with staff and students and are in the best position to assist.

You will also find useful information material available from recycling bodies. Contact PETCO and visit our website at www.petco.co.za for information about PET recycling. Also see more detailed information under '*PETCO supports universities' recycling initiatives*' later in this fact sheet.

PETCO supports universities' recycling initiatives

The more recyclable waste that is diverted from landfill, the more recyclable material entities such as PETCO has to recycle. This contributes to the vision of a green economy in which the demand for virgin PET is decreased and one in which recycled PET (rPET) becomes a viable alternative packaging material as well as boosting the local markets for products with rPET content.



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PETCO has a solid track record of more than a decade in the recovery and recycling of PET, adopting a holistic approach that focuses on the entire recycled PET value chain. Its experience is in the design and implementation of systems to boost and sustain the collection and recycling of PET, accompanied by supporting interventions that address the challenges of unemployment and poor general awareness of the benefits of recycling. Based on its experience and success, PETCO is well positioned to support universities prepare and implement their waste minimisation measures.

PET recovery & recycling: infrastructural support

PETCO can assist in the provision of recycling infrastructure. It supports alternatives to landfill disposal such as collection, drop-off centres, material recovery facilities and buy-back centres to boost the collection and recycling of PET.

In partnership with local authorities, schools, Plastics|SA and NGOs, PETCO has established many plastic recovery stations around South Africa, and therefore has the experience and expertise to assist universities with the establishment of similar structures. PETCO can help link universities with collection networks and assist in sustaining the viable collection of PET in their areas.

PETCO services: education, training and awareness

PETCO has developed an extensive information, training and awareness programme consisting of the following:

Information and communication: Utilising an assortment of communication tools and platforms, PETCO promotes awareness of PET recycling and conservation of the environment. It does this both independently and in partnership with other organisations.

PETCO organises exhibitions and workshops that promote awareness of PET recycling; supplies branded clean-up bags to event organisers to support the recycling of PET at special events (including sport, cultural and other events on campuses). PETCO also advertises in and provides editorial material for popular media to raise awareness about PET recycling, and develops resource materials such as fact sheets, videos, presentations and digital media for download and general consumption (see the PETCO digital library at www.petco.co.za).

Clean-up campaigns and litter awareness: PETCO organises and supports clean up and litter awareness throughout South Africa. It works through Plastics|SA and with NGOs, local business, government agencies and municipalities to organise these campaigns in targeted areas.

Education and training: PETCO visits tertiary educational institutes, schools, communities and environmental organisations to create awareness around the proper handling of plastics and PET recycling. PETCO supports the establishment of recycling co-operatives and provides co-operative members with both entrepreneurial training and the technical expertise to recycle. Technical knowledge includes the sorting methods, basic business skills, pricing of recyclable PET, sustainability and waste management education.



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Recycling Tips

- Check that there is no PVC shrink-wrap label, as this means that the container not recyclable
- Do not flake the bottles
- PET trays and punnets are currently not being recycled on a large scale as not all of them are identifiable and many are made of mixed polymers or with additives, thus making recycling difficult. Check with your collector / recycler upfront.
- **Do not** rinse the bottle during collection, the bottle goes through a number of washes when being recycled and therefore rinsing beforehand is a waste of water.
- Keep the cap on the bottle as it can be recycled and turned into other products.

What is PET plastic?



PET is the short name for **Polyethylene Terephthalate**, the type of plastic labelled with the #1 polymer identification code (in a triangle) on or near the bottom of bottles and containers. It is recognisable as an imprint on containers (transparent, clear and/or tinted or any other solid colour). PET is mainly used for **beverage bottles** for (bottled water, carbonated soft drinks, milk, juice, sports and energy drinks), **bottles** for household, personal care and pharmaceutical products **jars, punnets, tubs and trays** for food items, as well as **sheet and film** for packaging.

