# Energy from Waste Infrastructure Plan

Supporting the NSW Waste and Sustainable Materials Strategy 2041

September 2021

NSW GOVERNMENT

# Energy from Waste Infrastructure Plan 2041

**The NSW Government supports thermal energy recovery as a residual waste management option where it can deliver positive outcomes for the community while protecting human health and the environment.**

Recovering energy from waste can be a legitimate and necessary residual waste management option where it delivers positive outcomes for the community and the environment. The NSW Government supports energy recovery where it makes sense to do so and where it is used to manage genuine residual waste – not as an alternative to waste reduction or recycling.

Through the NSW Waste and Sustainable Materials Strategy 2041 (the Waste Strategy), the NSW Government committed to adopting a strategic approach to the role of thermal energy recovery from waste in NSW to ensure it protects human health and the environment, and supports the transition to a circular economy.

This Infrastructure Plan guides strategic planning for future thermal energy from waste facilities to ensure infrastructure is located in areas that best address the state's waste management needs until 2041, and where it maximises efficiencies for waste innovation, management and energy recovery.

This Infrastructure Plan provides certainty and transparency to industry and the community on how the NSW Government will facilitate the establishment and operation of energy from waste infrastructure to manage genuine residual waste.

## Recovering energy from waste

**What is energy from waste?**

Waste can be thermally treated to recover the embodied energy in that material.

The energy can be recovered as heat or as a solid, liquid or gaseous fuel. These outputs can be used to generate electricity or used directly in machinery, vehicles and industrial processes.

The thermal treatment of waste provides an opportunity to recover the embodied energy from waste, offset the use of 'dirtier' or less 'environmentally sound' energy sources and avoid methane emissions from landfill. However, these outcomes depend on ensuring that energy recovery proposals:

- represent the most efficient use of the resource
- adequately manage the risks of harm to human health or the environment, and
- maximise the environmental, social and economic benefits to communities.

The NSW *Energy from Waste Policy Statement* (the Policy Statement) sets out the technical criteria that apply to energy from waste facilities in NSW.

Not all facilities undertaking the thermal treatment of waste are captured by the Policy Statement or this Infrastructure Plan. Certain activities are excluded as they are not considered to be undertaking genuine energy recovery or there are other regulatory frameworks which apply. These activities are detailed in the Policy Statement.

Facilities that only thermally treat lower risk 'eligible waste fuels' as listed in Part 3 of the Policy Statement and defined in the Eligible Waste Fuels Guidelines, including biomass and residues (also referred to as biomaterial), are excluded from this Plan. They will continue to be permitted across NSW if they comply with planning and environmental legislation and policies.

Information on the regulatory frameworks that apply to energy from waste in NSW, including the Policy Statement, are on the Environment Protection Authority **website** and the Department of Planning, Industry and Environment **website**.

## The role of energy from waste in managing future residual waste

Over the next 20 years, waste volumes in NSW are forecast to grow from 21 million tonnes in 2021 to nearly 37 million tonnes by 2041. At the current rates of generation and recycling, the putrescible landfills (which accept household waste) servicing Greater Sydney are likely to reach capacity within 15 years. The non-putrescible landfills (which accept inert commercial and construction wastes) will reach capacity by 2030. In some regional areas, such as Coffs Harbour and Port Macquarie, landfill capacity is likely to be reached by 2030.[1]

Strategically located residual waste infrastructure is urgently needed, coupled with education, programs and infrastructure that drive waste out of landfill and into the circular economy.

Analysis shows that a mix of potential infrastructure solutions are needed to meet the State's residual waste needs. The Waste Strategy recommends a limited number of energy from waste facilities, as well as extra landfills and 'dirty Material Recovery Facilities' to manage residual waste in NSW.[2]

It identified that by 2030 one large-scale energy from waste facility may be required to service the Greater Sydney region and by 2040 an extra three large-scale energy from waste facilities may be needed. In the Hunter and Northern Rivers regions, the Waste Strategy identified either extra landfill capacity or a medium-scale energy-from-waste facility would be needed to manage waste from those regions.[3]

## Energy from waste principles

The NSW Government has identified principles to guide strategic planning needs for energy from waste infrastructure to ensure such projects protect the environment and human health into the future and maximise efficiencies for waste innovation, management and energy recovery.

