

# NSW Biomass Power Generation

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## 1. The largest biomass fuel source for electricity in NSW is **wood**

Energy NSW has makes the following false statement on its website<sup>1</sup>:

*“In 2017, bioenergy power generators produced around 1.5% of the total electricity generated in NSW (including the ACT). The majority of the state’s bioenergy comes from bagasse (the dry pulpy residue left after the extraction of juice from sugar cane), which is why three sugar mills have installed cogeneration plants. Sugar mills use bagasse-produced electricity and low-pressure waste steam for sugar milling and refining processes. Three of our biggest are:*

*Broadwater Bioenergy Plant – capacity 38megawatts (MW)*

*Condong Bioenergy Plant – capacity 30MW*

*Harwood sugar mill – capacity 4.5 MW”*

This statement is incorrect for the following reasons:

- Bagasse does not comprise the majority (greater than 50%) of the state’s bioenergy and has not done so in any of the last ten years;
- Bagasse burning has been trending downwards since 2014;
- ‘Wood waste’ was a larger fuel source than bagasse in NSW in each of the last three years;
- ‘Wood waste’ was the largest fuel source for biomass burning LGCs in NSW last year; and
- Wood waste was a larger fuel source than bagasse even *at one of the state’s sugar mills* last year.

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<sup>1</sup> <https://energy.nsw.gov.au/renewables/renewable-generation/bioenergy> accessed 23 August 2020

NSW Energy’s statement especially downplays the burning of “wood waste” (of various types, including native forest), which has recently become a growing fuel source throughout the state.

NSW Energy should also be questioned about the sharply rising use of “fuel crops” at NSW sugar mills under the RET, including whether sugar mills are burning unprocessed sugar cane crops for electricity.

## 2. Which biomass fuel sources are burned for electricity under the RET in NSW?

The table below shows generation of Large-Scale Generation Certificates (LGCs) under the Renewable Energy Target for different fuel sources in NSW (listed by creation year for the LGC). It combines data from all power generators and relevant biomass burning fuel types (see Appendix 2 for fuel types).<sup>2</sup>

Table 1:

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020 to date
<b>Agricultural waste</b>	0	0	0	2,749	2,606	4,936	2,092	3,399	4,834	8,662	15,639
<b>Bagasse</b>	136,494	75,115	107,886	37,128	209,346	162,251	195,853	129,496	160,859	127,407	36,672
<b>MSW biomass-based</b>	4,933	1,601	114	0	3	7,531	16,246	28,474	46,706	20,311	4
<b>Black liquor</b>	124,704	123,879	147,524	177,752	151,945	178,379	168,252	174,859	197,482	168,818	77,080
<b>Energy crops</b>	7,584	5,631	7,174	13,378	29,205	32,598	30,556	44,099	85,888	116,459	74,955
<b>Food processing waste</b>	0	211	0	0	0	0	0	0	1,867	1,998	1,048
<b>Food waste</b>	9,139	5,461		3,497	6,571	11,371	6,529	8,979	7,027	8,900	7,092
<b>Wood waste</b>	131,735	131,735	92,243	94,023	155,128	140,788	169,448	210,551	178,369	198,944	132,032

The table includes all LGCs from all electricity generators in the state <sup>3</sup>

However, the chart does not include wood waste burning for purposes other than LGC generation, which is certainly occurring – for example, for the purposes of heat generation or electricity generation that does not qualify for LGCs under the current regulations. Where this is already occurring, it proves that the already subsidised price of wood as a fuel source is sufficiently low that no further financial subsidy or incentive is required.

The charts below illustrate that ‘wood waste’ LGCs are increasing. In most years in the last decade, there have been more LGCs from wood waste than bagasse.

The other significant fuel source for LGCs was ‘black liquor’, a byproduct of wood pulp processing which is not the focus of this briefing note.

<sup>2</sup> Source: <https://www.rec-registry.gov.au/rec-registry/app/public/lgc-register>

<sup>3</sup> The tables in this paper are based on the ‘creation year’ for the LGCs. The tables include LGCs that were subsequently surrendered due to RET obligations or voluntary Green Power surrenders, because they were initially generated under the scheme. The recent years also include some LGCs that are pending audit. The tables do not include LGCs that have been disqualified due to audit.

In the current year to date, 'wood waste' is by far the largest fuel source for LGCs, generating more than three times more LGCs than bagasse. 132,032 'wood waste' LGCs have been generated to date, so 2020 is likely to be a record year for burning forests to make electricity.

