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1. Introduction

1.1 The purpose of this document

This document provides details on the scope and method adopted for the 2022–23 and 2023–24 iterations of the Australian plastics flows and fates (APFF) study. It is intended to provide readers with a guide on the processes across stakeholder consultation, data collection and collation, data analysis and data management.

In more detail, this document contains:

1. **Introduction.** Provides contextual information about the APFF generally, this method report, data limitations and assumptions, and the management of confidentiality considerations.
2. **Scope and definitions.** This section describes the scope and key definitions for the APFF. The definitional lists are provided for the polymer types, application areas and waste source streams that are in scope of the APFF's quantification of plastics consumption and recovery.
3. **Project method.** A fairly detailed outline of the method for the APFF project, covering:
 - a) Data sources – an overview of APFF data sources.
 - b) Stakeholder consultation – the method for delivering the primary data collection requirement for the APFF through national surveys of Australian plastics manufacturers, importers and reprocessors.
 - c) Determination of plastics consumption – the method for analysing primary and secondary data to generate the plastics consumption dataset, which covers local resin production, imported resin, imported plastics in finished and semi-finished goods, and scrap imports.
 - d) Determination of plastics end-of-life generation – the method for estimating plastics end-of-life generation through material flow analysis, which draws on plastics consumption and product/packaging lifespan estimates.
 - e) Determination of plastics recovery – the method for analysing primary and secondary data to generate the plastics recovery dataset, which covers recycle to local reprocessors and recycle to overseas reprocessors.
4. **References.** A list of references used in this method report. For a full list of references used in the APFF, please see the most recent Australian Plastics Flows and Fates report.
5. **Glossary.** A glossary of terms and abbreviations used in the APFF

1.2 Background

The APFF has been undertaken since 2000. It provides time-series data on plastics flows. Data is generally at the level of polymer types and applications. The most recent year of reporting is for the 2023–24 financial year.

The report provides a detailed picture of the consumption, end-of-life (EoL) generation and recovery of plastics in Australia.

The report supports the monitoring of outcomes and other plastics data requirements under the National Waste Policy Action Plan (Australian Government, 2019), and the phase-out of problematic and unnecessary single-use plastic packaging and products (SUPPPs).

The report also assists in tracking the impacts of the waste export bans on changes in local reprocessing and exports of unprocessed and processed scrap plastics.

In more detail, this time-series plastics flow data provides reliable and consistent year-on-year information:

- on the current state of consumption, use and end-of-life fates across a broad range of sectors, locations and polymer types
- to support National Waste and Resource Recovery Report (NWRRR) reporting, and indirectly support related reporting into international waste and recycling datasets
- on plastic recovery rates by application area for interested stakeholders
- on the import and export flows of plastics
- on the use and destination of recovered plastics
- to support the development and tracking of policies and programs to assist further improvement of plastics materials efficiency over whole of life.

1.3 Data limitations and assumptions

The APFF study achieves good response rates from reprocessors and has for many years. Generally, the coverage rate is >90% by number, including those that can be estimated. We estimate that the survey accounts for >95% of local reprocessing by weight each year, for at least the last decade.

Reprocessing losses that occur overseas are not estimated. However, with the introduction of the unprocessed scrap plastics export restrictions from 1 July 2021 and 1 July 2022, the export of unprocessed scrap plastics has significantly decreased over the last 5 years.

Plastics consumption at the state and territory level is estimated based on per capita allocations, as there is no other good quality data available to break down consumption by jurisdiction. As such, estimates for consumption are approximations only, and do not account for any variations in household, commercial or industrial across different jurisdictions.

Weight data should be interpreted as having a maximum of three significant figures. However, to obtain a balance between the proper statement of the accuracy of the data, while minimising any apparent summation discrepancies in data tables, weight data is generally rounded to the nearest 100 tonnes (i.e. more than three significant figures).

Percentage values are rounded to either two or three significant figures, depending on the accuracy of the contributing values.

1.4 Confidentiality

Reporting does not include any company or facility level specific data from survey responses. All survey data has generally been aggregated to the level of polymer type and application area.

2. Scope and definitions

This section describes the scope and key definitions for the APFF study.

2.1 Project scope

2.1.1 Definition of 'plastic'

The definition of a 'plastic' used for this study is:

A plastic material is any of a wide range of synthetic or semi-synthetic organic solids that are mouldable. Plastics are typically organic polymers of high molecular mass, but they often contain other substances (additives). A polymer is a chemical comprised of many repeating chemical units called monomers, covalently bonded together.

Plastics and plastic additives are usually synthetic, most commonly derived from petrochemicals, but can be either partially natural or fully natural (i.e. biobased).

The definition of plastics excludes natural polymers (e.g. cellulose or wool) for which the polymerisation process has occurred in nature, independent of any extraction or production process, or any other human intervention, and there has been no systematic chemical modification to the natural polymer.

2.1.2 Definitions of 'reprocessing', 'recovery' and 'recycling'

The definitions for 'reprocessing', 'recovery' and 'recycling' that are applied in this study are drawn from the *Australian standard for waste and resource recovery data and reporting* (Blue Environment, 2024), with some qualifications and clarifications as described below.

Reprocessing

Transformation of recovered materials to make raw materials for use in making new products or direct use. May include cleaning, fractionation, crushing, shredding, dissolution, composting or other transformative processes. May also be called 'secondary processing'.

To avoid double-counting of material flowing through the system through collection, sorting, reprocessing and remanufacturing, the focus of data gathering for this study is placed on the reprocessing stage of the plastics life cycle.

The applied definition of Australian based reprocessing is the off-site sourcing of waste plastics (including returned product, e.g. EPS waffle pod off-cuts from building sites) which are then converted into either a finished or semi-finished product, or into a chipped format (or similar) that is ready for remanufacturing.

In-house recovery/regrind, or the baling and compaction of plastics where further reprocessing is required (e.g. size reduction) before the recyclate can be used to manufacture a new product is not reported as reprocessing, to avoid double-counting plastics reprocessing at different points in the supply chain.

EPS (foam) compaction and extrusion is reported as reprocessing. This process is the compaction of EPS using a bale press (or similar), and then either baling the compressed EPS, or the heating and extrusion of the semi-liquid EPS. Downstream reprocessing losses of EPS following compaction and extrusion are typically minimal.

All local reprocessor reported data has been standardised to an 'out-the-gate' basis. This means that reprocessing losses (e.g. to landfill) associated with locally reprocessed scrap plastics are excluded from recovery estimates.

Reprocessing includes scrap plastics that are destined for both material recovery (recycling) and energy recovery.

Recovery

Activities that culminate in the reprocessing of wastes into products or secondary materials that are returned to productive use, including for energy. May include collection, sorting, reprocessing and/or energy recovery. For data reporting purposes, the quantity of waste allocated to the fate 'resource recovery' is the sum of the quantities allocated to waste reuse, recycling and energy recovery.

