



# Biomass Factsheet

## What is Biomass?

Biomass refers to organic material that comes from plants and animals. It is a renewable energy source because it can be replenished naturally over time. Biomass stores energy from the sun, and when it's burned or converted, it releases that energy as heat, electricity, or fuel.

Traditional biomass, such as wood and dung, have been used for heating and cooking for centuries and remains the main source of energy in many low-income countries across Africa and Asia. Modern biomass refers to residual streams from the forestry, agriculture, municipal and industrial sectors. Biomass also includes sustainably grown energy and wood crops.

## Applications

Advanced bioenergy solutions, such as sustainable aviation fuel, renewable diesel and biomethane use modern biomass sources as feedstocks.

The chemical composition of the biomass determines the technology conversion process utilised and end-product. Biomass from plants is mainly composed of lignin and cellulose, whereas biomass from animal origin combines proteins, lipids, and carbohydrates.

In Western Australia (WA) the main categories of feedstock readily available for advanced bioenergy are grain crop residues, plantation forestry woodchip and residues, oil mallees and animal effluent. Energy crops with environmental co-benefits are an emerging technology which are being considered within the South West Agriculture zone and the Pilbara.

## Technology Pathways

To be transformed into higher value commodities, biomass is refined through one or more steps. Conditioning refers to processes such as drying, milling, and chipping to reduce the feedstock size and increase its energy density.

During the pre-treatment and conversion steps, biomass is decomposed and then refined into a biofuel suitable for mechanical, thermal, chemical, biochemical or electrochemical processes. Most conversion processes are specific to targeted biofuels while most feedstock can be used for any conversion process.

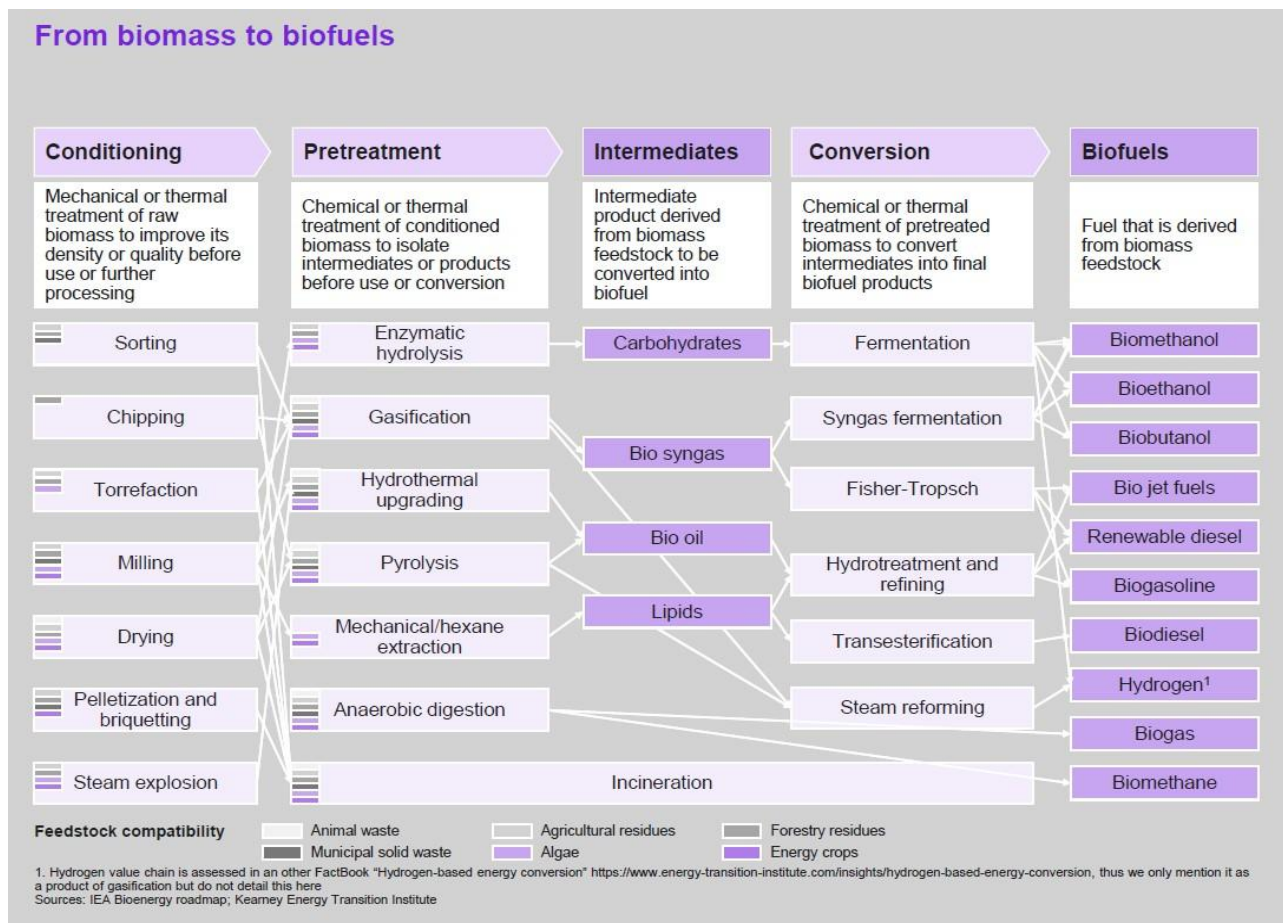


Figure 1. Source: [Biomass to energy – Developing sustainable carbon circularity – looking at advanced application and business models](#), Kearney Energy Transition Institute, 2020

## Drivers and Opportunities

In WA, agricultural residues, agroforestry and energy crops offer the greatest opportunities to supply sustainable biomass for advanced biofuel production. Economic and social benefits to farmers and regional communities are matched by the broader environmental benefits including reducing greenhouse gas emissions.

Cereal crop residues offer the greatest volume of biomass. Depending on stubble retention, WA has a range of biomass available at approximately 7 to 16 million tonnes per year.

Identifying the optimal feedstock and pathway for each advanced biofuel is crucial for bioenergy penetration and relies on multiple criteria such as energy efficiency, GHG emission, energy consumption, nature of the by-products, cost, maturity, and scalability.

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