South Australian Spatial Data Collection Methodology

Urban Organic Waste:

Municipal Solid Waste, Construction & Demolition, Commercial & Industrial

This document describes the methodology for processing, analysing and delivering the South Australian component of the Australian Biomass for Bioenergy Assessment (ABBA) for upload onto the Australian Renewable Energy Mapping Infrastructure (AREMI).

The National ABBA Team have consulted widely to ensure a consistent and standardised representation of biomass feedstock data with regard to organisation of content, units of measurement and aggregation methods. This has led to the development of a baseline schema including minimum data requirements for data capture and upload. It is expected that this approach will lead to a robust and repeatable method for data capture and generation of datasets for use across all regions. There will be some variation however, in the way in which each state characterises various feedstocks depending on source data, data analysis techniques, expert advice and other considerations.

Every effort has been made to provide a consistent and consultative approach to data collection and presentation in order to provide the best outcome for users.

What is the Australian Biomass for Bioenergy Assessment?

The purpose of ABBA is to catalyse investment in the renewable energy sector by providing detailed information about biomass resources across Australia. This information will assist project developers make decisions for new bioenergy projects, and provide linkages between potential biomass feedstocks - through the supply chain - to end users. To achieve this, ABBA collects datasets, on a state-by-state basis, about the location, volumes and availability of biomass, and publishes them on the AREMI platform.

https://nationalmap.gov.au/renewables/

ABBA is managed by the Rural Industries Research and Development Corporation (RIRDC), with funding support from the Australian Renewable Energy Agency (ARENA).

Why Urban Waste

The generation of bioenergy and production of biofuels from organic residues, such as Municipal Solid Waste (e.g. kerbside green bins), Construction & Demolition (e.g. timber & site rubbish) Commercial & Industrial (e.g. bio-solids, food production) has the potential to provide positive outcomes.

Some of the advantages of using urban waste residues as a biomass feedstock include:

- Improvement of urban waste management practices
- Economic benefits e.g. convert cost of waste management/removal to potential revenue stream
- Environmental benefits e.g. diversion from landfill
- Diversification of revenue streams for businesses with excess waste product
- Possibility of reduced energy costs
- Offset/reduce GHG emissions

What data about Municipal Organic Waste is uploaded to AREMI?

ABBA has published the following data onto AREMI:

– Residues - from municipal solid waste, construction & demolition and commercial & industrial activities
– Built up areas – urban areas where waste streams are likely to be generated

Method

Urban Organic Waste (including Municipal Solid Waste, Construction & Demolition and Commercial & Industrial)

Municipal Solid Waste

Biomass residues for MSW that were included in the biomass data set were:

• Kerbside collected waste:

o Source separated organics

o Rubbish (landfill) organics fraction

• Other Municipal Waste

The kerbside collection of waste and recycling in South Australia is surveyed annually by LGA. This data set for 2014-15 was obtained (Office of Local Government, 2016).

For source separated organics, the values from this LGA survey data for kerbside organics collection were used. These values were then multiplied by 95% (assumed value to allow for potential contamination/other materials that might be present) to estimate the potential biomass residue that could be derived from this material.

For the rubbish organics fraction, the value for kerbside rubbish collected from the same LGA survey data were used. These values were then multiplied by 45% (for the assumed organic fraction present) to estimate the potential biomass residue that could be derived

from this material. This value of 45% was inferred from recent kerbside audit data collected for South Australia (Zero Waste SA, 2009).

The State-wide volume of other municipal waste collected as a biomass residue was estimated by subtracting the kerbside collected organics from the total municipal derived organics reported in the South Australia Recycle Activity report 2013-14 (Zero Waste SA, 2015). This State-wide value was split between LGA based on population obtained from ABS statistics (ABS, 2017).

Note: This method provides a singular estimate of biomass residues in that year. Municipal residue volumes may vary from year to year. Future biomass data sets could consider providing a range for these biomass residue volumes, which may better reflect the uncertainties in annual volumes that may be generated. It is also important to recognise that source separated organic residues will already be subject to some type of resource recovery and reuse (e.g. manufacture of mulch and compost products, anaerobic digestion for energy production). Future data sets could quantify this resource recovery activity.