Three principles will guide future energy from waste infrastructure in NSW and improve certainty to industry around acceptable locations and facilities. These principles will ensure NSW is taking a precautionary approach to managing the social and human health risks of energy from waste, and that energy from waste is strategically planned to provide the highest public value.

**Energy from waste in NSW must:**

1. improve certainty to communities and industry around acceptable locations and facilities
2. adhere to the precautionary principle where there is a greater risk of harm to human health due to proximity to high population areas (now and in the future), and in areas where there are regular exceedances to air quality standards from existing sources
3. maximise efficiencies in infrastructure, waste management, innovation and energy recovery.

All energy from waste facilities, regardless of their location, must comply with the Policy Statement, including demonstrated supply of feedstock in accordance with the resource recovery criteria. The Policy Statement was revised in June 2021 on the advice of the Chief Scientist and Engineer and sets out the most rigorous environmental controls in the world.

The Policy Statement also requires proponents of energy from waste facilities to provide effective information and public consultation about their proposals. Proponents need to engage in genuine dialogue with the community by providing accurate and reliable information. Operators of an energy from waste facility need to be 'good neighbours', particularly if they are near a residential setting and where there are workers in other nearby facilities.

1 NSW Waste and Sustainable Materials Strategy – 2041 p.11
2 Ibid p. 21
3 Ibid p. 21

## Improving certainty to communities and industry

Setting priority infrastructure areas will provide long term certainty on where energy from waste will be permitted in NSW. Aligned with the **20-Year Vision for Regional NSW**, this Plan will enable businesses and communities to have confidence to invest, hire and thrive. The establishment of energy from waste in the right locations ensures communities will be well placed to attract investment opportunities and benefit from improved transport and freight infrastructure, secure and sustainable access to energy, opportunities for education and training, and have a stable business environment[4].

It is critical that the number and capacity of energy from waste facilities in NSW is strategically managed by the NSW Government so it does not exceed the forecast volume of residual waste. To fail to do so would risk creating stranded assets due to a lack of residual feedstock or lead to an oversupply of energy from waste facilities requiring more residual waste than is available. This could undermine higher priority waste management options and the social and economic benefits these provide to NSW.

Setting priority infrastructure areas will ensure energy from waste is in areas aligned with community and economic need. This includes activating job and economic potential in towns and aligning recycling and waste management priorities in the 20-Year Vision for Regional NSW to support growing regional centres[5].

## Adhering to the precautionary principle

Protecting human health and the environment is a fundamental objective. The NSW Government is taking precautionary steps to restrict energy from waste from parts of NSW to protect human health and air quality. This will ensure new industries, such as energy from waste, are not contributing unnecessarily to health impacts from air quality across NSW.

### Managing human health risk in high density and growing populations

NSW is expected to grow on average by over 100,000 people each year until 2041 and is expected to reach 10.6 million people.

By 2036, Greater Sydney's population will grow to approximately 6.6 million. Two-thirds of Greater Sydney's population growth is expected to occur in Greater Western Sydney, where the population is expected to reach 3 million. The regional NSW population is expected to increase by 400,000 to 3.5 million.

Urban growth is increasing the spatial extent of human induced emissions and exposing more people to the impacts of adverse air quality. There is a need to avoid the exposure of high population centres in NSW to new sources of air emissions and take precautionary approaches for all regional communities, especially those that may be more vulnerable to air quality impacts.

Populations can still experience health impacts when emissions are below the national standards, and for some common air pollutants, there is no safe threshold of impact. It is becoming challenging to comply with the national standards in NSW due to the growing population, tighter national air quality standards and the impacts of climate change. From a population health perspective, even where pollution levels are held constant, health impacts from air pollution are likely to increase over time, simply due to an increase in the number of people exposed due to population growth.

4 20-Year Vision for Regional NSW p.4.

5 Ibid p.9

### Maximising efficiencies

The Waste Strategy outlines the key actions governments, industry and the community need to take to make the transition to a circular economy. Co-locating energy from waste facilities with other resource recovery and waste operations facilitates the circular economy, reduces additional transport between waste management processes and contributes jobs and economic growth in our regions.

