

## Regional summaries

This section provides more detail on the waste generation and infrastructure needs of each region in Western Australia. Each summary includes a snapshot of the region's industries, demographics and economy, painting a picture of how the region's activities have influenced waste generation in 2020. The 2020 waste generation and demographic data is then used to estimate 2030 waste generation.

The 2020 resource recovery infrastructure capacity is based on licensed capacity which was obtained through the *State Waste Infrastructure Register*. Gaps in existing infrastructure capacity are identified when comparing 2020 infrastructure capacity and 2030 waste generation data. Projections of needed waste infrastructure are developed using the methodology described in previous sections. Existing and planned infrastructure by region is compared to projected waste volumes to determine need, based on the concept of critical mass presented in this plan and the need for expansion of existing or development of new facilities.

Each regional summary includes waste generation by source, including MSW, C&D and C&I, to provide more insight and guide decision-making at the regional level. Each regional summary includes:

- an assessment of the social, economic and environmental indicators of the region
- a summary of waste generation, treatment and movements in 2020
- a summary of waste generation and treatment in 2030
- infrastructure capacity needs in 2030, including assessment of opportunities to provide or access capacity in neighbouring regions
- breakdown of the waste by facility type and source (MSW, C&I or C&D) in 2030
- breakdown of the material generation and recovery in 2030
- analysis of landfills by type and identified capacity risk
- an assessment of the principles and priorities for the region.

A desktop assessment of facilities' licences has been employed to understand infrastructure capacity and, as such, may not accurately reflect the specific activities conducted on site. This is one of the key limitations of with the *State Waste Infrastructure Needs Analysis* methodology for assessment, particularly in relation to FOGO recovery facility capacity needs and organics recovery facility capacity needs.

The infrastructure plan focuses on identifying infrastructure needs in alignment with meeting the waste strategy targets. Targets specifically relating to FOGO are currently limited to the Perth and Peel regions. In regions outside of Perth and Peel, FOGO waste is collectively categorised as 'organics'. Stakeholder feedback highlighted this gap in the 2030 needs assessment as several major regional centre municipalities, such as the South West and Great Southern, are considering or implementing FOGO recovery as a means to achieve their MSW recovery targets.

While there appears to be sufficient licensed capacity for organics recovery to meet regional demands until 2030, the specific availability of FOGO recovery capacity remains uncertain. In addition, there is potential for barriers to arise in regions outside of Perth and Peel depending on regional approaches on kerbside FOGO recovery. Some facilities, despite being licensed for FOGO waste, either do not accept it or handle quantities below their licensed capacity. This is discussed in more detail in the Considerations and limitations section.

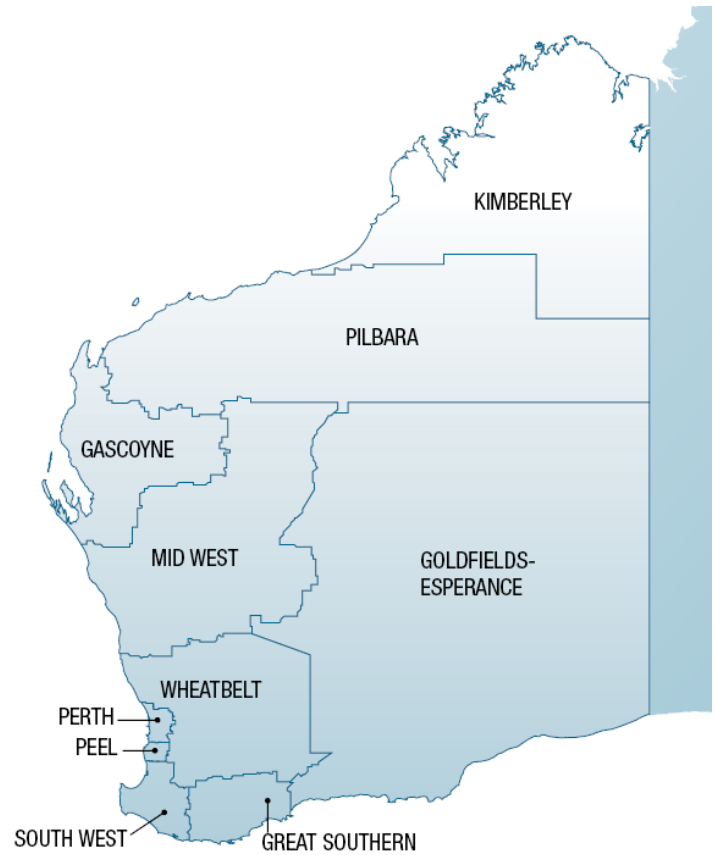
Further, more detailed exploration of FOGO capacity needs outside Perth and Peel is required as an area of future work.

The infrastructure plan includes a summary for each region outlined in Figure 22:

- Perth
- Peel
- Pilbara
- Kimberley
- South West
- Great Southern
- Mid West
- Gascoyne
- Wheatbelt
- Goldfields-Esperance.

Major regional centres as defined by the waste strategy are also included in assessments:

- Albany (Great Southern region)
- Bunbury (South West region)
- Busselton (South West region)
- Greater Geraldton (Mid West region)
- Kalgoorlie-Boulder (Goldfields-Esperance region).



**Figure 22 Regions used for the infrastructure plan**

## Peel region

### Waste profile in 2020

The Peel region is bordered by Perth to the north and is closely related in infrastructure capacity sharing. The region generated 287,000 tonnes of waste in 2020, consisting of about 52 per cent C&D waste, 29 per cent C&I waste, and 19 per cent MSW. The region treated 143,000 tonnes in 2020 with 71,000 tonnes (50 per cent) being recovered and 72,000 (50 per cent) being landfilled. The rate of material received into (87,000 tonnes) and transported out of the region (231,000 tonnes) in 2020 was about equal to the region's generation rate. Key waste profile data for the Peel waste and resource recovery in 2020 is presented below.

#### Residents in Peel

4 per cent of Western Australia's population resides in the Peel region.