The diagrams below illustrate the figures in Table 1.

Diagram 1 – Biomass burning LGC creation in NSW by fuel source 2010-2019

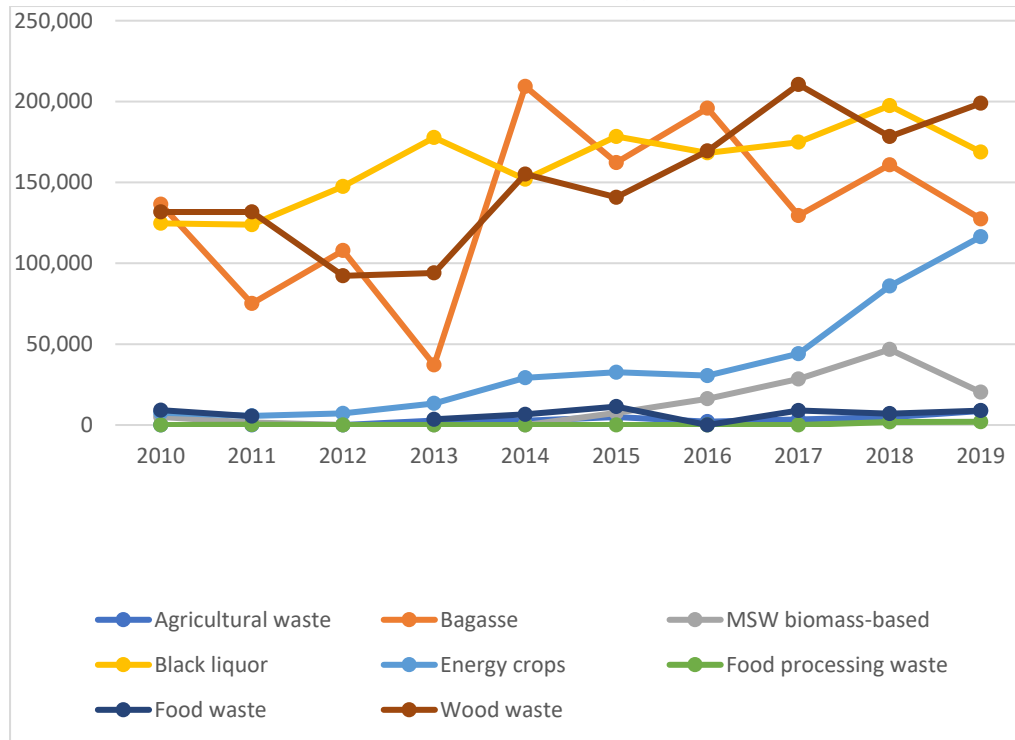
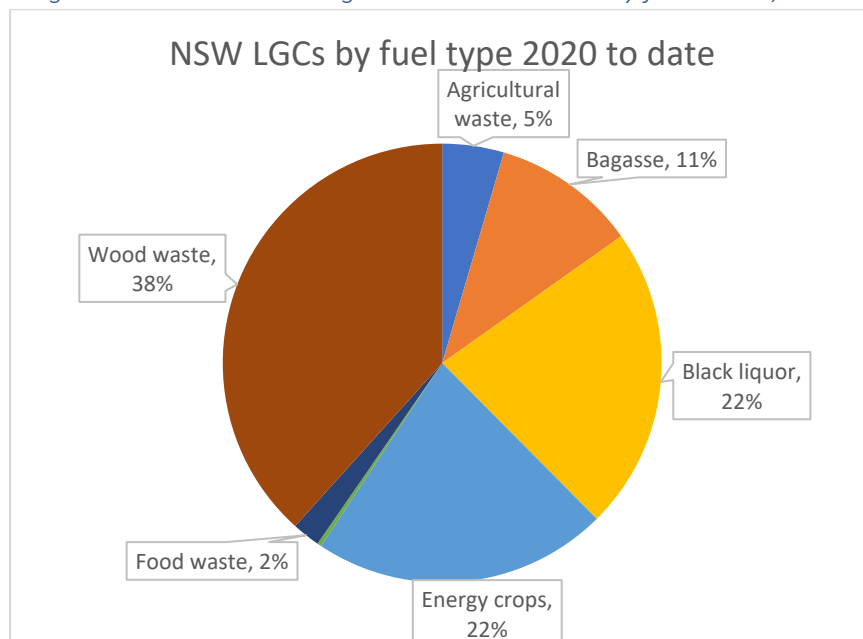


Diagram 2 – Biomass burning LGC creation in NSW by fuel source, 2020 to date



### 3. Which NSW power stations are burning wood to make electricity?

In the last decade, seven power stations have generated LGCs in the 'wood waste' category. The charts are based on the table below and are listed by LGC creation year.

