



## **Australasian (iron and steel) Slag Association Inc.**

### **Membership Annual Survey Results**

**January to December 2013**

Prepared by  
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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 sold quantities by members and non-members for each calendar year. This report compiled during 2014 reports on industry member and non-member production, importation and sales results for the calendar period 2013.

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 2013, some 2.88 million tonnes (Mt) ISS was generated by major steel makers nationally or imported from overseas sources and used within various industry sectors. Compared with 2012, there was second year decrease of approximately 150,000 metric tonnes.

This decrease in volume of ISS correlates well with current depressed domestic demand for steel, in particular in the steams of steel production within the BOS and EAF processes. Conversely the high demand for granulated blast furnace slag (GBFS) continues within the cement and concrete sectors again increasing some 300,000 tonnes over the period. For the reported period 38% of GBFS was from domestic sources vis 62% of GBFS from imported Japan.

From the 2.88 Mt available, 2.5 Mt or 86% 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<sup>1</sup> and other secondary data<sup>2</sup> sources for accuracy purposes.

The key results for the calendar period 2013 survey were:

- Approximately 2.88 Mt (million tonnes) of iron and steel slag products were produced within Australasia (Australia and New Zealand).
- From the ISS produced, some 2.5 Mt or 86% has been effectively utilised [sold or reused for some beneficial use].
- On per capita basis, this equates to 113 kgs per person recycled or reused for 2013
- 59% or 1.49 Mt was used in cementitious applications - “high value add” [HVA]<sup>3</sup> Note: approx 0.82 Mt of GBFS was imported.
- 29% or 0.72 Mt was used in non-cementitious or road construction applications - medium value add [MVA]<sup>4</sup>.
- 12% or 0.26 Mt was in general civil or fill applications – low value add [LVA]<sup>5</sup>.

<sup>1</sup> ABC [Australia] based on import tariff code for Granulated Blast Furnace Slag (GBFS) from China per kg of slag.

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In summary the longer-term trend of ISS materials continues moving 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 2013 with comparisons against 2012, 2011, 2010<sup>6</sup>, 2009 and 2008.

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<sup>6</sup> Generated volumes during 2010 were low due to closer of No 5 Blast Furnace for maintenance.

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## Australasian (iron & steel) Slag Association

### 2013 Slag Production & Sales Survey

| SECTION A<br>Slag Beneficial Use Calculations (mt) | BFS       | GBFS      | SFS     | EAFS   | KOBM   | Other   | 2013<br>Combined | 2012<br>Combined | 2011<br>Combined | 2010<br>Combined | 2009<br>Combined | 2008<br>Combined |
|--|-----------|-----------|---------|--------|--------|---------|------------------|------------------|------------------|------------------|------------------|------------------|
| A1. Total Produced in 2013 (Jan-Dec)               | 1,014,672 | 503,000   | 497,700 | 92,449 | 50,000 | 271,329 | 2,429,150        | 2,529,541        | 2,861,918        | 2,399,883        | 2,941,079        | 3,157,222        |
| A2. Total imported in 2013 (Jan-Dec)               |           | 820,049   |         |        |        |         | 820,049          | 684,033          | 612,662          | 449,129          | 384,250          | 249,100          |
| A3. Total Stored [not used]                        | 242,814   | 0         | 141,260 | 27,638 | 0      | 9,329   | 421,041          | 617,707          | 235,547          | 470,472          | 843,438          | 695,766          |
| A4. Total Removed from Storage during 2011         | 38,000    | 0         | 0       | 0      | 0      | 13,933  | 51,933           | 426,349          | 167,879          | 295,814          | 0                | 0                |
| SECTION B<br>Auto Calculations                     |           |           |         |        |        |         | Combined         | Combined         | Combined         | Combined         | Combined         | Combined         |
| B2. Total Used in 2013 (Auto calc)                 | 809,858   | 1,323,049 | 356,440 | 64,811 | 50,000 | 275,933 | 2,880,090        | 3,022,216        | 3,406,912        | 2,674,354        | 3,414,107        | 3,406,322        |
| SECTION C<br>Slag Use (mt)                         | BFS       | GBFS      | SFS     | EAFS   | KOBM   | Other   | Combined         | Combined         | Combined         | Combined         | Combined         | Combined         |
| C1. Cement or Binder products                      | 38,891    | 1,452,845 | 0       | 0      | 0      | 0       | 1,491,736        | 1,135,569        | 1,055,662        | 871,394          | 561,529          | 671,153          |
| C2. Feed stock for Clinker/Glass products          | 8,671     | 17,165    | 88,269  | 0      | 0      | 0       | 114,105          | 46,820           | 28,538           | 16,778           | 57,270           | 65,547           |
| C2. Grit Blasting products                         | 0         | 0         | 0       | 0      | 0      | 0       | 0                | 0                | 0                | 0                | 0                | 0                |
| C2. Structural Fills/Embankments                   | 0         | 0         | 0       | 0      | 0      | 0       | 0                | 689,215          | 524,242          | 22,119           | 388,443          | 14,443           |
| C2. Road Base/Sub-base                             | 64,776    | 12,548    | 89,737  | 36,184 | 0      | 0       | 203,245          | 241,475          | 409,822          | 405,636          | 522,967          | 604,421          |
| C2. Rockwool products                              | 0         | 0         | 0       | 0      | 0      | 0       | 0                | 1,430            | 3,505            | 2,766            | 2,000            | 11,719           |
| C2. Mineral Fillers (e.g Asphalt)                  | 0         | 0         | 0       | 0      | 0      | 0       | 0                | 4,291            | 22,012           | 28,199           | 38,730           | 31,182           |
| C2. Agricultural applications                      | 0         | 0         | 421     | 0      | 0      | 0       | 421              | 0                | 115              | 0                | 611              | 611              |
| C2. Water treatment/filtration products            | 0         | 0         | 0       | 0      | 0      | 0       | 0                | 56               | 29,317           | 29,205           | 25,643           | 25,793           |
| C2. Asphalt & Concrete Aggregates                  | 300,646   | 0         | 87,906  | 19,224 | 0      | 0       | 407,776          | 428,385          | 630,277          | 710,014          | 677,585          | 887,092          |
| C3. Mining Applications                            | 0         | 0         | 0       | 0      | 0      | 0       | 0                | 0                | 0                | 22,484           | 53,384           | 35,493           |
| C3. Waste Stabilisation/Solidification             | 0         | 0         | 0       | 0      | 0      | 0       | 0                | 0                | 3,758            | 3,758            | 7,137            | 7,137            |
| C3. Miscellaneous/Other                            | 53,760    | 61,223    | 121,332 | 3,452  | 0      | 19,933  | 259,700          | 241,838          | 476,947          | 234,097          | 235,370          | 355,965          |
| SECTION D<br>Summary Results                       | BFS       | GBFS      | SFS     | EAFS   | KOBM   | Other   | Combined         | Combined         | Combined         | Combined         | Combined         | Combined         |
| D1. Total of all sold in 2013 (Auto calc)          | 466,745   | 1,543,781 | 387,666 | 58,859 | 0      | 19,933  | 2,476,983        | 2,789,080        | 3,184,195        | 2,346,451        | 2,570,669        | 2,710,556        |
|  | 57.63%    | 116.68%   | 108.76% | 90.82% | 0.00%  | 7.22%   | 86.00%           | 92.29%           | 93.46%           | 87.74%           | 75.30%           | 79.57%           |

Table 1 - 2013 Slag Sales and Production Survey