Population density of 17 people per km<sup>2</sup>.

The majority of the Peel population (65 per cent) resides in Mandurah and surrounds, with low-density communities elsewhere.

#### Local governments in the region

Shire of Serpentine-Jarrahdale, Shire of Boddington, City of Mandurah, Shire of Murray, and Shire of Waroona.

#### Generating waste

Peel generates 5 per cent of the waste generated in Western Australia.

#### Transporting waste

The region has good road and rail infrastructure, especially in connection to Perth.

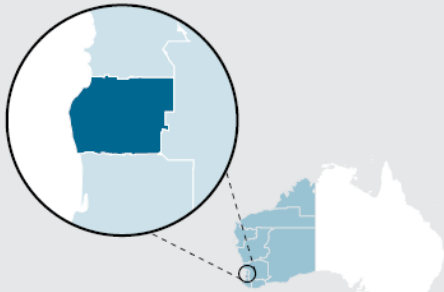
#### Treating waste

Peel treats 3 per cent of the the waste treated in Western Australia.

Peel recovers 2 per cent of the waste recovered in Western Australia.

Peel landfills 3 per cent of the waste landfilled in Western Australia.

# PEEL REGIONAL SUMMARY

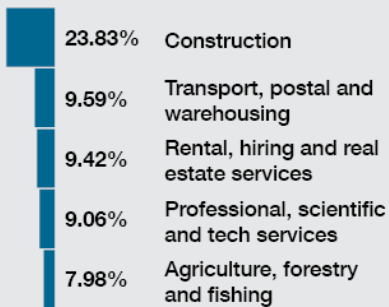


**AREA**  
6,648 km<sup>2</sup>

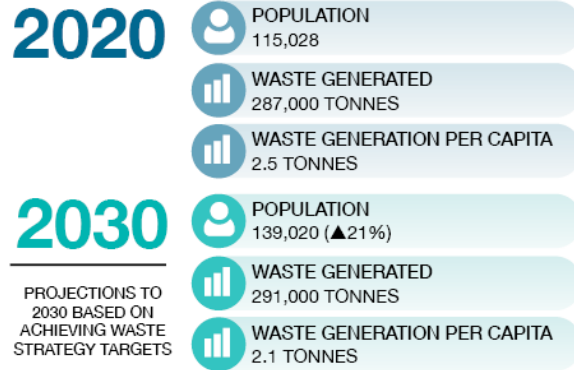
**GROSS REGIONAL PRODUCT (2019-20)**  
\$7.85B/CAP

**NUMBER OF BUSINESSES (2019-20)**  
7,783

## TOP 5 EMPLOYMENT BY INDUSTRY



The manufacturing industry sector makes the greatest contribution to economic output in the region, which at \$7.4B accounts for 31.74% of total output. With 5,675 jobs representing 12.79% of total employment, it is the retail trade industry sector that is the region's largest employer.



PROJECTIONS TO 2030 BASED ON ACHIEVING WASTE STRATEGY TARGETS

### 2030 INFRASTRUCTURE CAPACITY NEED

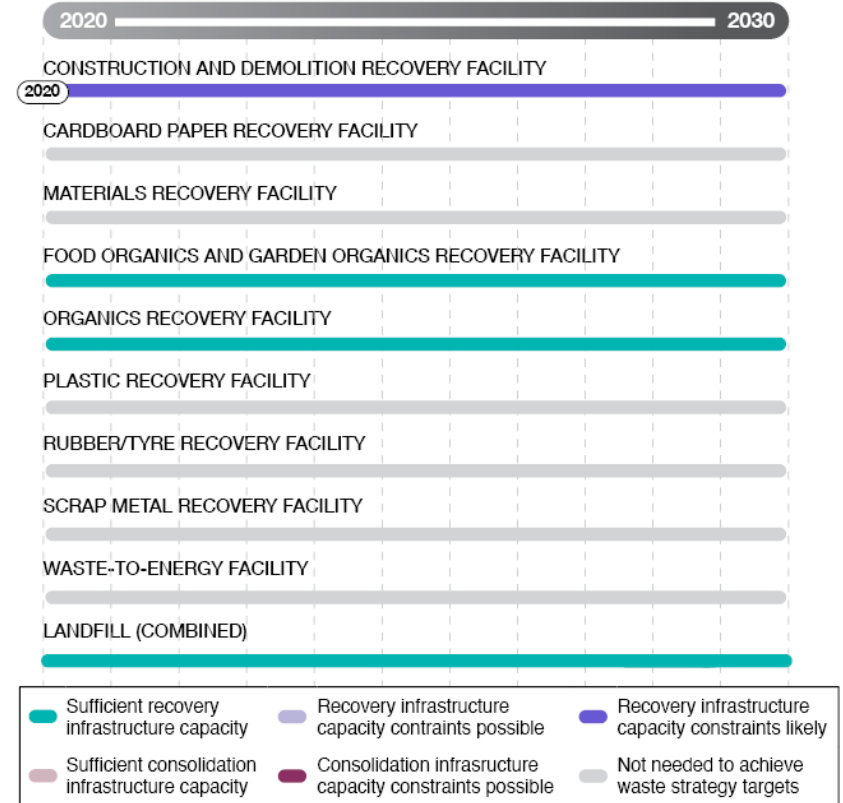
1. Construction and demolition | 51,500 tonnes

### TOP PRIORITIES

1. Review options to facilitate lifetime and capacity expansion of existing construction and demolition facilities in Peel.
2. Assess whether existing 67A licensed facilities in Peel or neighbouring regions can be increasingly utilised to alleviate food organics and garden organics recovery capacity need.
3. Monitor progress for implementation of capacity expected from the Food Waste for Healthy Soils program.

## INFRASTRUCTURE NEED BETWEEN 2020 AND 2030

Projections for capacity constraints compare current, approved and planned capacity against the infrastructure needs by 2030 to meet the waste strategy targets.