Commercial & Industrial

There have been several surveys undertaken in South Australia or specific regions to collect biomass-related data from commercial and industrial sources. However, this data is usually collected on a confidential basis and is only reported and publicly available in anonymised format. This makes it a challenge to disaggregate and to identify specific large or major biomass sources.

In view of this, State-wide data for (source separated) organics resource recovery reported by the South Australia Recycle Activity report 2013-14 (Zero Waste SA 2015) was used to estimate potential biomass residues by ABS SA4 Regions for the following categories.

- Food organics
- Garden organics
- Timber organics
- Other organics

Some internal experience and knowledge of major C&I activity across the State was used to assign the estimated volumes of biomass residues between different regions that could be attributed to major point sources. The balance of the organics biomass volumes (not allocated in this way) was first split according to reported Metropolitan and Regional splits provided in the South Australia Recycle Activity report 2013-14 and then distributed between the regions according to population.

The State-wide data from this same survey for C&I rubbish (landfill) disposal was also used to estimate potential biomass residue present as landfill organic fraction for each of the ABS SA4 Regions. A value of 51% was assumed as the potential organic fraction in the C&I landfill disposal stream based on most recent landfill survey data (publicly) available (Zero Waste SA, 2007). This estimated organic fraction in the rubbish was first split according to reported Metropolitan and Regional splits provided in the South Australia Recycle Activity report 2013-14 and then distributed between the regions according to population.

Note: This method provides a singular estimate of biomass residues in that year. Commercial residue volumes are more stable from year to year but future biomass data sets

could consider providing a range for these values, which may better reflect the uncertainties in annual volumes that may be generated. It is also important to recognise that source separated organic residues will already be subject to some type of resource recovery and reuse (e.g. manufacture of mulch and compost products, meat rendering, anaerobic digestion for energy production, extraction of biochemical compounds or materials, refuse derived fuel). Future data sets could quantify this resource recovery activity.

Construction & Demolition

Like the C&I estimate of biomass residues, the C&D biomass data set was drawn from the South Australia Recycle Activity report 2013-14 (Zero Waste SA 2015). This included data for:

- Source separated organics:
    - o Garden organics
    - o Timber organics
    - o Other organics
- Rubbish -Organics Fraction

The methodology applied was almost identical to that for C&I Waste except that source separated organics the State-wide volumes were only split between Metropolitan and Regional areas and then distributed by population to ABS SA4 Regions; there was no initial or separate assignment needed to reconcile region-based biomass residues for substantive point sources.

Note: The same notes made for C&I Waste – Biomass residues also apply to C&D Waste – Biomass residues.

Urban Organic Waste – Mapping considerations for the AREMI

As the C&D and the C&I data is presented at the ABS SA4 level, Built up areas have been provided as an overlay to give users an indication of where the activity is in the landscape. This landuse information is indicative only.

The landuse spatial data has been sourced from ABARES (http://www.agriculture.gov.au/abares/aclump/land-use/data-download) and contains the combined datasets of the South Australian areas land use mapped to May 2008 (and 2014 South East and SA River Murray corridor). The data presented is a subset of the original data comprising only landuse classified as Cropping.

Level of Current Use

An attempt was made to estimate the proportions of each of the various categories that is currently disposed of (and hence could be considered most available for redirection into bio-industrial use). As mentioned previously, some of these residues may be resource recovered and reused and others may have a logistic or economic barrier to recovery.

This is an area where more information will become available as the project progresses.

Outputs

The final data outputs are:

- Municipal Solid Waste
- Construction & Demolition
- Commercial & Industrial
- Built Up Areas: Urban Areas Landuse Footprint

Assumptions

For this initial version, readily available public data and reports were used, which others can access to reproduce this data set if necessary. In some areas, original methods have been developed and assumptions made on how to convert source data into biomass resource estimates. These methods and assumptions were informed by the knowledge and expertise of experts engaging with biomass generating activities in South Australia. These experts have also been involved with reviewing and preparing similar data sets for other State Government agencies.