The term 'recovery' as used in this report is defined as the amount of material reprocessed (i.e. out-the-gate of reprocessors) or to export. It includes scrap plastics that have been converted ready for either material recovery (recycling) or combustion in energy recovery processes.

Plastic scrap that is collected and exported for reprocessing and use overseas is defined as recovered. The reprocessing losses that occur when exported unprocessed scrap plastics (e.g. exported bales of PET bottles as sorted by material recovery facilities) are reprocessed overseas, have not been estimated.

Recycling

Activities that culminate in the reprocessing of wastes into products or secondary materials that are returned to productive use (excluding for energy). May include collection, sorting and/or reprocessing. For data reporting purposes, the mass of material allocated to the fate 'recycling':

- *includes all materials received by a reprocessing facility that are processed to the point of being suitable for manufacturing or return to productive use, whether immediately used or stored for later sale or use*
- *includes weight losses to the atmosphere during the processing of wastes (for example, moisture, carbon dioxide from organics degradation)*
- *excludes residuals that are sent to landfill or otherwise disposed of*
- *excludes materials received at a recycling facility but not yet processed*
- *is reported as wet weight.*

The term 'recycling' as used in this report is defined as the amount of material reprocessed (i.e. out-the-gate of reprocessors) or to export. However, it excludes scrap plastics that have been converted ready for combustion in energy recovery processes. Recycling is a subset of recovery, that excludes plastics sent to energy recovery.

2.2 Key definitional lists

There are a number of key definitional lists for the project, which frame the data collection, analysis and outputs. These provided in detail below, as applied in the 2022–23 and 2023–24 iterations of the study.

2.2.1 Polymer types

The polymer types quantified in the study are summarised in the following table.

Table 1 Polymer types and plastic identification code (PIC)

PIC	Polymer type	Main applications
1	Polyethylene terephthalate (PET)	Rigid packaging and clothing.
2	High density polyethylene (PE-HD)	Rigid and flexible packaging applications, and many other significant applications as well.
3	Poly-vinyl chloride (PVC)	Piping and conduit into the built environment.
4	Low / linear low density polyethylene (PE-LD/LLD)	Many film applications, both packaging and non-packaging.
5	Polypropylene (PP)	Packaging, vehicles and many other significant applications as well.
6	Polystyrene (PS)	Packaging, built environment, electrical & electronic devices.
6	Expanded polystyrene (PS-E)	Packaging and the built environment.
7	Acrylonitrile butadiene styrene / styrene acrylonitrile / acrylonitrile styrene acrylate (ABS/SAN/ASA)	Vehicles and electrical & electronic devices.
7	Polyurethanes (PUR) and polyisocyanurates (PIR)	Vehicles, built environment and many other applications.
7	Polyamides (PA) (nylons)	Clothing, vehicles, built environment and many other applications.
7	Rubbers (7)	Vehicles (tyres), the built environment, industrial (e.g. conveyor belts), and many other applications.
7	Bioplastics	Flexible and rigid packaging, and agricultural film applications.
7	Other aggregated polymer types	Many applications. Clear and coloured films and sheet, engineered plastics. This group consists of various acrylics, acetals, polyethylene oxide, polyisobutylene and other polymers of propylene (other than PP), and polymers of styrene (other than PS, P-ES and ABS/SAN).
-	Unknown polymers	All applications.

2.2.2 Application areas and product types

The application area destinations (for consumption) and sources (for recovery/disposal) quantified in the APFF study are summarised in the following table.

Table 2 Application areas

Application area	Coverage
Agriculture	Agriculture, forestry and fishing related applications.
Apparel	Clothing, footwear, and accessories. Includes work and sports clothing, and excludes manchester and soft home furnishings. This application area was included from 2022–23, and was previously aggregated under 'Other application area'.
Built environment	Built environment (i.e. construction and demolition) related applications.
Electrical & electronic	Electrical and electronic product related applications.
Houseware, leisure & sports	Household and personal goods related applications. Houseware includes furniture, equipment, tools, and machines used in homes and gardens, but

Application area	Coverage
	excludes electrical & electronic equipment. Houseware also includes manchester and soft home furnishings, but excludes carpet. Leisure and sports include indoors or outdoors leisure apparatus, camping goods, toys, and sporting gear used or stored at home, such as nets, bats, and pool noodles. Sport clothing is excluded. This application area was included from 2022–23, and was previously aggregated under 'Other application area'.
Packaging – B2C	Business to consumer (B2C) or 'Consumer' packaging related applications.
Packaging – B2B	Business to business (B2B) or 'Commercial and industrial' packaging related applications.
Transport	Self-propelled vehicles, including those used in primary production and manufacturing. Mainly automotive and other transport related applications. This entry was labelled 'Automotive' in the APRS 2018–19 report.
Other application area	All other applications. Includes industrial and manufacturing equipment/machinery, consumables and other inputs. The separate 'Industrial' application area was discontinued from 2022–23.
Energy recovery	Energy production related applications. It is worth noting that 'Energy recovery' can only be a destination application for end-of-life plastics, it is not a destination application for new products, and so cannot be a source application for end-of-life products.
Unidentified applications	Unknown applications.

The other application areas can be:

- destination applications for new products
- source applications for end-of-life products
- destination applications for end-of-life recovered plastics.

Table 3 Major product types in each application area

The major product types within each application area are summarised in Table 3. The study does not currently quantify plastic packaging and product flows at this level.

Application area	Product types	Comments
Agriculture	Fence posts	Includes stakes and pickets.
	Films for agriculture	Includes silage wrap and films for suppressing weeds.
	Fishing nets, fishing floats	-
	Irrigation pipe	-
	Rope, cable, twine and filament	Includes crop netting.
	Other agricultural applications	-
	Unknown agricultural products	Includes unknown product groups for this application area.
Apparel	Apparel – clothing	Includes work and sports clothing, fashion and outdoor gloves worn for warmth. Excludes safety equipment that is worn on the body, e.g. personal flotation devices, safety gloves (both reusable and single-use) and helmets. Excludes face-masks (both reusable and single-use).
	Apparel – footwear	Includes work and sports footwear.
	Apparel – other	Apparel other than clothing and footwear. Includes eyewear and fashion accessories. Includes safety equipment that is worn on the body, for example personal flotation devices, safety gloves (both reusable and single-use) and helmets. Includes face-masks (both reusable and single-use).
	Apparel – unknown	Unknown textiles that may or may not be apparel related.