In South Africa empty, thrown away PET bottles are collected, then flattened and bundled up into big blocks (baled) and delivered to the recycling plant where they are colour sorted, washed, chopped into smaller particles (granulated), re-washed, and extruded (melted down and then made into long thin strings of plastic). Those strings are then cut into small pieces (pellets), before those are then re-used (as recycled plastics) for making a number of items we enjoy every day including fiber filling for our pillows, sleeping bags and winter coats, carpets in cars, fleece shirts but most importantly as recycled PET containers.

Once recycled, from either pre-consumer (such as factory off-cuts) or post-consumer (household) material sources, it is called rPET or Recycled Polyethylene Terephthalate.

Why collect and recycle PET Plastics?

PET is technically 100% recyclable. It is lightweight and strong and can be transported efficiently and is superior compared to other packaging options with regard to its environmental footprint linked to energy demand in production and resulting Greenhouse Gas (GHG) Emissions.

When recycled PET can further greatly reduce fuel use, energy consumption and greenhouse gas emissions. PET recycling creates jobs by providing a source of income and helps to save the planet's virgin resources.

The PET that is removed from the waste stream results in less waste going to landfill sites and reduces the amount of natural resources needed to make certain products, thereby



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reducing the impact on the Earth and environment. Recycling of PET fits very well into the concept of the Circular Economy, and closed loop thinking which looks at a cradle-to-cradle approach and aims to design waste out of a system by ensuring that waste from one product or process becomes a resource for another. This reduces the need for additional resource use and eliminates waste from the outset.

DID YOU KNOW?

- 1 recycled plastic bottle saves enough energy to power a 60-watt incandescent light bulb for 3 hours.
- Five 2-liter recycled PET bottles produce enough fibrefill to make a winter jacket.
- The energy saved by recycling one plastic bottle will power a computer for 25minutes.
Recycling 10 tons of PET plastic saves as much greenhouse gas emissions as removing more than three cars from

Who is PETCO and how can we support you?

PETCO is the national industry body responsible for managing the PET industry's extended producer responsibility (EPR) in South Africa. Our mission is to grow the collection and recycling of PET bottles after consumer use. We have done this for a decade, and are funded by a voluntary recycling levy paid by industry. We invest all our funds in ensuring and encouraging visible recycling, through:

- Contracting and financing PET recyclers who collect bottles, process them into rPET in preparation for the manufacture of new products
- Consumer education and awareness (including schools and community groups)
- Training and joint venture projects (including those with municipalities)
- Equipment support and sponsorship (for collectors), and
- Providing guidance relating to design for recycling (for industry).

PETCO offers educational material such as posters, DVD's, and PET collection bags for events that detail the PET recycling process. You can also apply to hire banners to be returned after any specific collection or recycling school or community event.

Contact PETCO for further information

Call toll free:	0860 147 738 (0860 1 is PET)
Email:	info@petco.co.za
Twitter	PETCO_SA
Facebook:	PETPlasticRecyclingSA
Instagram:	PETCO_SA
Website:	www.petco.co.za

Useful contacts



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Visit www.petco.co.za for a list of collection points, drop off sites and buy-back centres.

You could also contact some other industry bodies for general assistance or information about other material streams. Here are some of them, but you could also visit PETCO's website to download a fact sheet with useful contacts:

- Institute of Waste Management www.iwmsa.co.za
- National Recycling Forum www.recycling.co.za
- Packaging SA www.packagingsa.co.za
- Recycle Paper ZA www.recyclepaper.co.za/
- Polyolefin Recycling Company (POLYCO) www.polyco.co.za
- Polystyrene Packaging Council (PSPC) www.polystyrenepackaging.co.za/
- ROSE Foundation www.rosefoundation.org.za
- SAVA www.savinyls.co.za
- Tetra Pak www.tetrapak.com/za
- The Glass Recycling Company www.glassrecyclingcompany.co.za
- Collect-a-Can www.collectacan.co.za



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