## WASTE IN PEEL 2020 AND 2030

Waste projections to 2030 based on meeting the waste strategy targets

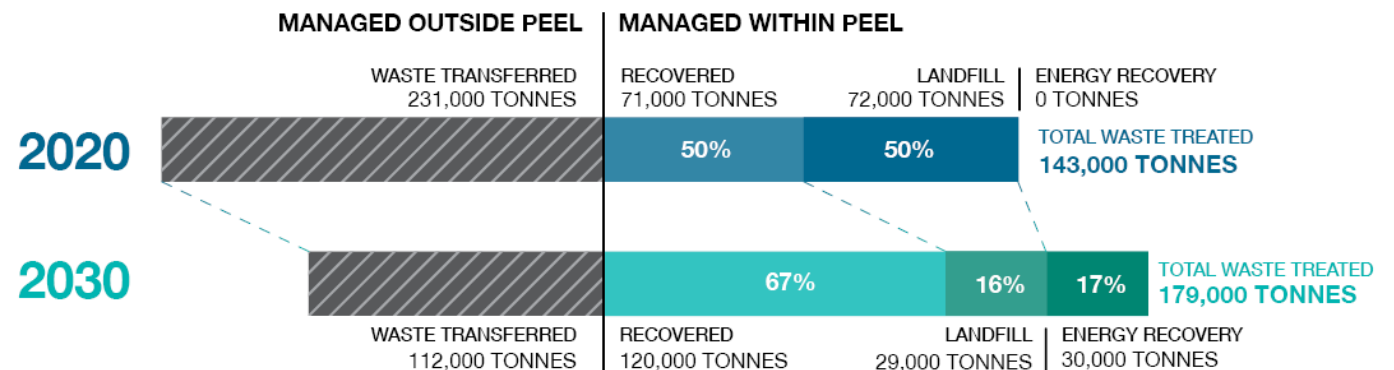


Figure 31 Waste in Peel: statistics and projections

## Waste and resource recovery in 2020

Peel is the second most-densely populated region in Western Australia after Perth and is reliant on neighbouring regions for a significant portion of its waste management needs. Mixed C&D waste represented the top material generated, treated, received and transferred from the region. This indicates that capacity sharing within and outside of Peel is key for C&D recovery. The top five materials processed in the region in 2020 include:

1. mixed C&D waste
2. mixed putrescible waste – domestic (household)
3. sand/soil
4. mixed putrescible waste (C&I)
5. metals – ferrous steel – non-packaging.

More than half of the material treated in Peel was through the region's three C&D recovery facilities (with a fourth facility currently in planning). There is also considerable organics processing capacity through the region's three organics recovery facilities. There are no other recovery facilities in the region. Remaining material is disposed of through the region's one putrescible landfill and three inert landfills.

The region's location and good transport infrastructure means that Peel will continue to share processing capacity and constraints with neighbouring regions. Perth was the dominant partner in trans-regional material movements, followed by the South West, although waste imports extended as far as the Pilbara and Goldfields-Esperance regions. Peel is particularly critical in the disposal of asbestos (25 per cent of material imports). Connection with other regions also facilitates a range of market offtake options for C&D and organics recovered in Peel.

Key aspects of waste and resource recovery system in the Peel region in 2020, considered by the infrastructure plan, include:

- Mixed C&D was the largest type of material generated, received into and transferred out from the region.
- Mixed putrescible waste (domestic and commercial) also forms a large portion (28 per cent) of the waste transferred out from Peel.
- Peel plays a critical role in treating asbestos generated in other regions.
- The development and operation of local waste-to-energy facilities (likely in Perth) will have a significant impact on the treatment method of material generated in Peel.

The location of current and planned recovery infrastructure in Peel in 2030 is shown in Figure 34 (see Facility lists in the Appendix for a full list of facilities). Facilities granted work approvals since 2020 by the department in the Peel region are listed below in Table 25 Facilities granted licences or works approvals since 2020 in PeelTable 25. These facilities have not been included in the modelling for the infrastructure plan and may alleviate some of the region's capacity needs.

**Table 25 Facilities granted licences or works approvals since 2020 in Peel**

Facility type	Facility name	Location
Consolidation centre and landfill (Category 63)	Peel Landfill Facility	Peel