Application area	Product types	Comments
Built environment	Builders film	-
	Concrete and bitumen additives	-
	Fit-out	Includes interior materials such as panelling, partitions, benches, cupboards, sinks, and other fixtures made from plastics.
	Floor coverings – carpet	Includes textile based floor coverings, carpet underlay (typically made from polyurethane), and unfixed floor coverings (e.g. rugs).
	Floor coverings – other	Includes non-textile based floor coverings.
	Geotextiles	-
	Insulation	-
	Outdoor infrastructure	Includes bollards, kerbing, marine structures, wheel stops, noise abatement walls, garden bed edging and similar. Excludes outdoor furniture, which is included under 'Furniture'.
	Pipes and cables	-
	Signage	-
	Structural and envelope	Includes waffle pods, bar chairs and builders' shims. Includes any structural components or external materials such as cladding.
	Turf – artificial	Artificial turfs, generally for outdoor use and made from synthetic polymers.
	Water tanks	-
	Windows and doors	-
Other built environment	Includes paints and adhesives.	
Unknown built environment products	Includes unknown product groups for this application area.	
Electrical & electronic	Large household appliances	Includes stereo equipment.
	Lighting equipment	-
	Mobile phones	-
	Other large equipment	Includes lawn mowers.
	Other small equipment	Includes electrical cable that is not associated with specific product groups.
	Solar PV and battery storage	-
	Temperature exchange equipment	-
	TV and computing equipment	-
Unknown electrical & electronic products	Includes unknown product groups for this application area.	
Houseware, leisure & sports	Furniture	Includes outdoor furniture.
	Housewares	Includes small articles of household equipment, such as cooking utensils and tableware. Includes other non-electrical equipment, tools and machines used in a home, that are not specified in other product types.
	Leisure and sporting equipment	Includes camping equipment and tents. Excludes sport related apparel.
	Manchester and soft furnishings	Includes bedding, towels, table cloths, cushions, curtains and similar.
	Mattresses	-
	Personal care	Includes toothbrushes, dental floss and hair brushes.
	Rope, cable, twine and filament	Excludes use in agricultural or industrial applications.
	Toys – non-electrical	
	Other houseware, leisure or sports	Includes cleaning equipment such as mops and scrubbing brushes. Includes unknown product groups for this application area.
	Unknown houseware, leisure & sports products	Includes unknown product groups for this application area.
Packaging – B2C	Flexible packaging (B2C)	-

Application area	Product types	Comments
	Rigid packaging (B2C)	Includes packaging foams (e.g. EPS).
	Other packaging (B2C)	Includes unknown product groups for this application area.
Packaging – B2B	Flexible packaging (B2B)	-
	Rigid packaging (B2B)	Includes plastic pallets, IBCs, RPCs, milk crates, bread trays.
	Other packaging (B2B)	Includes unknown product groups for this application area.
Transport	Vehicle body	Includes all forms of transport related equipment. Includes engine components.
	Tyres – passenger	Passenger tyres, including those used on passenger vehicles, motorcycles and caravans, as well as trailers for domestic use
	Tyres – truck	Truck tyres, including those used on buses, light and heavy commercial vehicles, prime movers, trailers and semi-trailers, and fire fighting vehicles
	Tyres – OTR	Off-the-road (OTR) tyres, including those used on machinery or equipment used in areas such as agricultural, mining, construction and demolition.
	Tyres – other	For example, bicycle tyres.
	Other transport	-
	Unknown transport products	Includes unknown product groups for this application area.
Other application area	Absorbent hygiene products	Includes non-woven polypropylene wipes.
	Food and beverage	Excludes packaging. Includes edible plastics such as synthetic sausage casings.
	Industrial equipment	Includes the physical assets that a company uses in the production process to manufacture products and services. Includes manufacturing equipment and other fixed industrial and commercial equipment.
	Materials handling equipment	Includes mobile garbage bins and larger bins. Excludes pallets.
	Medical	Includes research and laboratory equipment. Excludes safety gloves (both reusable and single-use). Excludes face-masks (both reusable and single-use).
	Printing and writing	-
	Rope, cable, twine and filament	Excludes use in agricultural, houseware, leisure or sports related applications.
	Safety equipment	Excludes safety equipment that is worn on the body, for example personal flotation devices, safety gloves (both reusable and single-use) and helmets. Excludes face-masks (both reusable and single-use).
	All other applications	Includes products such as tarpaulins. Includes unknown product groups for this application area.
Energy recovery	Energy production	-
Unidentified applications	Unidentified products	-

2.2.3 Waste source streams

The waste source streams (or just 'source streams') quantified in the study are summarised in the following table.

Table 4 Waste source stream

Stream	Description
Construction and demolition waste (C&D)	Waste produced by building and demolition activities, including road and rail construction and maintenance and excavation of land associated with construction activities.
Commercial and industrial waste (C&I)	Waste produced by institutions and businesses; includes waste from schools, restaurants, offices, retail and wholesale businesses, and industries including manufacturing.
Municipal solid waste (MSW)	Waste produced primarily by households and council operations.

3. Project method

This section describes the APFF project method for 2022–23 and 2023–24, covering the data collection activities and stakeholder consultation, and the analytical approaches undertaken for the determination of plastic consumption, EoL generation and recovery.

3.1 Data sources

The following stakeholder groups were surveyed to obtain primary data on plastics consumption and recycling:

1. **Australian resin manufacturers** – Polymer types and quantities manufactured, local production quantities, export of locally produced resin, destination market sectors and market commentary.
2. **Resin importers** – Polymer types and quantities imported, destination market sectors, market commentary.
3. **Plastics reprocessors** – Polymer type and quantities reprocessed, source industries and application, source jurisdictions, destination market sectors, approved and current maximum capacity, market commentary.
4. **Plastics exporters** – Interpretation and verification of scrap plastics export data, market commentary.
5. **Single-use plastic packaging and products (SUPPPs) manufacturers, importers and brand-owners** – Product types and quantities placed onto market.

Stakeholders were identified through previous survey contacts, the project team’s industry knowledge, state government consultation (to assist in identifying new reprocessors), and industry sources.

Significant secondary (pre-existing) data sources included:

- Australian Customs import and export data.
- Tyres consumption and recovery data provided by Tyre Stewardship Australia.
- Certified compostable plastics consumption data provided by the Australasian Bioplastics Association.
- Mobile phone related plastics recovery data provided by the Australian Mobile Telecommunications Association (MobileMuster).
- Population data sourced from the Australian Bureau of Statistics.

3.2 Determination of plastic consumption

Plastics consumption is determined using the approach outlined in Table 5.

Additions to Domestic Consumption (+):

- Local resin production – Data from local resin manufacturers.
- Imported resin – Data from customs import records.
- Imported plastics in finished and semi-finished goods – Data from customs import data.
- Plastic recyclate back into local use – Information from local reprocessors.
- Scrap import – Customs import data.

Subtractions from Domestic Consumption (-):

- Export of locally produced resin – Based on customs export data and local resin manufacturers.
- Exported plastics in finished and semi-finished goods – Customs export data.

