Australasian (iron and steel) Slag Association Inc.

Membership Annual Survey Results

January to December 2017

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The Australasian (iron & steel) Slag Association (ASA) conducts an annual survey for information regarding iron & steel slag (ISS) production and value-added sale of slag quantities by members and non-members for each calendar year. This report, compiled during 2018, reports on industry members[1] and non-members' ISS production, importation and sales for the calendar period 2017.

Information provided by members and non-members is reviewed, compared, collated and aggregated into a national set of results and includes ISS production levels by nominated uses for all slag products.

For the calendar period January to December 2017, some 2.521 million tonnes (Mt) of iron and steel slag produced nationally, combined with imported ISS from overseas sources, was used within various sectors. Compared with 2016, there was a modest increase of approximately 70,000 metric tonnes of slag used within select markets.

The ongoing increase in the volume of ISS and slag utilisation continues to correlate well with demand for steel and the increased road and infrastructure spending by the Australian Government, in particular within the streams of steel production for BOS and EAF processes. However, a minor reduction in demand for granulated blast furnace slag (GBFS) within the cement and concrete sectors has meant that GBFS use has decreased some 80,000 tonnes over the period. For the reported period, GBFS was from either domestic sources or imported mainly from Japan.

From the 2.774 Mt available, 2.521 Mt or 91% of ISS produced was effectively utilised within various value-added civil and construction material applications throughout Australasia.

The survey results include all generators, (iron & steel plants) marketers, (processing and marketing companies) and users for the total production and resulting sales by each end use. Where required, data is supplemented with importation data[2] and other secondary data sources for accuracy purposes.

The key results for the calendar period 2017 survey were:

- Approximately 2.774 Mt (million tonnes) of iron and steel slag was available for use within Australasia (Australia and New Zealand).
- From the ISS available, 2.521 Mt or 91% was effectively utilised [sold or reused for some beneficial use].
- On a per capita basis, this equates to 105 kgs per person recycled or reused for 2017.

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[1] http://www.asa-inc.org.au/membership/members-and-affiliates

[2] ABS [Austats] based on import tariff code for Granulated Blast Furnace Slag (GBFS).

- 60% or 1.51 Mt was used in cementitious applications - "high value add" [HVA][3] Note: approx. 0.912 Mt of GBFS was imported.
- 30% or 0.775 Mt was used in non-cementitious or road construction applications - medium value add [MVA][4].
- 10% or 0.236 Mt was in general civil or fill applications – low value add [LVA][5].

In summary, the longer-term trend of ISS materials end use applications has stabilised its movement towards HVA away from LVA applications. To this end, the active recovery and use of ISS continues to provide significant positive environmental impacts, including resource conservation and in this case, the reduction of greenhouse gas emissions from the processing of virgin resources.

Table 1 provides more detail for individual category sales of ISS for the period 2017 with comparisons against 2016, 2015, 2014, 2013, 2012, 2011, 2010, 2009 and 2008.

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[3] HVA – High Value Add – means where ISS materials are sold for > (more than) $100/tonne
[4] MVA – Medium Value Add – means where ISS materials are sold for between $10-$100/tonne
[5] LVA – Low Value Add – means where ISS materials are sold for < (less than) $10/tonne

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2017 Slag Production & Sales Survey

SECTION A Slag Beneficial Use Calculations (mt)	BFS	GBFS	SFS	EAFS	KOBM	Other	2017 Combined	2016 Combined	2015 Combined	2014 Combined
A1. Total Produced in 2017 (Jan-Dec)	550,635	531,000	381,439	127,292	50,000	198,476	1,838,842	1,885,481	1,889,246	1,927,688
A2. Total imported in 2017 (Jan-Dec)		912,630					912,630	1,101,099	1,006,980	968,585
A3. Total Stored [not used]	0	0	0	18,453	0	0	18,453	25,800	0	382,746
A4. Total Removed from Storage during 2014	0	0	0	4,794	0	0	4,794	25,800	0	100,020
SECTION B Auto Calculations							**Combined**	**Combined**	**Combined**	**Combined**
B2. Total for use in 2017 (Auto calc)	550,635	1,443,630	381,439	150,539	50,000	198,476	2,774,719	3,012,380	2,896,226	2,996,293
SECTION C Slag Use (mt)	**BFS**	**GBFS**	**SFS**	**EAFS**	**KOBM**	**Other**	**Combined**	**Combined**	**Combined**	**Combined**
C1. Cement or Binder products	0	1,508,340	0	0	0	0	1,508,340	1,587,686	1,479,762	1,521,496
C2. Feed stock for Clinker/Glass products	21,388	21,388	52,101	0	0	0	94,878	88,919	126,645	56,154
C2. Grit Blasting products	0	0	0	0	0	0	0	0	0	0
C2. Structural Fills/Embankments	0	0	12,646	0	0	0	12,646	14,317	13,260	13,260
C2. Road Base/Sub-base	112,750	20,567	90	49,739	0	138,163	321,309	219,432	122,728	122,728
C2. Rockwool products	0	0	0	0	0	0	0	0	0	0
C2. Mineral Fillers (e.g Asphalt)	0	0	0	0	0	0	0	0	0	0
C2. Agricultural applications	0	0	0	0	0	0	0	0	275	275
C2. Water treatment/filtration products	0	0	0	0	0	0	0	0	0	0
C2. Asphalt & Concrete Aggregates	253,524	0	75,271	18,755	0	0	347,549	301,429	335,347	335,347
C3. Mining Applications	0	0	0	0	0	0	0	0	0	0
C3. Waste Stabilisation/Solidification	0	0	0	0	0	0	0	0	0	0
C3. Miscellaneous/Other	8,742	7,952	144,205	4,731	50,000	20,893	236,523	236,198	294,965	294,965
SECTION D Summary Results	**BFS**	**GBFS**	**SFS**	**EAFS**	**KOBM**	**Other**	**Combined**	**Combined**	**Combined**	**Combined**
D1. Total of all sold in 2017 (Auto calc)	396,405	1,558,247	284,313	73,225	50,000	159,056	2,521,245	2,447,981	2,372,982	2,344,225
	71.99%	107.94%	74.54%	48.64%	100.00%	80.14%	90.86%	94.64%	95.06%	89.70%

Table 1 - 2017 Slag Sales and Production Survey