WASTE FLOWS 2020

# PEEL

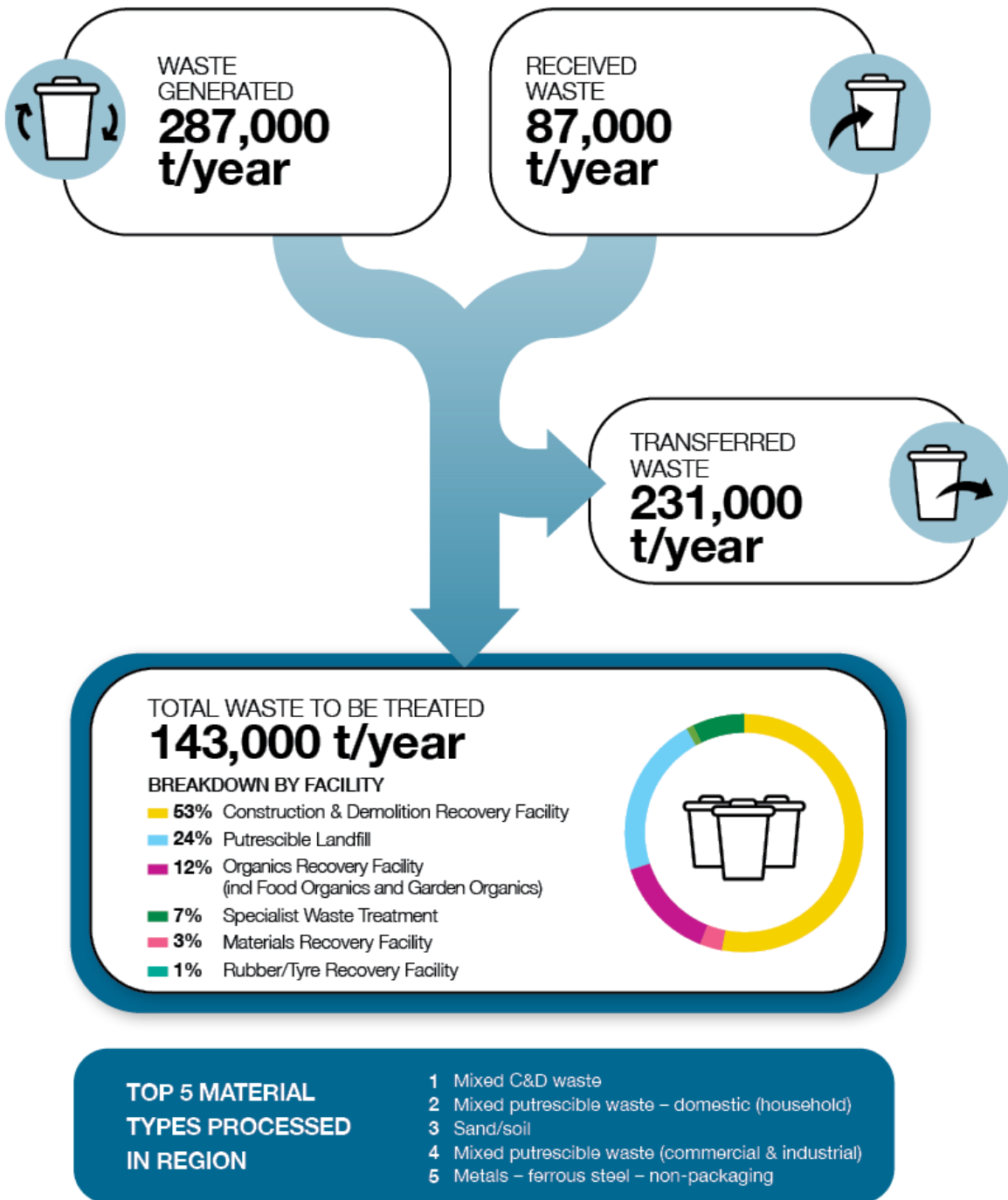


Figure 32 Waste generated, received, transferred and treated in Peel in 2020

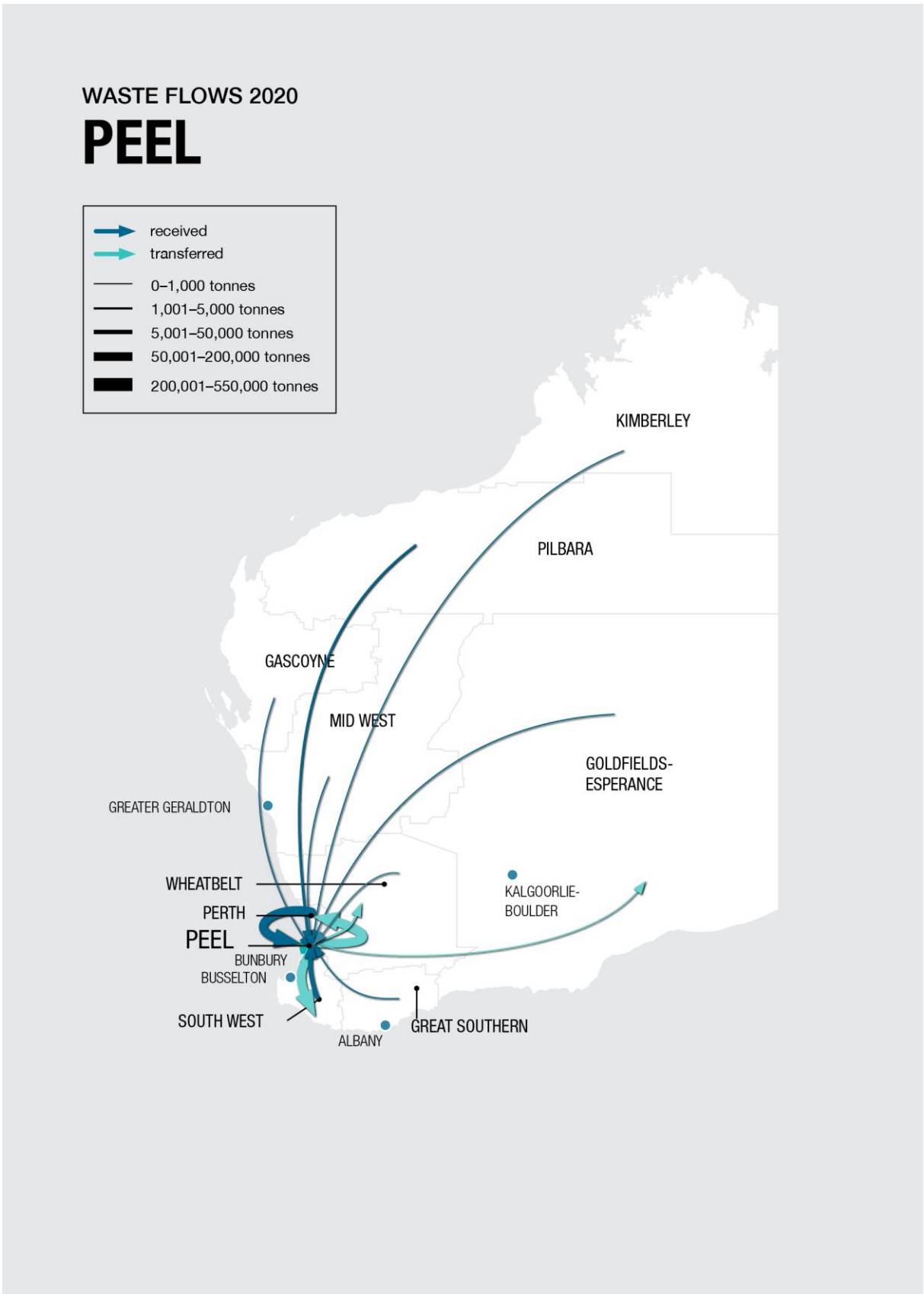


Figure 33 Waste flows in Peel in 2020



CURRENT AND PLANNED  
INFRASTRUCTRE BY REGION  
**PEEL**

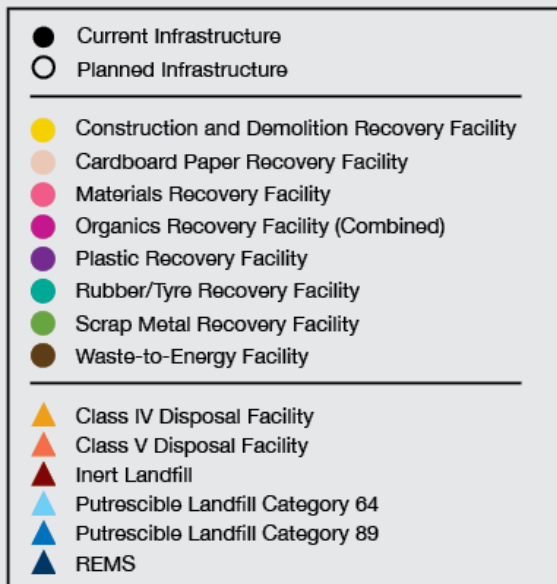
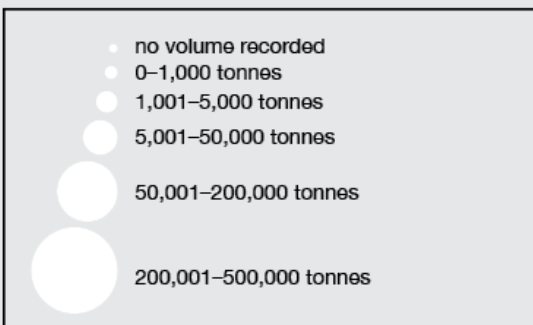
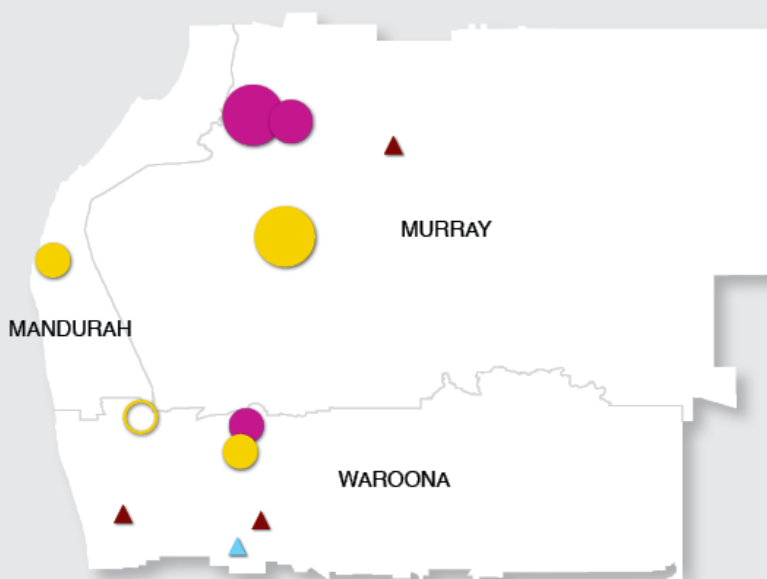
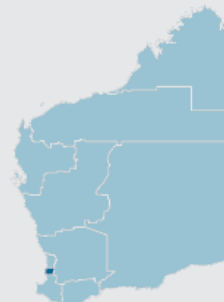


Figure 34 Current and planned infrastructure locations in Peel in 2020

### Waste and resource recovery in 2030

Modelling to achieve all waste strategy targets in 2030 found the Peel region would generate 291,000 tonnes, similar to 2020 quantities.