Result (=):

- Domestic consumption – The net result after adding and subtracting the above flows.

Table 5 Determination of plastics consumption and related information sources

±	Consumption flow	Primary information sources
+	Local resin production	Local resin manufacturers
+	Imported resin	Customs import data
+	Imported plastics in finished and semi-finished goods	Customs import data
+	Plastic recyclate back into local use	Local reprocessors
+	Scrap import	Customs import data
-	Export of locally produced resin	Customs export data / Local resin manufacturers
-	Exported plastics in finished and semi-finished goods	Customs export data
=	Domestic consumption	

3.3 Determination of plastics end-of-life generation

The lifespan of plastic products varies from short-term and single-use items to long-term durable products which may remain in use for many years before reaching end-of-life. This creates a challenge for estimating the recovery rates of plastic products with a lifespan of more than a couple of years, as consumption is not equivalent to the quantity of plastics reaching end-of-life and thus available for recovery.

This issue has been addressed through the application of a material flow analysis (MFA). MFA is an analytical method of quantifying flows and stocks of materials or substances in a well-defined system, in this case for plastics.

The MFA system developed for this project is a model of flows of all plastic products, built up from estimated flows of historical, current and future sales (consumption) and estimated lifespans, differentiated by application area and polymer type. The MFA model back-casts to the 1979–80 financial year, with time series estimates of the model outputs to 2049–50.

This reporting time period has been selected to provide both the required degree of back-casting for long-lived plastic products, and ‘business-as-usual’ based forward projections over a longer term planning horizon (i.e. over the next 20–30 years).

It is important to emphasise that forward projections become increasingly unreliable in the more distant future, and are inherently volatile to apparently small changes in adopted growth rates. For example, an estimated increase in average annual consumption of 3.7% will result in approximately 20% more consumption after 30 years, relative to an average annual consumption growth rate of 3.1%.

Projections of recovery are not modelled, as future actions to increase or decrease recovery are not sufficiently predictable.

Some of the key attributes of the underlying modelling are:

- Plastics consumption and recovery data across the period of 2014–15 to 2023–24 is based on the survey data collected for the APFF in each of these years.
- Plastic product lifespans (i.e. the period of use before reaching EoL) by application area are largely based on Geyer (2017, p. 10), with normal distributions adopted for lifespan estimates. Potentially more appropriate functions do exist for this type of lifespan or reliability modelling (e.g. Weibull distributions). However, insufficient empirical data is currently available with which to fit long-lived plastic product lifespans (e.g. greater than 10 years) to a potentially more ideal function.

It is also worth noting that only a quarter of plastics consumption in 2022–23 had an adopted average lifespan of greater than 10 years, so a relatively small proportion of plastics flows are potentially sensitive to the application of non-ideal lifespan distributions.

- Plastics consumption from 1980 to 2004 for all application areas are generally calculated using a 24-year compound annual growth rate (CAGR) estimate based on Geyer, et al. (2017) data.
- With some minor exceptions plastics consumption from 2004 to 2015–16 by polymer type and application area are based on a straight-line interpolation between the 2004 sales estimates (including imports of finished and semi-finished goods) and the available 2016–17 to 2018–19 data averages.
- With some minor exceptions plastics consumption from 2016–17 to 2023–24 by polymer type and application area are based on actual data drawn from previous iterations of this study and the current data year.
- Plastics consumption (and the dependent EoL generation estimates) from 2024–25 to 2059–60 by polymer type and application area are based on either a rolling 10-year CAGR trend (non-packaging flows) or industry reports of anticipated market growth over the next 5 years (packaging flows).

3.4 Determination of plastics recovery

Plastics recovery is determined by adding the recycling flows outlined in Table 6.

Table 6 Determination of plastics recovery and related information sources

±	Recycling flow	Primary information sources
+	Recyclate to local reprocessors (to local use)	Local reprocessors ¹
+	Recyclate to local reprocessors (to export)	Local reprocessors
+	Recyclate (unprocessed scrap) to overseas reprocessors	Customs export data
+	Tyres recovery	Tyre Stewardship Australia (TSA)
+	Plastics in e-waste recovery	NTCRS reporting / MobileMuster
=	Total recovery	

1. Included contact with a small number of composters nationally to seek information on the receipt of compostable plastics.

Domestic reprocessing figures are obtained from surveying individual Australian plastics reprocessing businesses. The survey covers the following areas:

1. company details
2. operational details
3. polymer types reprocessed
4. polymer sources
5. polymer destinations – by application area (one of which is energy recovery), and local/export destination)
6. overseas imports of scrap polymers
7. reprocessing of flexible plastics, textiles and reusable packaging
8. changes in stockpiles
9. reprocessing capacity
10. market feedback.

Export of recyclate (scrap plastic) is estimated from data provided by reprocessors and exporters, and review and analysis of the relevant Australian Customs export codes.

While there are a range of current technologies available for recovery, in Australia mechanical recycling is the main process used to recover plastic materials. This report also includes scrap plastics and tyres going to energy recovery, which is mostly burnt in cement kilns (both locally and overseas).

4. Alignment of the APFF with the Australian standard for WWR data and reporting

The *Australian standard for waste and resource recovery data and reporting* (Blue Environment, 2024) (the Standard) was developed on commission to the Australian Government and establishes a national standard for data and reporting on waste and resource recovery (WRR).

Provided here is a summary of the alignment of the APFF study with the Standard. It is noted that this study quantifies the consumption of plastics, but consumption is not covered under the Standard, which considers material flows data and reporting from the point of waste generation and downstream.

Table 7 Alignment of this report with the Standard

#	Standard section	Alignment comments
1.	Introduction	
1.1	Context	Aligned.
1.2	Role and target audience	The same role and target audience (plus the community).
1.3	Objectives of the Standard	Aligned.
1.4	About this document	Not applicable.
2.	Definitions	
Item 1	Definitions	Definitions are materially aligned, including with respect to key definitions such as 'Recycling', 'Recycling rate', 'Recovery', 'Recovery rate', and 'Waste generation' (labelled in APFF reporting as 'End-of-life generation').
3.	Scope	
Item 2	Geographical scope	Aligned.
Item 3	Temporal scope	Aligned.
Item 4	Fate scope	Largely aligned, with the exception of the 'waste reuse' fate in the Standard. In particular, the 'waste reuse' of synthetic plastics in clothing and tyres exported for retreading are allocated to recovery in this report, and the 'waste reuse' of plastics in products sold through reuse shops (e.g. charity outlets) is not quantified.
Item 5	Materials scope	Largely aligned. While it is included in the total flow quantifications this report does not separately report on plastics recovered through container deposit systems (CDS), and on plastics in household hazardous waste collections.
4.	Classifications for WRR data and reporting	
Item 6	Classification of source streams	Aligned.
Item 7	Primary classification for reporting	Aligned. APFF reporting also contains plastic polymer level reporting more detailed than that provided in the Standard. The Standard also proposes data collection at the level of 'waste products'. APFF reporting provides separate data on plastics in e-waste, but not for end-of-life vehicles, used lead-acid batteries (PP components), nappies, mattresses, carbon fibre goods and fibreglass goods.