Regional precincts that are located on arterial transport routes have enormous potential to become circular economy precincts, where energy recovery sits at the centre of a network of complementary industries that can create jobs and drive innovation.

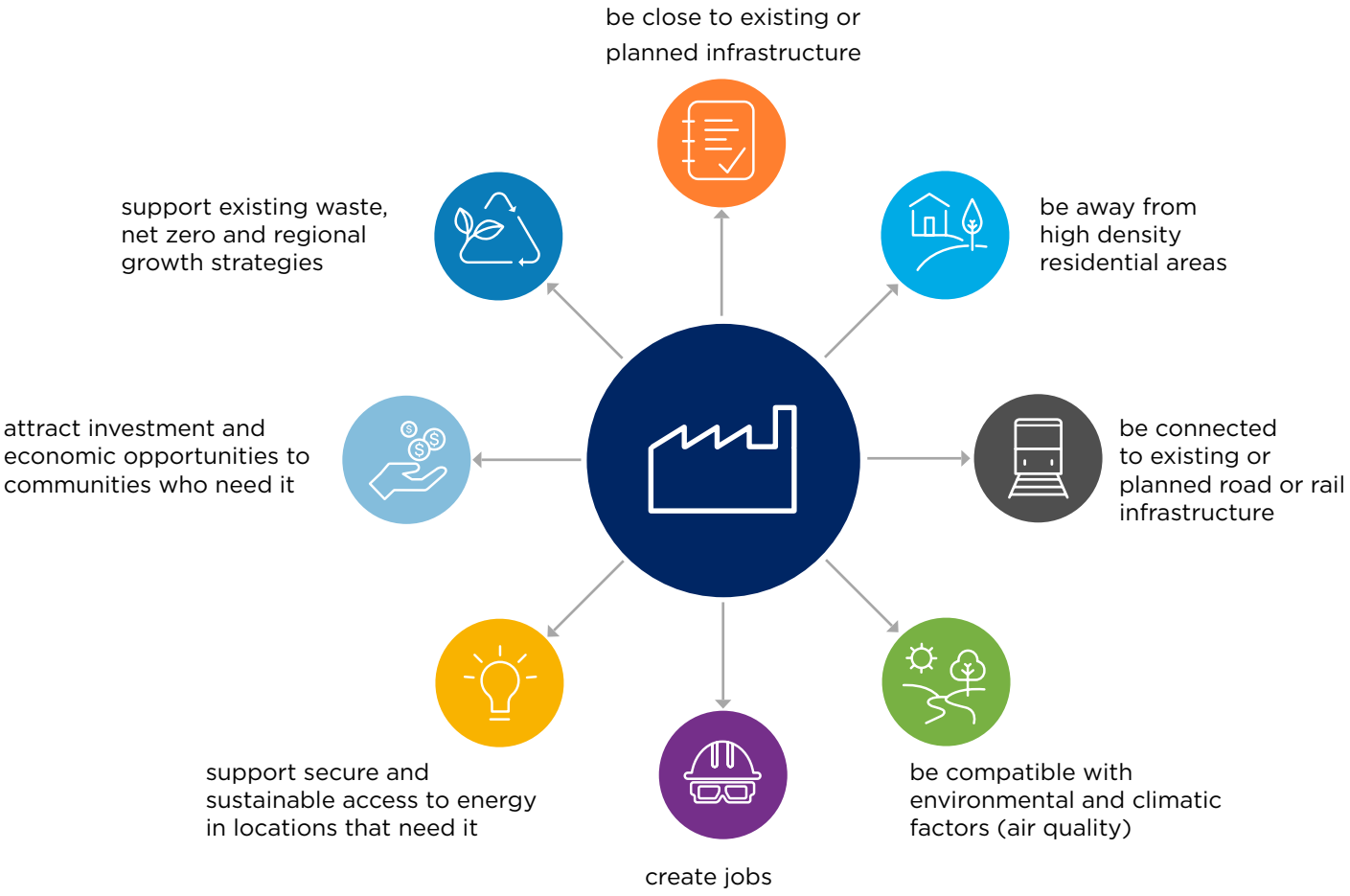
Reducing the emissions generated throughout the waste management lifecycle also supports the Government's commitment of transitioning to a low carbon economy in the *Net Zero Plan 2031.* Energy from waste can play a role in reducing emissions where waste is demonstrated to be a cleaner fuel or feedstock than what would otherwise be used in a manufacturing or industrial process (for example, by replacing coal or liquid-based petroleum fuels).