Last year, the two biggest generators of LGCs from 'wood waste' were two sugar mills, which each burned more 'wood waste' than bagasse (see fuel breakdowns for those mills in question 4 below).

Table 2

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020 to date
Big River	1,285	827	1,042	609	8	0	0	0	0	0	0
Broadwater	20,589	19,188	19,154	10,430	39,382	38,750	54,037	74,471	47,529	69,377	46,041
Condong	58,561	24,592	17,717	13,807	31,177	18,022	35,604	43,377	39,345	33,910	30,530
Vales Point	0	0	0	11,063	35,832	28,206	20,093	28,149	24,581	38,624	25,487
Wallerwang	232	1,090	0	0	0	0	0	0	0	0	0
Harwood	0	524	703	0	0	0	233	665	713	628	279
Visy	51,068	37,943	53,627	58,114	48,729	55,810	59,481	63,889	66,201	56,405	29,695
<b>TOTAL</b>	<b>133,745</b>	<b>86,175</b>	<b>94,255</b>	<b>96,036</b>	<b>157,142</b>	<b>142,803</b>	<b>171,464</b>	<b>212,568</b>	<b>180,387</b>	<b>200,963</b>	<b>132,032</b>

Diagram 3

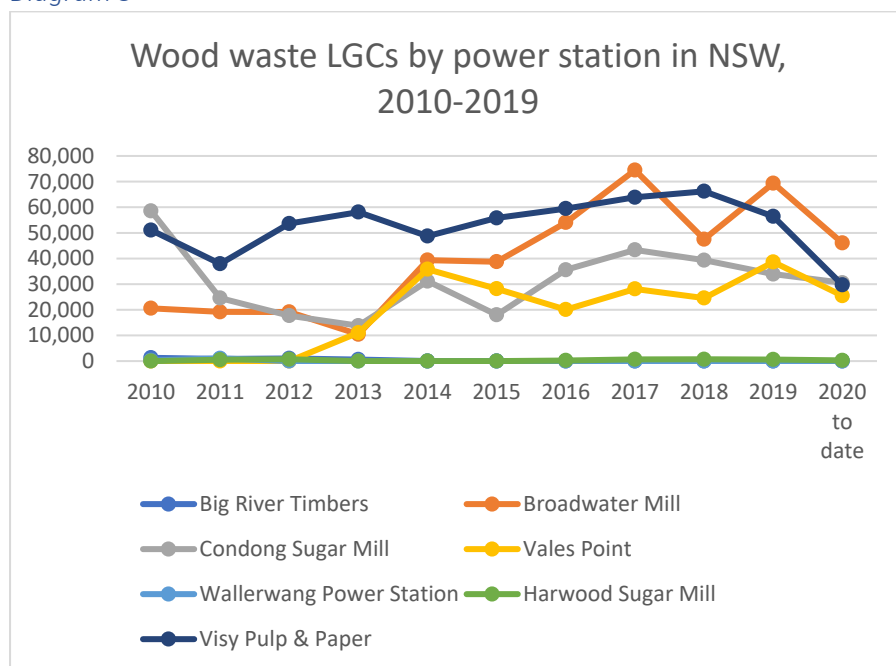


Diagram 4

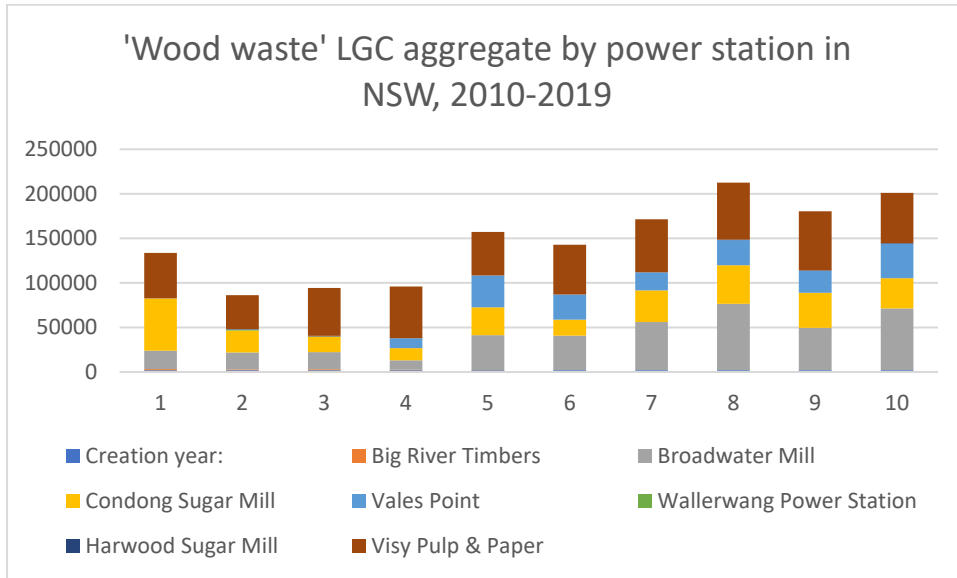
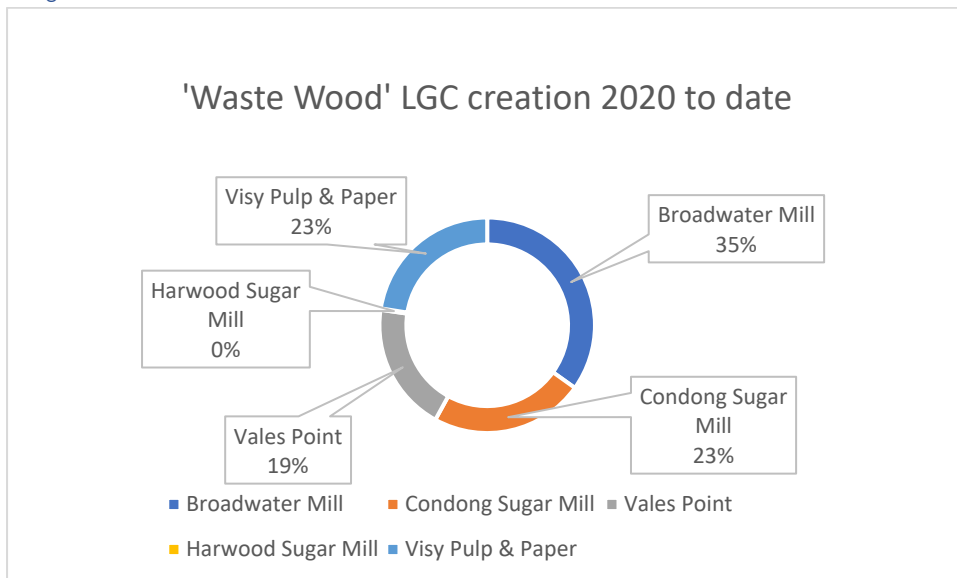


Diagram 5



#### 4. What biomass fuel sources are the big sugar mills using in NSW?

Bagasse does not comprise a majority (greater than 50%) fuel source at the three sugar mills in NSW, although it is the largest fuel source in the mix used by the three mills in aggregate.