#	Standard section	Alignment comments
Item 8	Classification of mixed material loads	Outside of the required scope for the APFF reporting.
Item 9	Reallocating product wastes and mixed loads to material classes	Outside of the required scope for the APFF reporting.
Item 10	Classification of destinations	Largely aligned, except that data on the destination of recovered plastics split between metro/regional (in the same state/territory) is not reported.
Item 11	Classification of productive uses	Largely aligned. However, recovered plastics to 'waste reuse' not quantified.
Item 12	Classification of infrastructure	Aligned.
5.	Government recording of cross-boundary flows	
Item 13	Inter-jurisdictional imports and exports	Aligned.
Item 14	International imports (states and territories)	Not aligned. Imports of scrap plastics from overseas are quantified in consumption estimates, but are not separately reported.
Item 15	International imports and exports (Australian Government)	Not aligned. Imports and exports of scrap plastics from overseas are quantified in consumption and recovery estimates, at a significantly greater level of detail than that required in the Standard, but are not separately reported.
Item 16	Waste flows spanning years	Aligned. Change in stockpiles data is collected as part of reprocessor surveys.
6.	Data tasks and processes	
Item 17	Defining and obtaining data from primary providers	Not aligned. The APFF study data collection is undertaken on a voluntary basis, not mandatory.
Item 18	Data to be collected by states and territories	Mostly aligned. However, data is not collected from plastics reprocessors at the level of each load of received material.
Item 19	Collection frequency and reporting timeliness	Not aligned. APFF data is collected annually, and not month or quarterly.
Item 20	Data collection mechanisms	Not aligned. Surveys are not automated, as this would likely undermine response rates and data quality.
Item 21	Data to be collected from local governments	Not applicable.
Item 22	Data to be collected by product stewardship organisations	Mostly aligned. While plastics recovery data is sought from relevant product stewardship organisations (i.e. NTCRS coregulatory arrangements and MobileMuster) and incorporated into the overall dataset, it is not separately published in APFF reporting.
Item 23	Energy recovery associated with landfill methane used for its energy value	Not applicable. Conventional plastics do not currently have a recognised degradable organic carbon fraction in landfill. In relation to compostable plastics – relatively trivial quantities are consumed in Australia (as of 2023–24) and so total related landfill methane emissions would be negligible if disposed to landfill.
Item 24	Current process for national waste reporting	Aligned. The APFF data has previously completed in time to support national waste reporting.

#	Standard section	Alignment comments
Item 25	Review schedule for this standard	Not applicable.
7.	Data management and reporting	
Item 26	Data units	Aligned. All data reported in tonnes.
Item 27	Data measurement	Aligned. Weighbridge data is reported by plastic reprocessors to the extent that is practicable and exists.
Item 28	Data validation	Aligned. All data is extensively reviewed, and year to year changes in survey responses are monitored and resolved on a case-by-case basis.
Item 29	Data gaps	Aligned. Data gaps are filled with estimates where possible. Recovery data accuracy is reported.
Item 30	Amendments to historical data	Aligned.
Item 31	Data quality and uncertainty	Partially aligned. Facilities numbers and gaps data is collected and reported at a high-level. Validation checks are undertaken and the estimated uncertainty for recovery estimates is provided in APFF reporting. Conservative weighbridge data accuracy of either $\pm 1.0\%$ or $\pm 2.0\%$ adopted for the APFF, instead of the $\pm 0.5\%$ recommended in the Standard. Audits are not undertaken as waste generation audits are not a needed (or possible) within the current APFF study scope, as waste generation is estimated using a material flow analysis based method.
Item 32	Metadata	Aligned.
Item 33	Data confidentiality	Not aligned. Plastics resin manufacturers and imports, and plastics reprocessors are surveyed on a confidential basis, to maximise response rates for voluntary surveys.
Item 34	Indicators and metrics	Largely aligned. The local recycling and recovery rates are not separately reported in this report, can readily be derived from data presented in this report.
Item 35	Colours for representing aspect of waste and resource recovery	Partially aligned. The main plastics flows graphic in the APFF report (most recent published report is for 2021–22) is aligned, but other figures are generally not aligned, and use historical colour selections in figures.

5. References

APCO (Australian Packaging Covenant Organisation) (2020) [Action Plan for Problematic and Unnecessary Single-Use Plastic Packaging](#)

Australian Government (2019) [National Waste Policy Action Plan 2019](#), prepared by the Australian Government, state and territory governments and the Australian Local Government Association

DCCEEW (Department of Climate Change, the Environment, Energy and Water) (2024a) [Australian Plastics Flows and Fates Study 2021–22](#), prepared by Blue Environment

DCCEEW (Department of Climate Change, the Environment, Energy and Water) (2024b) [Australian standard for waste and resource recovery data and reporting](#), 2nd edition, prepared by Blue Environment

Geyer, R., Jambeck, J. R. & Law, K. L. (2017) [Supplementary Materials for – Production, use, and fate of all plastics ever made](#)

TSA (Tyre Stewardship Australia) (2024) *Australian tyres data on the sales, end-of-life generation and recycling for the 2022–23 financial year*

