



Australian Foundry Institute

ABN 53 830 764 159

Industry Data Report

October 2021

**Details of a survey of the cast metal
industry of Australia.**

Compiled by –

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1.0 Executive Summary

The 2021 Metal Casting Industry Report is the continuation of the efforts begun in 2019 to summarise the scale of the industry in Australia and to capture some of the key metrics that impact on metal casting operations.

The data provided is intended to be used as an aid by anyone with an interest in the Australian metal casting industry.

The AFI National Council made the decision to continue with an annual survey and again there has been a slight expansion of the range of requests for data. The AFI National Council takes the view that this report more accurately represents our industry.

As in previous years, Non-Disclosure Agreements were signed when requested. However there still remain a small but significant number of metal casting businesses that are unwilling / unable to share data.

The 23 casting operations that have shared data with me, ensures that the report is representative of the metal casting industry in Australia. Again, I have also derived data, using publicly available information, from a further 35 metal casting operations.

The cast metal industry in Australia generates more than \$0.65 billion in sales annually, and directly employs 1483 people, including 36 trainees / apprentices.

The global pandemic has impacted on all areas of life and the metal casting industry has not been immune to this impact. Supply chain disruptions have resulted in both positive and negative outcomes for our industry. The negatives are most clearly seen with those metal casting operations that supply the global automotive industry. The 2 largest die casting operations in Australia have seen a 45% drop in production due to their reliance on the automotive industry. Other challenges for much of our industry remain similar to last year – access to trained personnel, training of personnel, significantly increasing risk in the supply and costs of materials and the pending tariff change in Queensland that will result in extraordinary increase in electricity costs for some metal casting businesses.

The positive outcomes are the increasing onshoring enquiries and steady order books for most businesses. This has been driven by concerns with supply chain disruption, instability in the Chinese-Australian relationship and a perceived need to build sovereign capability.

2.0 Background

The AFI National Council aim with this report is to more closely match the data represented in the IBIS C2121 Iron and Steel Casting in Australia June 2019 report and also the IBIS C2141 Non-Ferrous Casting report. There was a strong view aired at our October 2019 National Conference, that the IBIS reports did not accurately represent the reality for Australian metal casting operations.

The data requested in the 2021 industry survey continues this effort to better represent the Australian metal casting industry.

3.0 Survey Purpose and Overview

The purpose of the survey is to provide collated industry data on selected aspects of the Australian Cast Metal Industry.

3.1 Areas Addressed

The request for Industry Data has been mainly focussed on AFI member casting operations but does include data from non-AFI member companies.

Information requested covers Tonnage of metal cast (Ferrous and Non-ferrous), number of employee's, number of trainees and apprentices, power cost per kWh, new sand cost per Tonne, \$ value of annual casting sales, casting methods used, major market segments and cost structure by %.

Metal casting businesses were also asked to comment on the single biggest issue impacting on their operations.

3.2 Confidentiality Management

Confidentiality of the data supplied by individual casting operations continues to be of prime importance. As with the previous reports, all data was received and collated by myself only. As a long term, but now retired foundryman, I have no vested interest in any existing casting operations. Where requested a non-disclosure agreement has been signed. Only aggregated data is reported.

3.3 Survey Format

Appendix 1 shows a blank Data Request Form and the 2 related documents that were issued to casting operations through the various AFI State Secretaries.

3.4 Participant Feedback

A significant majority of AFI member metal casting operations were supportive of the process. A few were limited in the data that they could share. A total of 23 metal casting businesses gave me data. Using

publicly available information, I derived data for a further 35 metal casting businesses and included this data in this report.

3.5 Survey Timing

The initial communication requesting data was issued in February, 2021. Data was received over a wide time frame – from February 2021 through to October 2021. In some cases the data related to calendar year, for some financial year.