The scope and quality of this initial data set is necessarily limited by the scope and quality of the information in the data sources used, types of methods, and assumptions used when converting source data into biomass resource estimates. These assumptions should be kept in mind when interpreting the SA Biomass data set.

Note

The data that has been analysed and uploaded to AREMI is based upon sources, experimentation and methodology which, at the time of preparing this document, were believed to be reasonably reliable and the accuracy of this information subsequent to this date may not necessarily be valid.

It is important to recognise that this is the first version of this type of State-wide biomass data set that has been prepared for South Australia. The data set relies on readily available public data and reports so that others are then able to access this information to reproduce

this data set if necessary. However, this publicly available data is relatively limited. There are potentially other more detailed data sets that could be used to improve the scope and resolution of the SA Biomass data set.

Over time it is expected that the feedback gained from the initial baseline data that is currently being uploaded to AREMI will help to inform subsequent versions of the information contained in the various data sets.

Methods and assumptions were also developed on how to convert source data into biomass resource estimates. These were based on a similar previous (biomass mapping) study undertaken for the Limestone Coast region of South Australia. These methods and assumptions, too, could be expanded, refined, and improved in future versions of the SA Biomass data set.

Consequently, this inaugural State biomass data set should be considered an important starting point for future development of improved knowledge about biomass resources potentially available in South Australia for bioenergy opportunities. It can reasonably be expected that over time this initial SA Biomass data set will continue to evolve and expand in scope and detail, which should improve its utility for potential bioenergy investors.

Data Sets and Data Sources

For the Urban Organic Waste Biomass Residues the following data sets have been produced using the listed data sources and the limitations of this data have been described.

Data Set:

Municipal Solid Waste

Source Data:

Local Government kerbside collection data (2014-15) collected by the Office of Local Government

Limitations/Clarifications:

Geographical areas are Local Government Areas

Municipal residue volumes may vary from year to year

Source separated organic residues will already be subject to some type of resource recovery and reuse (e.g. manufacture of mulch and compost products, anaerobic digestion for energy production). Future data sets could quantify this resource recovery activity.

Data Set:

Construction & Demolition

Source Data:

South Australia Recycle Activity report 2013-14 (Zero Waste SA 2015)

Limitations/Clarifications:

Geographical areas are ABS SA4 Regions

C&D residue volumes may vary from year to year

Source separated organic residues will already be subject to some type of resource recovery and reuse (e.g. manufacture of mulch and compost products, anaerobic digestion for energy production). Future data sets could quantify this resource recovery activity.

Data Set:

Commercial & Industrial

Source Data:

South Australia Recycle Activity report 2013-14 (Zero Waste SA 2015)

Limitations/Clarifications:

Geographical areas are ABS SA4 Regions

C&D residue volumes may vary from year to year

Source separated organic residues will already be subject to some type of resource recovery and reuse (e.g. manufacture of mulch and compost products, anaerobic digestion for energy production). Future data sets could quantify this resource recovery activity.

References

ABS. (2017). Data by Region. Retrieved March 27, 2017, from http://stat.abs.gov.au/itt/r.jsp?databyregion#/

Office of Local Government. (2016). LGA Kerbside Collection Data 2014-15. South Australian Department of Planning, Transport & Infrastructure.

Zero Waste SA. (2007). DISPOSAL BASED SURVEY - OCTOBER/NOVEMBER 2007.

Zero Waste SA. (2009). Zero Waste South Australia Food Waste pilot Kerbside Audit 2008-09 Master Report. Prepared by: EC Sustainable

Zero Waste SA. (2014a). Biomass Mapping Study for the South East.

Zero Waste SA. (2015). SA 2013-14 Recycling Activity Report. Prepared by: Rawtec.

Methodology Report – SA Biomass Data set for AREMI (2017). Prepared by Colby Industries

For more information

Mary Lewitzka, RenewablesSA, LCEU, DPC Email: Mary.Lewitzka@.sa.gov.au
Phone: (08) 8429 5084 Web: www.dpc.sa.gov.au