## Strategic planning for future energy from waste in NSW

The Waste Strategy plans to locate the right infrastructure in the right place to recover, reuse and extend the life of most waste materials. This includes strategic investment in, and planning for, infrastructure to create new jobs, and funding to drive innovation and investment in waste technologies.

While energy from waste facilities have been identified as a part of the State's residual infrastructure needs, their location needs to be strategically planned to ensure they meet the State's waste management demands into the future and maximise the innovation, energy and waste management opportunities in NSW.

**The locations should:**



## Priority infrastructure areas

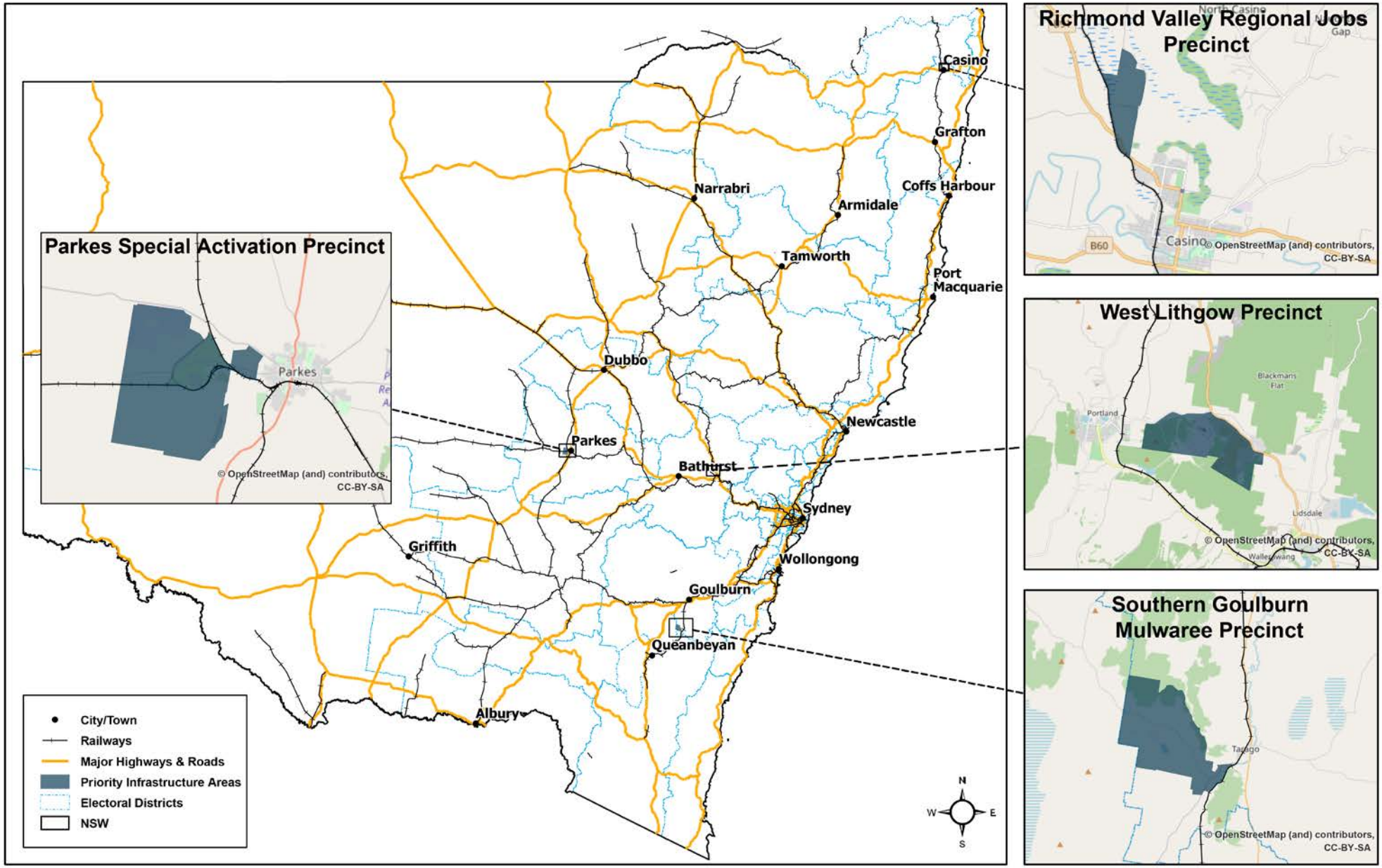
The NSW Government supports energy from waste where it is strategically located to provide the highest public value. This means the establishment and operation of energy from waste infrastructure in areas of NSW that best address long term waste management needs and satisfy social, economic and environmental needs.