This year (to date), bagasse is only the third largest fuel source at the sugar mills, which may be an artifact of the seasonal nature of bagasse production, but it could also be a reflection of the growing use of energy crops (the largest fuel source in 2020) and 'wood waste' (the second largest).

Wood waste and 'energy crops' are growing fuel sources at Broadwater and Condong mills.

The use of 'energy crops' at Condong Mill is concerning if the crop being burned is sugar cane. This would indicate that the sugar cane crop is becoming more viable as fuel source than for sugar production, which would lead to questions about the viability of the mill and the validity of subsidising 'energy crops' under the RET if it is leading to food crops being repurposed in this way.

At the Broadwater mill last year, 'wood waste' was the largest fuel source, having overtaken bagasse by a small margin.

Table 5 – Aggregate of three sugar mill fuel sources for biomass LGCs

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020 to date
Bagasse	136,494	75,115	107,886	37,128	209,346	162,251	195,853	129,496	160,859	192,905	36,672
Wood waste	79,150	44,304	37,574	24,237	70,559	56,772	89,874	118,513	87,587	103,915	76,850
MSW	4,672	1,419	114	0	0	7,531	16,181	28,470	46,706	20,272	0
Energy crops	1,077	1,786	128	1,398	17,783	21,546	22,472	37,483	78,844	69,869	73,375
TOTAL	221,393	122,624	145,702	62,763	297,688	248,100	324,380	313,962	373,996	386,961	186,897