However, the reduction in materials exported means the total waste treated in Peel will increase by 25 per cent. This shift, along with the addition of new infrastructure, will increase the Peel materials recovery rate from 50 per cent to 67 per cent.

Figure 35 highlights the increase from materials recovery (67 per cent) to resource recovery (materials recovery plus energy recovery; 84 per cent), emphasising the increasing importance of energy recovery in waste management strategies.

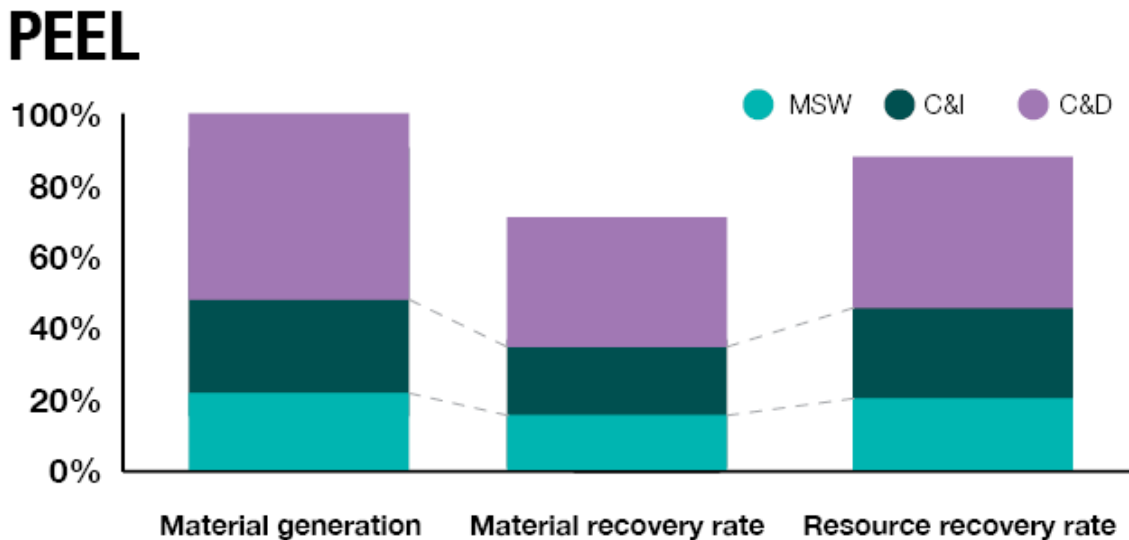


Figure 35 Generation, material recovery and resource recovery by source in Peel in 2030

Figure 36 shows the distribution of feedstock materials used by each facility type, indicating which waste streams are most significant and where the resource recovery efforts should be concentrated. This is also reflected in the Peel region Principles and priorities section.