To give effect to the energy from waste principles and improve certainty to industry around acceptable locations and facilities, thermal energy from waste facilities must only be established, or permitted to operate, in these four identified priority infrastructure areas or by the exception listed as follows:

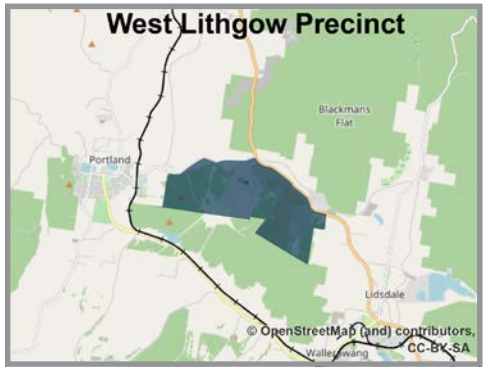
**Energy from Waste Priority Infrastructure Areas**

1. West Lithgow Precinct
2. Parkes Special Activation Precinct
3. Richmond Valley Regional Jobs Precinct
4. Southern Goulburn Mulwaree Precinct, or
5. at facilities that use waste, or waste-derived, feedstock to replace less environmentally sound fuels (including coal or petroleum-based fuels) thermally treated (or approved to be thermally treated) at the site, and the energy produced from the waste is used predominantly to power the industrial and manufacturing processes on-site, rather than exporting that energy to the grid.

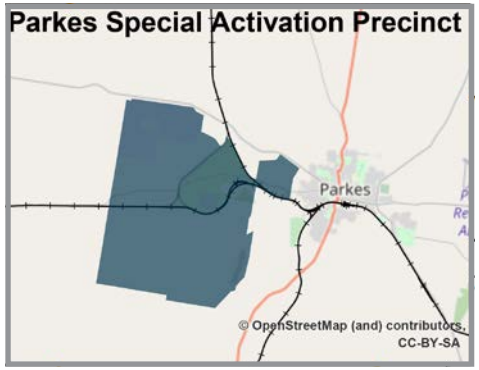
# Priority Infrastructure Areas



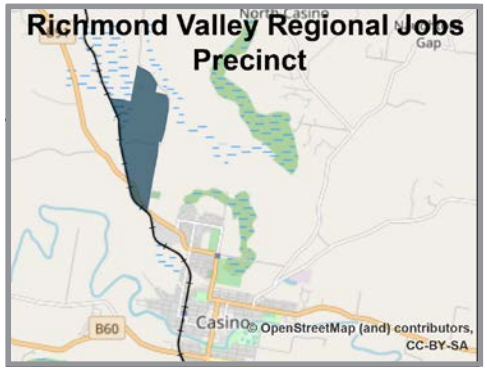
**These four priority infrastructure areas will best deliver on the waste management needs of NSW into the future and the principles of this Infrastructure Plan for these reasons:**



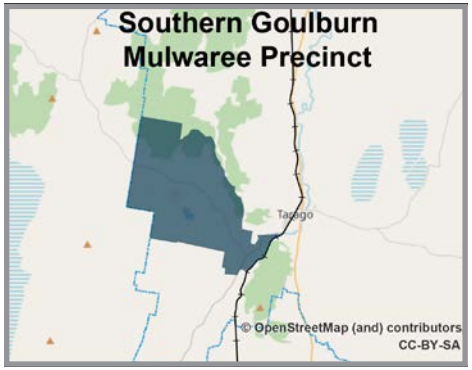

1. The existing facilities in the **West Lithgow precinct** and associated infrastructure will be able to service Greater Sydney and surrounds and utilise existing energy and transport infrastructure and will provide regional jobs and economic growth to Lithgow.




