Australasian (iron and steel) Slag Association Inc.

Membership Annual Survey Results

January to December 2018

Prepared by
HBM Group Pty Ltd

Summary

For the calendar period January to December 2018, 3.069 million tonnes (Mt) of iron and steel slag (ISS) produced nationally, combined with imported ISS from overseas sources. During this period 2.372 million tonnes or 78% of ISS was beneficially used within the construction materials sector; resulting in the conservation of; energy; finite natural resources, the reduction of carbon emissions from these co-products.

Methodology

Annually the Australasian (iron & steel) Slag Association (ASA) survey's its members and non-members regarding ISS production and value-added applications for the calendar year. This report, compiled during 2019, reports on members[1] and non-members; (1) production, (2) importation and (3) sales for 2018.

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.

Information provided is reviewed, compared, collated before being aggregated into this national report by slag type; BFS; GBFS; SFS; EAFS; KOBM; Others[3] and by end uses for all slag products.

Discussion of results

The ongoing increase in the volume of ISS and slag utilisation continues to correlate well with demand for steel within the construction and infrastructure sectors, underpinned by major investments by State Governments, in particular within the streams of steel production for BOS and EAF processes.

Demand for granulated blast furnace slag (GBFS) within the cement and concrete sectors has meant that GBFS use has increased some 120,000 tonnes over the period. For the reported period, GBFS imports increased by 90,000 tonnes.

From the 3.069 Mt generated and imported, 2.372 Mt or 78% was effectively utilised within various value-added civil and construction material applications throughout Australasia.

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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).
[3] http://www.asa-inc.org.au/products

The key results for the calendar period 2018 survey were:

- Approximately 3.069 Mt (million tonnes) of iron and steel slag was available for use within Australasia (Australia and New Zealand)
- From the ISS available, 2.372 Mt or 78% was effectively utilised [sold or reused for some beneficial use]
- On a per capita basis, this equates to 94 kgs per person used in 2018
- 68% or 1.624 Mt was used in cementitious applications - "high value add" [HVA][4] Note: approx. 1.107 Mt of GBFS was imported.
- 26% or 0.592 Mt was used in non-cementitious or road construction applications - medium value add [MVA][5].
- 6% or 0.154 Mt was in general civil or fill applications – low value add [LVA][6].

In summary, the longer-term trend of ISS materials end use applications continues its movement towards HVA away from LVA applications. To this end, the active use of these co-products 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 periods; 2018; with comparisons against 2017 to 2014.

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

Australasian (iron & steel) Slag Association

2018 Slag Production & Sales Survey

SECTION A Slag Beneficial Use Calculations (mt)	BFS	GBFS	SFS	EAFS	KOBM	Other	2018 Combined	2017 Combined	2016 Combined	2015 Combined	2014 Combined
A1. Total Produced in 2018 (Jan-Dec)	569,527	511,000	391,594	150,088	39,500	245,800	1,907,509	1,838,842	1,885,481	1,889,246	1,927,688
A2. Total imported in 2018 (Jan-Dec)		1,107,098					1,107,098	912,630	1,101,099	1,006,980	968,585
A3. Total Stored [not used]	0	0	0	0	0	0	0	18,453	25,800	0	382,746
A4. Total Removed from Storage during 2018	0	55,000	0	0	0	0	55,000	4,794	25,800	0	100,020
SECTION B Auto Calculations							**Combined**	**Combined**	**Combined**	**Combined**	**Combined**
B2. Total for use in 2018 (Auto calc)	569,527	1,673,098	391,594	150,088	39,500	245,800	3,069,606	2,756,266	3,012,380	2,896,226	2,996,293
SECTION C Slag Use (mt)	**BFS**	**GBFS**	**SFS**	**EAFS**	**KOBM**	**Other**	**Combined**	**Combined**	**Combined**	**Combined**	**Combined**
C1. Cement or Binder products	0	1,624,576	0	0	0	0	1,624,576	1,508,340	1,587,686	1,479,762	1,521,496
C2. Feed stock for Clinker/Glass products	22,898	22,898	42,566	0	0	0	88,362	94,878	88,919	126,645	56,154
C2. Grit Blasting products	0	0	0	0	0	0	0	0	0	0	0
C2. Structural Fills/Embankments	0	0	12,502	0	0	0	12,502	12,646	14,317	13,260	13,260
C2. Road Base/Sub-base	106,023	18,968	0	54,451	0	13,459	192,901	321,309	219,432	122,728	122,728
C2. Rockwool products	0	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	0
C2. Agricultural applications	0	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	0
C2. Asphalt & Concrete Aggregates	210,362	0	71,350	17,513	0	0	299,225	347,549	301,429	335,347	335,347
C3. Mining Applications	0	0	0	0	0	0	0	0	0	0	0
C3. Waste Stabilisation/Solidification	0	0	0	0	0	0	0	0	0	0	0
C3. Miscellaneous/Other	8,724	4,917	105,704	8,252	0	26,849	154,446	236,523	236,198	294,965	294,965
SECTION D Summary Results	**BFS**	**GBFS**	**SFS**	**EAFS**	**KOBM**	**Other**	**Combined**	**Combined**	**Combined**	**Combined**	**Combined**
D1. Total of all sold in 2018 (Auto calc)	348,007	1,671,359	232,122	80,216	0	40,308	2,372,012	2,521,245	2,447,981	2,372,982	2,344,225
	61.10%	99.90%	59.28%	53.45%	0.00%	16.40%	77.27%	94.64%	94.64%	95.06%	89.70%

Table 1 - 2018 Slag Sales and Production Survey