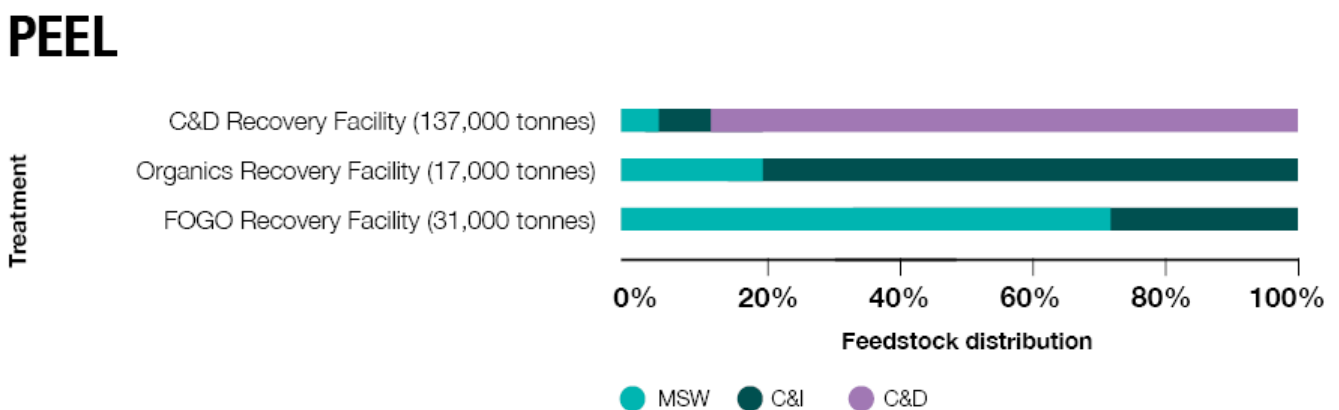


Figure 36 Feedstock distribution of treatments in Peel in 2030

The Peel region is anticipated to provide 69,000 tonnes of FOGO recovery capacity to Perth, as a new facility is expected to add 100,000 tonnes of capacity.

The model uses licensed capacity for facilities and can result in an overestimation of actual capacity. Stakeholder feedback indicates that only a fraction of the region's licensed capacity of 127,000 tonnes of Category 67A capacity is actually available for the processing of FOGO. The Infrastructure priorities section describes the need to investigate further to confirm actual FOGO processing capacity.

### Infrastructure capacity needs in 2030

Based on current, planned and approved infrastructure in 2020, Peel requires the following additional capacities to meet the waste strategy targets in 2030:

- 51,500 tonnes of additional recovery capacity is needed for C&D, which is sufficient capacity to allow for an additional facility.

#### CAPACITY REMAINING BY LANDFILL TYPE

### PEEL

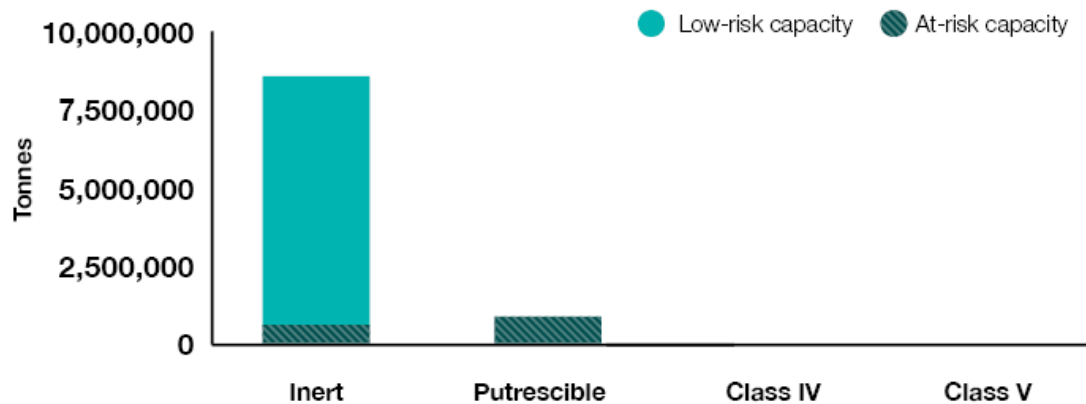


Figure 37 Capacity remaining by landfill type in Peel, including an assessment of low-risk and at-risk capacity

Total remaining capacity by landfill types is presented in . This figure also indicates the proportion of that capacity that is at risk (see section on Landfill capacity lifetime assessment to 2030 and 2050).

Under the low-risk scenario, a total of 1 million tonnes of capacity was identified as potentially at risk, of which inert landfills make up 39 per cent and putrescible landfills 61 per cent. *State Waste Infrastructure Needs Analysis* modelling predicts 24,000 tonnes of residual waste will be disposed of in landfill each year. Feedstock lifetime remaining for landfills is shown in Figure 19

Details of the infrastructure needed to achieve waste strategy targets are outlined in Figure 38, including the expected facilities, capacities and capacity needs in 2030.

CURRENT RECOVERY INFRASTRUCTURE PIPELINE

# PEEL

This overview includes a comparison of projected generation and capacities to determine the infrastructure need in 2030. It includes planned and approved facilities, as well as closures between 2020 and 2030.