2. **The Parkes Special Activation Precinct** sits alongside the Inland Rail route – a 1,700 km freight network that will connect Victoria, NSW and Queensland – which could provide an opportunity to efficiently service the waste management needs of NSW. The NSW Government has already begun a market-sounding exercise and will continue working with proponents to identify opportunities for energy from waste development in this precinct. This is also supported by the NSW Government's Master Plan for the precinct.

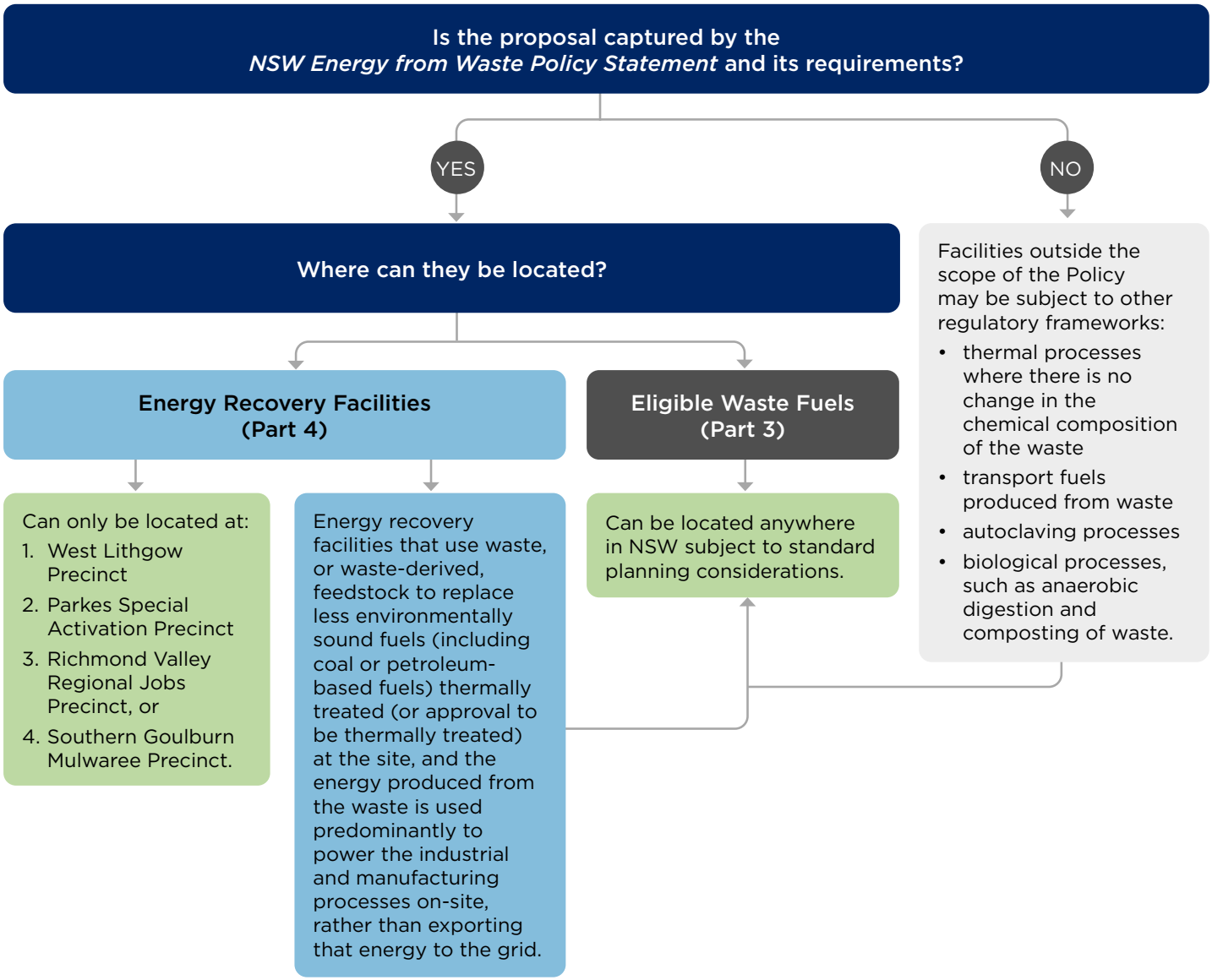



3. **The Richmond Valley Regional Jobs Precinct** could service the waste management needs of northern NSW and catalyse opportunities to create new jobs in the energy and waste management sector. This aligns with actions being taken under the NSW Government's Regional Development Framework.




4. **Southern Goulburn Mulwaree Precinct** and associated infrastructure is co-located and integrated with other resource recovery, waste management and renewable energy generation and has existing infrastructure in place to import waste from Greater Sydney and other regional locations.

Exemptions are provided across all of NSW where the use of waste or waste-derived feedstock replaces coal or petroleum-based fuels – or a less environmentally sound fuel – to generate energy at a site, and where that energy is then used predominantly to power an industrial or manufacturing process on-site, rather than exporting electricity to the grid.




## Future needs for energy from waste

The NSW Government will assess the need for additional energy from waste capacity by 2025, and again by 2030, in line with the Waste Strategy targets.

If required, additional energy from waste priority infrastructure areas will only be considered where it meets the principles set out in this Plan within the following areas:

- former mine sites
- former thermal electricity generation sites
- Special Activation Precincts (SAPs)
- Regional Jobs Precincts, or
- at facilities that use waste or waste-derived feedstock to replace less environmentally sound fuels (including coal or petroleum-based fuels) thermally treated (or approved to be thermally treated) at the site, and the energy produced from the waste is used predominantly to power the industrial and manufacturing processes on-site, rather than exporting that energy to the grid.

This will ensure future thermal energy from waste infrastructure in NSW continues to protect the environment and human health and maximises efficiencies for waste innovation, management and energy recovery.

