Australalasian (iron and steel) Slag Association Inc.

Membership Annual Survey Results

January to December 2011

Prepared by
HBM Group Pty Ltd

The Australasian (iron & steel) Slag Association (ASA) conducts an annual survey for information regarding iron & steel slag (ISS) production and value added sold quantities by members and non-members for each calendar year. This report compiled during 2012 provides results for the 2011 calendar year.

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

For the calendar period January to December 2011, some 3.4 million tonnes (Mt) ISS was generated nationally or imported and used by various industry sectors. Compared with 2010, there was an increase of approximately 800,000 tonnes. This increased volume of ISS production resulted from an increased 200,000 generated nationally with some 600,000 of Granulated Blast Furnace Slag imported for use by the cement and concrete industries.

From the 3.4 Mt available, 3.2 Mt or 93% 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[1] and other secondary data[2] sources for accuracy purposes.

The key results for the calendar period 2011 survey were:

- Approximately 3.4 Mt (million tonnes) of iron and steel slag products were produced within Australasia (Australia and New Zealand).
- From the ISS produced, some 3.2 Mt or 93% has been effectively utilised [sold or reused for some beneficial use].
- On per capita basis, this equates to 145 kgs per person recycled or reused
- 33% or 1.05 Mt was used in cementitious applications - "high value add" [HVA][3] Note: approx 0.612 Mt of GBFS was imported.
- 53% or 1.7 Mt was used in non-cementitious or road construction applications - medium value add [MVA][4].
- 14% or 0.48 Mt was in general civil or fill applications – low value add [LVA] [5].

In summary, the recovery and reuse 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.

---

[1] ABS [Austats] based on import tariff code for Granulated Blast Furnace Slag (GBFS).
[2] Company annual reports and other published data sources.
[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.

The following table provides more detail for individual category sales of ISS for the period 2011 with comparisons against 2010[6], 2009 and 2008.

Australasian (iron & steel) Slag Association
2011 Slag Production & Sales Survey

SECTION A Slag Beneficial Use Calculations (mt)	BFS	GBFS	SFS	EAFS	KOBM	Other	2011 Combined	2010 Combined	2009 Combined	2008 Combined
A1. Total Produced in 2011 (Jan-Dec)	1,447,888	443,000	573,004	128,904	46,264	222,858	2,861,918	2,399,883	2,941,079	3,157,222
A2. Total imported in 2011 (Jan-Dec)		612,662					612,662	449,129	384,250	249,100
A3. Total Stored [not used]	218,720	0	0	16,827	0	0	235,547	470,472	843,438	695,766
A4. Total Removed from Storage during 2011	0	0	24,330	112,086	0	31,463	167,879	295,814	0	0
SECTION B Auto Calculations							**Combined**	**Combined**	**Combined**	**Combined**
B2. Total Used in 2011 (Auto calc)	1,229,168	1,055,662	597,334	224,163	46,264	254,321	3,406,912	2,674,354	3,414,107	3,406,322
SECTION C Slag Use (mt)	**BFS**	**GBFS**	**SFS**	**EAFS**	**KOBM**	**Other**	**Combined**	**Combined**	**Combined**	**Combined**
C1. Cement or Binder products	0	1,055,662	0	0	0	0	1,055,662	871,394	561,529	671,153
C2. Feed stock for Clinker/Glass products	8,406	0	20,132	0	0	0	28,538	16,778	57,270	65,547
C2. Grit Blasting products	0	0	0	0	0	0	0	0	0	0
C2. Structural Fills/Embankments	450,478	0	0	37,850	0	35,914	524,242	22,119	388,443	14,443
C2. Road Base/Sub-base	75,070	9,563	203,894	43,404	0	77,891	409,822	405,636	522,967	604,421
C2. Rockwool products	2,817	0	0	688	0	0	3,505	2,766	2,000	11,719
C2. Mineral Fillers (e.g Asphalt)	0	0	0	0	0	22,012	22,012	28,199	38,730	31,182
C2. Agricultural applications	0	0	0	115	0	0	115	0	611	611
C2. Water treatment/filtration products	0	0	0	112	0	29,205	29,317	29,205	25,643	25,793
C2. Asphalt & Concrete Aggregates	508,744	0	114,087	30	0	7,416	630,277	710,014	677,585	887,092
C3. Mining Applications	0	0	0	0	0	0	0	22,484	53,384	35,493
C3. Waste Stabilisation/Solidification	0	0	0	0	3,758	0	3,758	3,758	7,137	7,137
C3. Miscellaneous/Other	301,826	70,776	101,147	0	3,198	0	476,947	234,097	235,370	355,965
SECTION D Summary Results	**BFS**	**GBFS**	**SFS**	**EAFS**	**KOBM**	**Other**	**Combined**	**Combined**	**Combined**	**Combined**
D1. Total of all sold in 2011 (Auto calc)	1,347,341	1,136,002	439,259	82,199	6,956	172,438	3,184,195	2,346,451	2,570,669	2,710,556
	109.61%	107.61%	73.54%	36.67%	15.04%	67.80%	93.46%	87.74%	75.30%	79.57%

Table 1 - 2011 Slag Sales and Production Survey

Australasian (iron & steel) Slag Association
December, 2012

[6] Generated volumes during 2010 were low due to closer of No 5 Blast Furnace for maintenance.