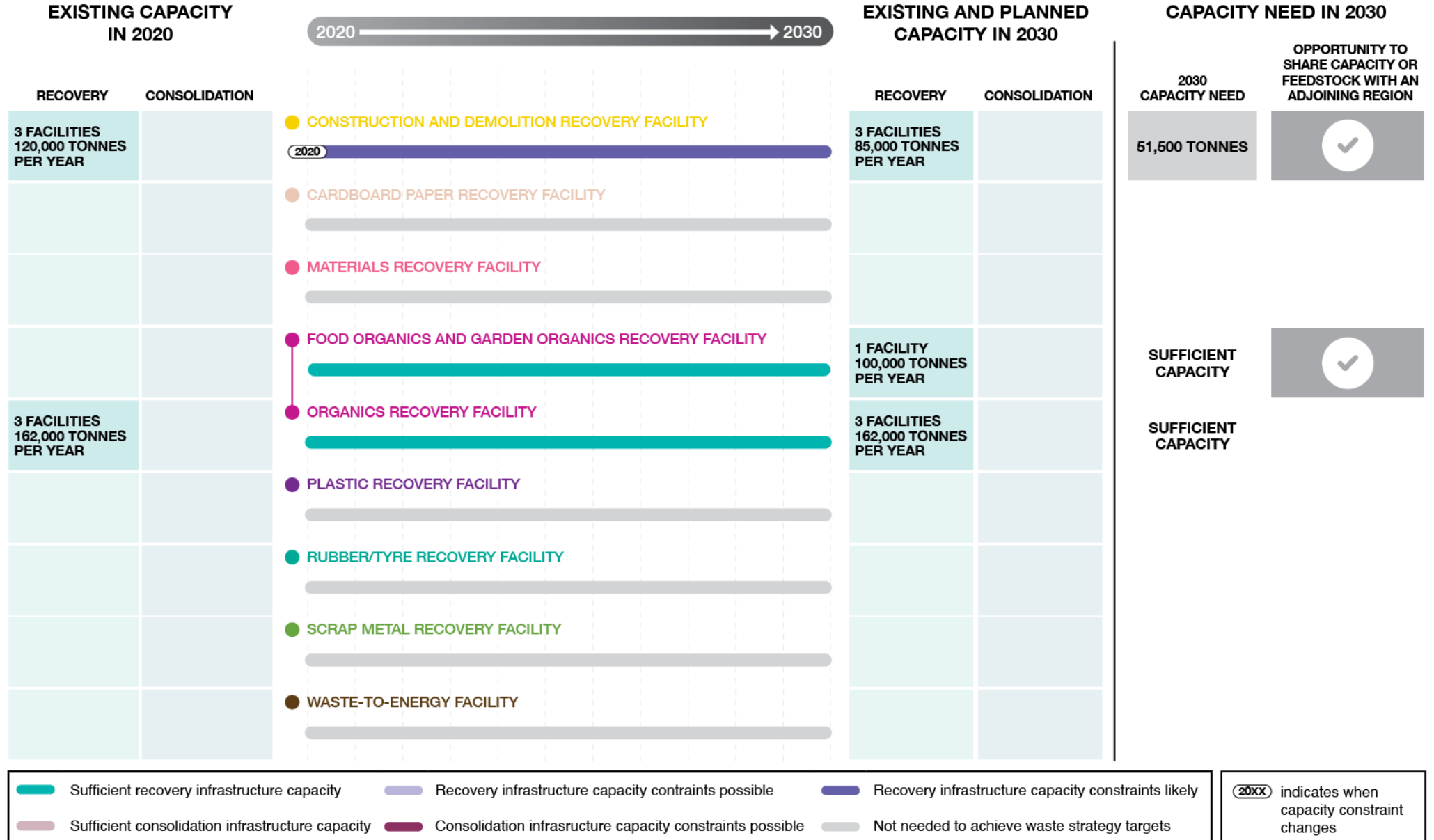


Figure 38 Peel infrastructure pipeline and capacity need in 2030

## Principles and priorities

The principles outlined in this plan have been used to identify priorities.

Priority areas that are projected to go beyond capacity need, based on the completed modelling for the region, arise when applying the principles.

Based on the analysis, the top priorities for the Peel region are:

- Review options to facilitate lifetime and capacity expansion of existing C&D facilities in the region.
- Assess whether 67A licensed facilities can be increasingly utilised to alleviate FOGO recovery capacity need in Perth.
- Monitor progress for implementation of capacity expected from the Food Waste for Healthy Soils program.
- Assess whether existing 67A licensed facilities in Peel or neighbouring regions can be increasingly utilised to alleviate FOGO capacity need.

These are discussed in more detail in Table 26 below. The principles are outlined once more in Figure 2 for reference.