6. Glossary

Term	Definition
ABS/SAN/ASA	Acrylonitrile butadiene styrene (ABS), styrene acrylonitrile (SAN), and /or acrylonitrile styrene acrylate (ASA) (PIC 7).
Application area	An application area is an aggregation of related product groups. Application areas tend to have more similar attributes in terms of manufacturing sources, composition, form (e.g. rigid components, film, fibre), location of EoL generation, and recovery considerations. In terms of quantifying plastics flows, the use of application areas assists in providing a practicable framework for tracking the lifecycle of plastic packaging and product flows into and out of use. An application area (e.g. packaging) can be used in many industrial and consumer sectors.
Biobased	Material that is composed in whole, or in significant part, of biological products or renewable agricultural and forestry resources such as plant starch from sugarcane or corn, cellulose, or plant/animal proteins.
Biodegradable	A generic term that indicates a polymer is biologically available for microbial decomposition, with typically no detail on breakdown products, time or extent of degradation or end environments. A certified compostable plastic (product or package) is biodegradable, however, a biodegradable polymer is not necessarily certified compostable.
Bioplastics	Plastics that are biobased, biodegradable or both. Bioplastics fall into three broad groupings, which are: biobased (but not biodegradable); biodegradable (but not biobased); or biobased and biodegradable. Conventional polymers (e.g. PET and HDPE) can also be fully or partially 'biobased'.
Biopolymer	Variable usages. Can be used with the same meaning as either bioplastic or biobased plastic.
Bio-PE	Biobased polyethylene.
Bio-PP	Biobased polypropylene.
Bio-PET	Biobased polyethylene terephthalate.
Biosolids	Solid, semi-solid or slurry material produced by the treatment of urban sewage or trade waste (liquid waste) generated by industry.
Built environment	The built environment application area largely refers to buildings (including both the structure and interior fit-out) and public infrastructure (e.g. roads). It covers both construction and demolition related activities.
Business-to-business (B2B) packaging	Packaging used for the containment, protection or handling of product where the end-customer, prior to the packaging reaching end-of-life, is a business or institution. Typically includes the secondary and tertiary packaging that is used to move products between businesses prior to sale to end-consumers, but can also include primary packaging if the business is the end-user. Same meaning as 'Commercial packaging'. Also see 'Packaging' and 'Business-to-consumer (B2C) packaging'.
Business-to-consumer (B2C) packaging	Packaging used for the containment, protection, marketing or handling of product where the end-customer, prior to the packaging reaching end-of-life, is a consumer (i.e. a person). Includes the primary packaging that is sold to end-consumer, and possibly some secondary packaging, but excludes any B2B packaging that is part of the packaging system. Same meaning as 'Consumer packaging'. Also see 'Packaging' and 'Business-to-business (B2B) packaging'.
Capacity (reprocessing)	The industrial capacity available to reprocess waste materials per year, overall or by polymer type. 'Current capacity' is the maximum quantity possible to be reprocessed at a facility per year. 'Spare capacity' is the unused or potential quantity of reprocessing ability at a facility per year, in excess of actual

Term	Definition
	reprocessed quantity. 'Planned capacity' is the quantity per year, beyond the current capacity, that the reprocessor has committed (funded) plans to install or develop.
Certified compostable	Means that claims of compliance with Australian Standard 4736-2006, compostable and biodegradable plastics – “Biodegradable plastics suitable for composting and other microbial treatment” and Australian Standard AS 5810-2010 Home Composting – “Biodegradable plastics suitable for home composting” have been verified.
Chemical (feedstock) recycling	The use of chemical processes such as hydrothermal liquefaction (HTL), gasification, pyrolysis and solvolysis to convert scrap plastics into a hydrocarbon gas or liquid that is usable as a fuel or as an input for manufacturing chemicals, including plastics. Also called advanced recycling or feedstock recycling.
Circular economy (CE)	A systems-level approach to economic development designed to benefit businesses, society, and the environment where products and materials are kept in circulation through processes such as recycling, repair, reuse and composting. A circular economy aims to decouple economic growth from the consumption of finite resources and build economic, natural, and social capital. The CE concept is built on and applies three key principles: <ul style="list-style-type: none"> • eliminate waste and pollution • keep products and material in use • regenerate natural systems.
Closed-loop recycling	Material from a product system is recycled in the same product system and is of the same quality and functionality as the original material. In terms of end-of-life fates, closed-loop recycling will typically provide greatest environmental benefits, with the key attribute being the displacement (competition with) virgin resource extraction. Closed-loop recycling of plastics is always considered to be virgin resin competing. Also see 'Open-loop recycling' and 'Downcycling'.
Commercial and Industrial (C&I)	Material used by or produced from all commercial and industry sources other than construction and demolition (C&D) related sources. This includes institutions and businesses, schools, restaurants, offices, retail and wholesale businesses, and industries including manufacturing. Also includes material into or from primary and secondary production, such as mining and minerals processing.
Compostable	In this report compostable is used as a specific term that describes a biodegradable bioplastic based article (usually packaging) that degrades and meets the requirements of the Australian Standards for commercial composting (AS 4736–2006) and/or home composting (AS 5810–2010), or meets similar overseas standards such as the European standard is EN 13432. To be called compostable, packaging must biologically decompose and disintegrate in a composting system (under either commercial or home composting conditions) to set levels within a defined period of time. The compost must also meet specific quality criteria relating to eco-toxicity and other characteristics.
Composting	Predominantly an aerobic biological process that turns organic material into compost, which can be a useful soil additive. This process diverts organic material from landfill and so prevents the production of methane (a powerful greenhouse gas).
Construction and Demolition (C&D)	Material from the construction, refurbishment and building demolition industries.
Consumption	Total use of product by Australian industry and consumers. Includes locally made and used product, imported product and locally utilised recyclate. Does not include locally made product that is exported for sale.

Term	Definition
Converter	Company which converts resin, either virgin resin or recycled content resin, into plastic products.
Degradable	A broad term applied to polymers or plastics that disintegrate by a number of processes, including physical disintegration, chemical degradation, and biodegradation by biological mechanisms. As a result of this definition, a polymer may be degradable but not biodegradable.
Destination	A geographical destination to export or local consumption and recovery. Also used to indicate market sector destination, which is commonly referred to as 'application area destination'. This is the intended use (consumption) for the virgin or recovered plastic after being formed into goods.
Disposal	The deposit of solid waste in a landfill or incinerator, excluding solid waste that is sent to energy recovery.
Diversion rate	Recovery (at a defined point) as a percentage of end-of-life disposal. Also see 'Recovery rate' and 'Recycling rate'.
Domestic	Material from domestic (household) sources.
Downcycling	Recycled material is of lower quality and functionality than the original material(s). Materials are recycled into different applications with less stringent performance specifications, and where the recycled materials are typically substituting for (competing with) materials other than the original high quality virgin materials. Examples of this include the recycling of mixed polymer rigid plastics, e.g. a mixture of HDPE, low-density polyethylene (LDPE) and polypropylene (PP) into timber substitute products (e.g. outdoor furniture, pallets, and fencing), where the recovered plastics are competing primarily with timber as the alternative material. Down-cycled materials are potentially more difficult to recycle at end-of-life (although they often have long functional lifespans) and are more likely to be disposed to landfill at end-of-life. Also see 'Closed-loop recycling' and 'Open-loop recycling'.
End-of-life (EoL) generation or arisings	The term for when a product or material reaches the end of its intended purpose (life cycle) and is disposed to waste streams. EoL generation has the same meaning as 'waste generation' and 'EoL arisings'
Energy recovery	Combustion of waste plastics as either a fuel substitute (e.g. in cement kilns), or in specialised waste combustion facilities to create heat, which is then generally used for steam production. The steam is then used directly in industrial processes and/or used to generate electricity. Excludes incineration where a substantial portion of energy value in the waste plastic is not recovered.
Equivalent passenger units (EPUs)	A standard tyre measure, based on the typical weight of a standard new passenger tyre (9.5 kgs) and used tyre at disposal (8.0 kg).
Export for reprocessing	Material sent for reprocessing overseas.
Feedstock recycling	Same meaning as 'Chemical recycling'
Flexible plastics	Soft (flexible) plastics are generally defined as plastics that can be scrunched into a ball, unlike 'rigid' plastics such as bottles and tubs, which are moulded and hold their shape. Also refer to the 'Rigid packaging' entry.
Household	Material from domestic (household) sources.
In-the-gate	Material entering a facility for reprocessing. This may include material that is unusable due to contamination. In-the-gate material that is subsequently sent to landfill is generally either a combination of gross contamination (i.e., materials that should not have been presented and are not recyclable at the receiving facility) and/or designated scrap plastics that were not recovered into product due to cross contamination with unrecyclable materials or losses due to other types of production inefficiencies (e.g. losses to trade waste). Also see 'Out-the-gate'.
Internal use	Recyclate processed and used within the one company.