## Requirement to comply with environmental and planning laws

Any proposals within the priority infrastructure areas will still be required to comply with current planning and environmental legislation and policies. The assessment process considers all relevant legislation, policies and plans, specialist advice from government agencies or other technical experts, feedback and submissions made by stakeholders, and the applicant's response to these.

This process requires applicants to prepare an Environmental Impact Statement to address all the issues and studies required by the Planning Secretary's Environmental Assessment Requirements (SEARs) which are developed in consultation with, and on advice from, stakeholders, including local councils and state government agencies. Submissions are invited from the community, local council and government agencies during public consultation on the Environmental Impact Statement.

Under the Policy Statement, proposals must:

- meet current international best practice techniques, including emissions controls
- use technologies that are proven, well understood and capable of handling the waste inputs
- meet technical, thermal efficiency and resource recovery criteria
- undertake monitoring with real-time feedback.

If approved, the planning consent and environment protection licence set out the conditions for operating, monitoring and reporting. The environment protection licence can require additional studies or programs of work to be undertaken.

## Action plan

This plan lists the actions the NSW Government will deliver to give effect to this Energy from Waste Infrastructure Plan.


| Actions | | Indicative timings |
|---|---|---|
| Revisions to the NSW Energy from Waste Policy Statement | On the advice of the NSW Chief Scientist and Engineer, changes are required to ensure NSW has the strictest air emissions standards in the world | Delivered in June 2021 |
| Release the NSW Waste and Sustainable Materials Strategy | Sets out the key objectives and actions underpinning NSW's transition to a circular economy. | Delivered in June 2021 |
| Improve information on the application of the NSW Energy from Waste Policy statement | Publication of Guide to NSW Energy from Waste Framework | September 2021 |
| | Changes to planning instruments | October 2021 |
| Progress changes to legislation to hardwire the strategic planning needs and improve the consistency of laws that apply to energy from waste | Amendments to various environmental and planning legislation | Late 2021 – early 2022 |

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ISBN 978 1 922447 71 5 EPA 2021P3261

Front cover photo: Garbage truck and residential bins.

Page 6 photo: Transfer truck unloading waste, landfill operations. Photo: Evolving Images/EPA.