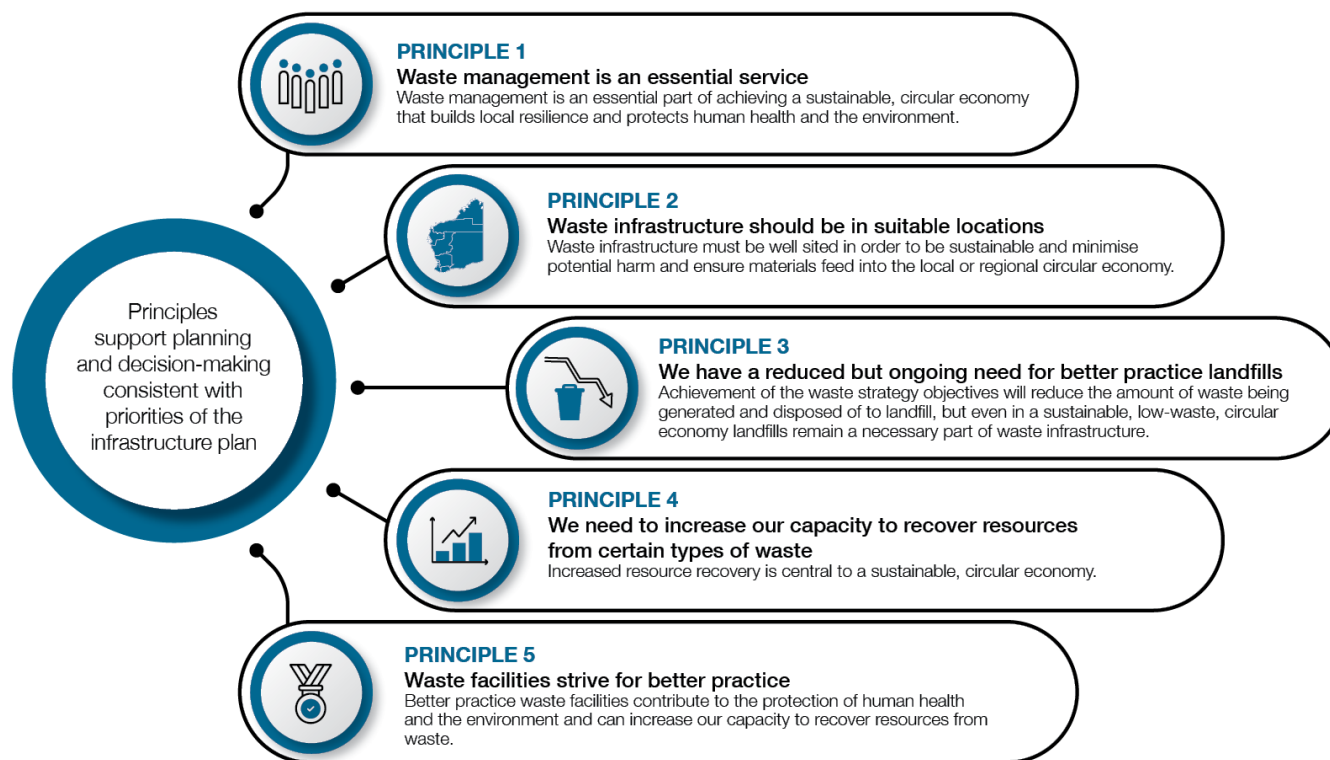


Figure 2 Principles of the State waste infrastructure plan

Table 26 Consideration of infrastructure plan principles and priorities

Capacity needs to achieve waste strategy targets 2030	Consideration of infrastructure plan principles	Findings in response to meeting the waste strategy 2030 target (with assigned priority ranking)
51,500 tonnes of additional capacity for C&D recovery	<p><b>Principle 1: Waste management is an essential service</b> Existing capacity constraints to treat C&amp;D material in Peel will be compounded by future population growth and increased urbanisation. Application of principle 1 indicates that there is a high priority to develop additional C&amp;D processing capacity to support a wide range of development projects.</p> <p><b>Principle 2: Waste infrastructure should be in suitable locations</b> C&amp;D processing benefits from being situated close to the source of generation and offtake markets. Peel's proximity to urban development projects in Perth assist in these considerations. Peel has strong transport networks to facilitate access to state population centres, which will de-risk recovered C&amp;D product offtake. Because of the immediate need for extra C&amp;D capacity, options to expand and extend the life of existing facilities should be prioritised. High urban densities in some areas of the Peel region will restrict development options for siting new infrastructure.</p> <p><b>Principle 4: We need to increase our capacity to recover resources from certain types of waste</b> C&amp;D material is the most-generated material type in the Peel region. Investment in new capacity has low risks in accessing necessary feedstocks. Additionally, recovery rates are typically very high and will support waste strategy Recover targets.</p>	<p><b>High</b> Lifetime and capacity expansions of existing C&amp;D facilities in the Peel region will decrease the risk, capital costs and timeframes required to meet capacity needs.</p>
Large volume of organics allows for development of other processes	<p><b>Principle 2: Waste infrastructure should be in suitable locations</b> Development of bioenergy infrastructure could be located where organics are being processed as an additional option to treat suitable organics, to expand capacity, or to diversify outputs (expanding from compost to energy production). This may present an opportunity for the Wheatbelt region to treat organic waste or FOGO waste that exceeds the treatment capacity of the region.</p> <p><b>Principle 4: We need to increase our capacity to recover resources from certain types of waste</b></p>	<p><b>Medium</b> Three facilities are listed in the region with capacities exceeding 35,000 tonnes, with one of them at 90,000 tonnes. These larger existing facilities may consider options to implement other processes or technologies.</p>

Capacity needs to achieve waste strategy targets 2030	Consideration of infrastructure plan principles	Findings in response to meeting the waste strategy 2030 target (with assigned priority ranking)
	<p>To achieve waste strategy targets, Western Australia needs to recover and process a large volume of organics. Expanding infrastructure to develop facilities that produce bioenergy expands capacity, diversifies options and reduces risk of failure to meet waste strategy targets.</p> <p><b>Principle 5: Waste facilities strive for better practice</b></p> <p>As volumes of organics are captured by large facilities in the region, there is potential to develop other processes. Better practice guidelines or regulatory requirements may change market activities and present an opportunity to utilise bioenergy more in Peel.</p>	
Landfill capacity risk assessment	<p><b>Principle 1: Waste management is an essential service</b></p> <p>Development of new waste-to-energy capacity to service the Perth and Peel regions will decrease the reliance on existing putrescible landfill infrastructure. Excess capacity should still be maintained to provide contingency as waste-to-energy disruptions or disasters have the risk to increase local putrescible waste treatment requirements.</p> <p><b>Principle 2: Waste infrastructure should be in suitable locations</b></p> <p>Government policy restricting new putrescible landfill development on the Swan Coastal Plain significantly reduces options to develop additional local capacity, compounded by high population density rates.</p> <p><b>Principle 4: We need to increase our capacity to recover resources from certain types of waste</b></p> <p>Increased reliance on waste-to-energy treatment for residual waste originating from the Perth and Peel regions will require increased capacity for the recovery of bottom ash. Modelling indicates that, once the two waste-to-energy facilities under development in Perth are in operation, there will be sufficient capacity for the treatment and recovery of bottom ash. If these recovery facilities experience delay or disruption The excess inert landfill capacity in the Peel region could potentially provide a contingency disposal option.</p>	<p><b>High</b></p> <p>Improved outcomes for waste strategy Recover and Protect targets could be achieved through development of capacity for Peel to supply contingency waste-to-energy bottom ash recovery or disposal.</p>