Term	Definition
Local/Locally	In Australia.
Local reprocessing	Scrap plastics reprocessed in Australia. As an example, locally reprocessed scrap plastics recovered from WA are generally reprocessed in WA but may also be reprocessed at interstate facilities. Both WA and interstate reprocessing facilities are defined as local facilities.
Local use	Recyclate used within Australia by an Australian company in the manufacture of a new product.
Material flow analysis	Material flow analysis (MFA) is a mass balanced based analytical method to quantify flows and stocks of materials or substances for a well-defined system and time period. MFA is also referred to as substance flow analysis (SFA).
Mechanical recycling	The use of physical processes such as sorting, chipping, grinding, washing and extruding to convert scrap plastics to a usable input for the manufacture of new products.
MRF	Material Recovery Facility – a facility for the sorting of recyclables (typically packaging) into various product streams.
Municipal solid waste (MSW)	Household material plus material from public place recycling and other council services.
NTCRS	National Television and Computer Recycling Scheme.
Non-packaging / durable	Long-term use item; not designed to be single-use or disposable within a 12-month period.
Off-the-road (OTR) tyre	Tyres for mining sites and heavy industry applications, including tyres from tractors and earthmoving vehicles.
Open-loop recycling	Material from a product system is recycled into a different product system and may be of lower quality and functionality than the original material. Importantly, the recycled materials substitute for, and avoid the use of virgin materials in the new applications. Examples of this include the recycling of PET bottles into fibre for use in clothing and other textiles, and high-density polyethylene (HDPE) milk bottles into mobile garbage bins and milk crates. Open-loop recycling can be as environmentally beneficial as closed-loop recycling, particularly if the use competes with virgin resin. However, open-loop recycling can also be less environmentally beneficial than closed-loop recycling, particularly where used in applications that are not virgin resin competing. Also see 'Closed-loop recycling' and 'Downcycling'.
Out-the-gate	Material leaving a facility following reprocessing and excludes most contamination. Also see 'In-the-gate'.
Oxo-degradable or photo-degradable	Conventional fossil-based polymers (usually polyethylene or polypropylene) that have additives (sometimes called 'prodegradants') incorporated into the polymer at low rates (2-3%) to provide highly accelerated fragmentation of the plastic in sunlight or in the presence of oxygen or in an anaerobic environment.
Packaging	Material used for the containment, protection, marketing, or handling of product. Includes primary, secondary and tertiary/freight packaging in both consumer and industrial packaging applications.
PA (polyamides or nylons)	Polyamides (PIC 7). Typically referred to as 'nylon'.
PE-HD or HDPE	High density polyethylene (PIC 2). Typically referred to as HDPE.
PE-LD/LLD or LDPE/LLDPE	Both low density polyethylene and linear low density polyethylene (PIC 4). Typically referred to as LDPE and/or LLDPE.
PET	Polyethylene terephthalate (PIC 1).
PLA polyester	Poly-lactic acid (PLA)
Plastic	A plastic material is any of a wide range of synthetic or semi-synthetic organic solids that are mouldable. Plastics are typically organic polymers of high molecular mass, but they often contain other substances (additives). They are

Term	Definition
	usually synthetic, most commonly derived from petrochemicals, but many are either partially natural or fully natural (i.e. biobased). The definition of plastics excludes natural polymers (e.g. cellulose or wool) for which the polymerisation process has occurred in nature, independent of any extraction or production process, or any other human intervention, and there has been no systematic chemical modification to the natural polymer.
Plastics identification code (PIC)	A voluntary coding system for plastic polymers using the numbers 1–7. The PIC is used to identify the polymer composition of plastic products, potentially facilitating the post-consumer waste management of plastic goods. Also known overseas as the Resin Identification Code (RIC).
Polymer type	A polymer is a chemical comprised of many repeating chemical units called monomers, usually covalently bonded together. The polymer type is primarily determined based on constituent monomers. It can also be further framed by polymer structural aspects (e.g. the degree of side-chain branching from the main polymer backbone chain).
Polyolefin	A polyolefin is a type of polymer produced from an alkene monomer (general formula C_nH_{2n}). Polyethylenes (HDPE and LDPE) and polypropylene are polyolefins.
PU or PUR	Polyurethane (PIC 7).
Post-consumer domestic	Used material from household sources. Mostly packaging material from kerbside recycling collections.
Post-consumer industrial	Used material from non-household sources.
PP	Polypropylene (PIC 5).
Pre-consumer industrial	Scrap off-cuts and off-specification items in the manufacturing industry which are not used by the consumer and which are collected for reprocessing at a different site. Does not include material that is recycled directly back into manufacturing processes at the same site. Does not include material that has reached the end consumer, whether domestic or industrial.
Problematic plastic packaging	The definition for Problematic and Unnecessary Single-use plastic packaging is packaging that is (APCO, 2020, p. 5): <ul style="list-style-type: none"> • Difficult to collect/recover for reuse, recycling or composting purposes; or • A material that hinders, disrupts or obstructs opportunities to recover other materials or resources; or • A significant contributor to the plastic litter and marine debris problem; or • Manufactured with, contains or has contained hazardous chemicals or materials that pose a significant risk to human health or the environment. Certain types of packaging may not be considered problematic should emerging technologies result in effective collection/recovery for reuse, recycling or composting purposes, provided it can be removed from the environment.
Process engineered fuel (PEF)	PEF is a name for solid fuel of a specified size profile and energy content manufactured from high-energy content end-of-life materials, such as timber from building demolition, and scrap plastics from pre-consumer and post-consumer sources. PEF is burnt to generate heat for energy generation and is typically used in cement kilns to reduce coal and gas use.
Product group	Product groups are groupings of specific product types (e.g. a dishwasher) into more aggregated product groups (e.g. large household appliances). Product groups can then be rolled up into 'Application areas'.
PS	Polystyrene (PIC 6).
PS-E or EPS	Expanded polystyrene (PIC 6). Typically referred to as EPS.
PVC	Polyvinyl chloride (PIC 3).