Diagram 6

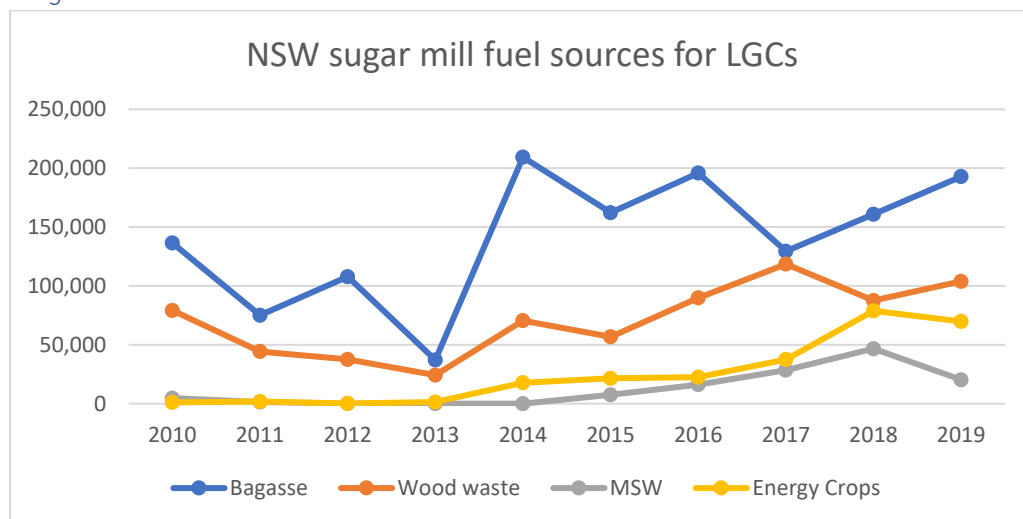


Diagram 7

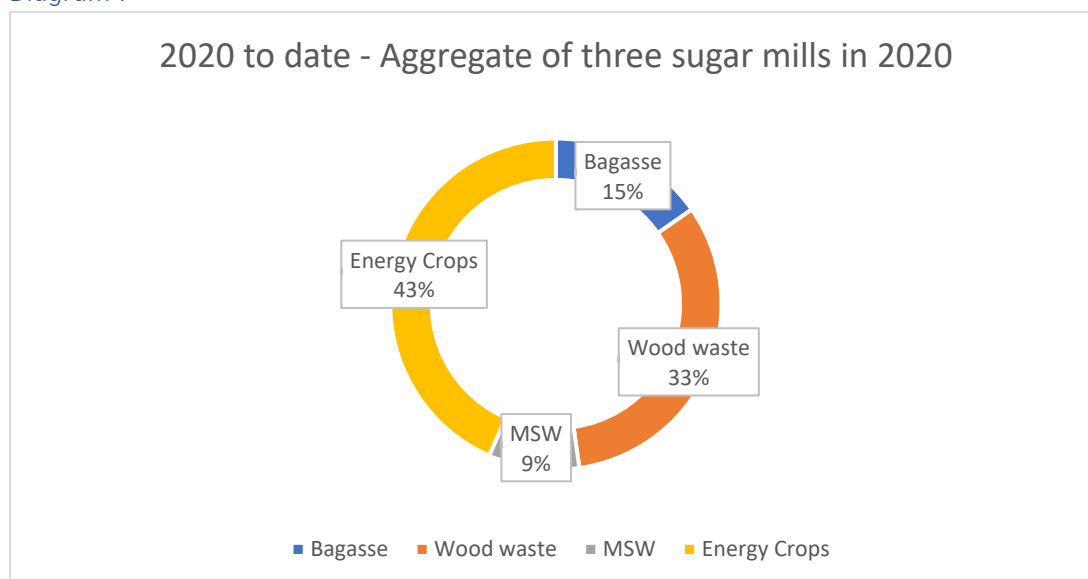


Table 3 – Broadwater Mill fuel sources for biomass LGCs

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020 to date
Bagasse	69,583	48,391	71,738	26,172	127,555	95,912	113,683	72,236	92,570	68,984	14,938
Wood waste	20,589	19,188	19,154	10,430	39,382	38,750	54,037	74,471	47,529	69,377	46,041
MSW	0	0	0	0	0	0	0	3,793	20,141	3,496	0
Energy crops	1,077	1,786	128	1,398	12,493	21,284	12,835	18,363	30,395	40,709	38,698
TOTAL	91,249	69,365	91,020	38,000	179,430	155,946	180,555	168,863	190,635	141,857	99,677