Term	Definition
Recover / recovery / resource recovery	<p>In a general sense the term 'recovery' covers activities through which wastes are collected, sorted, processed (including through composting), and/or converted into raw materials for use in a production system.</p> <p>The term 'recovery' as used in this report is defined as the amount of material reprocessed (i.e. out-the-gate of reprocessors) or to export. It includes scrap plastics that have been converted ready for either material recovery (recycling) or combustion in energy recovery processes.</p>
Recovery rate	<p>Recovery (at a defined point) as a percentage of end-of-life disposal. Similar meaning to 'Recycling rate' but can include material into composting and energy recovery. Excludes reused products, and contaminants and residual wastes sent to landfill. Also see 'Diversion rate' and 'Recycling rate'.</p>
Recyclable packaging	<p>A packaging (1) or packaging component (2,3) is recyclable if its successful post-consumer (4) collection, sorting, and recycling is proven to work in practice and at scale.</p> <p>Also see the related 'Compostable packaging' and 'Reusable packaging' definitions.</p> <p>Supporting notes:</p> <ol style="list-style-type: none"> 1. A package can be considered recyclable if its main packaging components, are recyclable according to the above definition, and if the remaining minor components are compatible with the recycling process and do not hinder the recyclability of the main components. The Packaging Recyclability Evaluation Portal (PREP) is an online platform used to verify if packaging is recyclable via Australian and New Zealand kerbside collections. 2. A packaging component is a part of packaging that can be separated by hand or by using simple physical means (ISO 18601), e.g. a cap, a lid and (non in-mould) labels. 3. A packaging component can only be considered recyclable if that entire component, excluding minor incidental constituents (5), is recyclable according to the definition above. If just one material of a multi-material component is recyclable, one can only claim recyclability of that material, not of the component as a whole (in line with ISO 14021). 4. ISO 14021 defines post-consumer material as material generated by households or by commercial, industrial, and institutional facilities in their role as end users of the product which can no longer be used for its intended purpose. This includes returns of material from the distribution chain. It excludes pre-consumer material (e.g. production scrap). 5. ISO 18601:2013: A packaging constituent is a part from which packaging or its components are made, and which cannot be separated by hand or by using simple physical means (e.g. a layer of a multi-layered pack or an in-mould label).
Recyclate	<p>Recyclate is any recovered scrap material from both pre-consumer and post-consumer sources, either before or after reprocessing. It includes scrap plastics (before reprocessing), pellets, fines, and flakes (after reprocessing), but excludes material sent to energy recovery. Also see 'Scrap plastics'.</p>
Recycling	<p>Activities in which solid wastes are collected, sorted, processed (including through composting), and converted into raw materials to be used in the production of new products (the amount of solid waste recycled is net of any residuals disposed). Excludes energy recovery and stockpiles.</p> <p>In a general sense the term 'recycling' covers activities through which wastes are collected, sorted, reprocessed (including through composting), and/or converted into raw materials for use in a production system, excluding for energy.</p> <p>The term 'recycling' as used in this report is defined as the amount of material reprocessed (i.e. out-the-gate of reprocessors) or to export. However, it excludes scrap plastics that have been converted ready for combustion in energy</p>

Term	Definition
	recovery processes. Recycling is a subset of recovery, that excludes plastics sent to energy recovery.
Recycling rate	Recycling (at a defined point) as a percentage of end-of-life disposal. Similar meaning to 'Recovery rate' but excludes material into energy recovery, and reused products. Also see 'Diversion rate' and 'Recovery rate'.
Reprocess / reprocessing	Processing of recovered materials to make raw materials for use in making new products or direct use.
Reprocessing capacity gap	The difference between the theoretical maximum reprocessing capacity and end-of-life generation. It is important to note that reprocessing capacity estimates should be interpreted with care as they do not provide information on the availability of scrap plastics compatible with the spare reprocessing capacity, on operational constraints (e.g. availability of trained staff to operate spare capacity), or on the level of reprocessing value-add that can be undertaken with any spare capacity, and so the ability to find an end-market.
Reprocessor / reprocessing facility / reprocessing infrastructure	Facility that uses an industrial process to change the physical structure and properties of a waste material so it can be used again. This can include facilities that dismantle products, such as tyres, e-waste and mattresses, and energy from waste facilities that use materials to generate energy.
Resin	Raw polymer material.
Rigid packaging	Rigid plastic packaging such as bottles and tubs, which are (generally) moulded and hold their shape. Also refer to the 'Flexible packaging' entry.
Rubber – natural	A group of biobased polyisoprenes primarily made from latex harvested from the rubber tree. Typically made into products containing other additives, for example tyres with a partial or fully natural rubber component may also contain steel wire, plastic fibres and fabrics (typically nylon or polyester based), carbon black, silica, zinc oxide, sulfur and other additives.
Rubber – synthetic	A broad group of petrochemical based elastomers such as styrene-butadiene rubbers (SBR). Typically made into products containing other additives, for example tyres with a partial or fully synthetic rubber component may also contain steel wire, plastic fibres and fabrics (typically nylon or polyester based), carbon black, silica, zinc oxide, sulfur and other additives.
Scrap plastics	Used plastic material (including used tyres), either pre-consumer or post-consumer, that has been recovered for reprocessing, but has not yet been reprocessed.
Secondary processing	A process undertaken after sorting in which a recovered material is put through an industrial process to change it so that it can be used as an input for the manufacture of new products. Also see 'Reprocessor'.
Single-use plastic packaging and products (SUPPPs)	Single-use plastic packaging and products are intended to be discarded after first use.
Solid recovered fuel (SRF)	A fuel derived from solid waste produced to meet a specification. Term established by the EU via CEN/TC343 standard. In Australia, the commonly used term of 'processed engineered fuel' (PEF) has the same meaning.
Sorting / primary sorting	A process typically between collection and reprocessing in which collected end-of-life materials are sorted (or disassembled) into more usable and economically valuable material fractions. Secondary sorting can also be undertaken on some material flows. Material recovery facilities (MRFs) are (primary) sorting facilities.
Unknown polymers	Unknown polymers are plastics flows for which the polymer type cannot be identified. For example, plastic imports for which the quantity and application are identified, however, the polymer type cannot be determined either directly or through supporting investigations.

Term	Definition
Virgin material	Material that has been sourced through primary resource extraction. Virgin materials are often referred to as primary materials. Virgin materials are not sourced from recycled materials (sometimes called secondary materials).
Waste	Any discarded, rejected, unwanted, surplus or abandoned matter, including where intended for recycling, reprocessing, recovery, purification or sale. Anything that is no longer valued by its owner for use or sale and which is, or will be, discarded.
Waste plastics export	Export of (typically baled) scrap plastics material sent off-shore for reprocessing.
XPS	Extruded polystyrene (PIC 6).