Table 4 – Condong Sugar Mill fuel sources for biomass LGCs

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020 to date
Bagasse	66,911	24,321	34,048	10,956	81,791	66,339	79,610	54,051	65,498	121,111	20,966
Wood waste	58,561	24,592	17,717	13,807	31,177	18,022	35,604	43,377	39,345	33,910	30,530
MSW	4,672	1,419	114	0	0	7,531	16,181	24,677	26,565	16,776	0
Energy crops	0	0	0	0	5,290	262	9,637	19,120	48,449	69,869	34,677
TOTAL	130,144	50,332	51,879	24,763	118,258	92,154	141,032	141,225	179,857	241,666	86,173

Table 5 – Harwood Mill fuel sources for biomass LGCs

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020 to date
Bagasse	0	2,403	2,100	0			2,560	3,209	2,791	2,810	768
Wood waste	0	524	703	0	0	0	233	665	713	628	279
MSW	0	0	0	0	0	0	0	0	0	0	0
Energy crops	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	2,927	2,803	0	0	0	2,793	3,874	3,504	3,438	1,047

## Appendix 1: Register of NSW Accredited Power Stations for bagasse and 'wood waste'<sup>4</sup>

Nominated person (account name)	Power station name	Accreditation Code	Fuel Source	Power station suspension status
AGL Macquarie Pty Limited	Bayswater Power Station	BEBMNS02	Wood waste Municipal solid waste combustion^ Biomass-based components of municipal solid waste	Unsusended
AGL Macquarie Pty Limited	Liddell Power Station	BEBMNS01	Waste from processing of agricultural products Municipal solid waste combustion^ Wood waste Food and agricultural wet waste^ Biomass-based components of municipal solid waste	Unsusended
Big River Timbers Pty Ltd	Big River Timbers ww Grafton	BEBMNS09	Wood waste	Susended
Cape Byron Management Pty Ltd	Broadwater Mill	BEBMNS06	Waste from processing of agricultural products Bagasse Wood waste Energy crops Biomass-based components of municipal solid waste	Unsusended
Cape Byron Management Pty Ltd	Condong Sugar Mill	BEBMNS07	Waste from processing of agricultural products Bagasse Wood waste Energy crops Biomass-based components of municipal solid waste	Unsusended
EnergyAustralia NSW Pty Ltd	Mt Piper Power Station	BEBMNS08	Wood waste Municipal solid waste combustion^ Biomass-based components of municipal solid waste	Unsusended
EnergyAustralia NSW Pty Ltd	Wallerawang Power Station	BEBMNS03	Wood waste Municipal solid waste combustion^ Biomass-based components of municipal solid waste	Susended

<sup>4</sup> <https://www.rec-registry.gov.au/rec-registry/app/public/power-station-registry> accessed 23 August 2020



Nominated person (account name)	Power station name	Accreditation Code	Fuel Source	Power station suspension status
NSW Sugar Milling Co-operative Limited	Harwood Mill	BEBMNS05	Bagasse Wood waste Bagasse co-generation^	Unsuspending
Sunset Power International Pty Ltd	Vales Point	BEBMNS04	Wood waste Municipal solid waste combustion^ Biomass-based components of municipal solid waste	Unsuspending
Visy Pulp and Paper Pty Ltd	Visy Pulp and Paper	BEBLNS01	Waste from processing of agricultural products Wood waste Black liquor Energy crops	Unsuspending

## Appendix 2 – Energy Sources used by Accredited Power stations

In the table below, I have highlighted the fuel sources that are burned in biomass burners. It's possible I may have mistaken some biogas fuel sources for biomass burner fuel sources.

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A list of accredited power stations is available on the [Register of accredited power stations](#).

The following table lists the 19 eligible categories for renewable energy sources as outlined in the REE Act:

Renewable power station energy sources
Hydro
Wave
Tide
Ocean
Wind
Solar
Geothermal-aquifer
Hot dry rock
Energy crops

<sup>5</sup> <http://www.cleanenergyregulator.gov.au/RET/Scheme-participants-and-industry/Power-stations/Eligibility-criteria/eligible-energy-sources>

## Renewable power station energy sources

Wood waste

Agricultural waste

Waste from processing of agricultural products

Food waste

Food processing waste

Bagasse

Black liquor

Biomass-based components of municipal solid waste

Landfill gas

Sewage gas and biomass based components of sewage