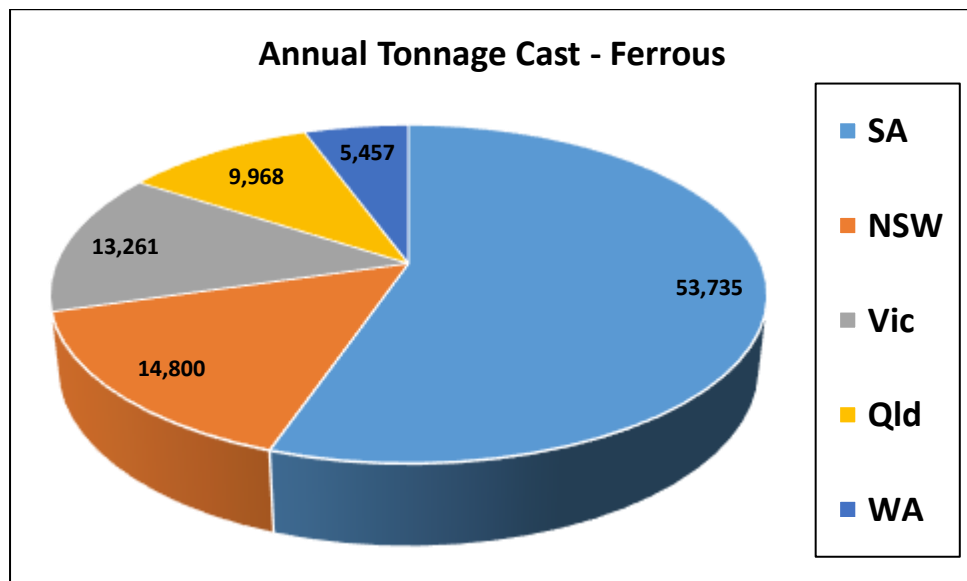
4.0 Survey Data – Statistics Summary

4.1 Annual Metal Tonnage – Ferrous and Non-Ferrous

18 respondents gave an annual Ferrous tonnage cast figure to which I added derived data for a further 11 foundries, giving a total 97,221 T of Ferrous metal cast annually.

This total represents a 3.3% decline from the total indicated in the 2020 Industry Report.

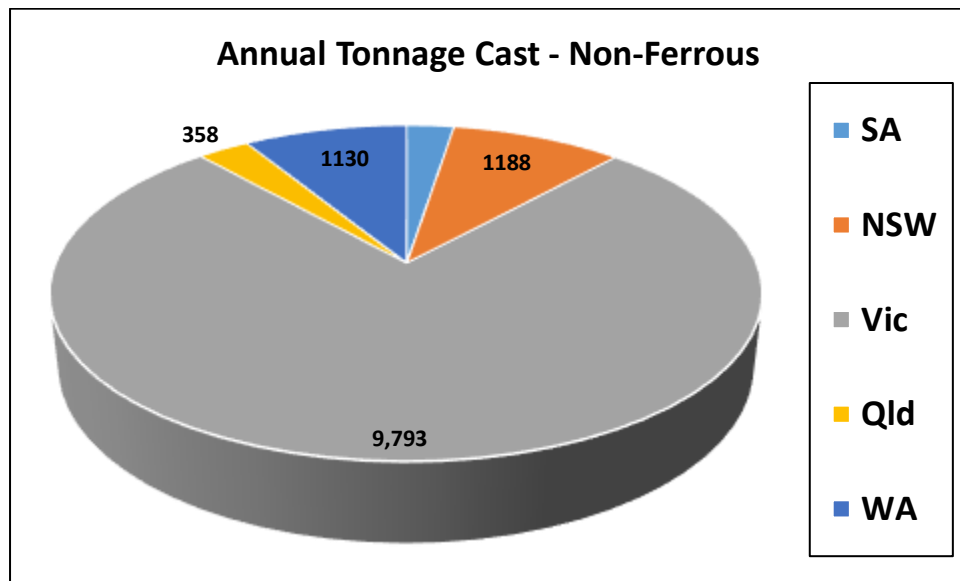
Note that this data covers what we define as a foundry, not the large continuous cast steel operations or the multiple metal refining operations.



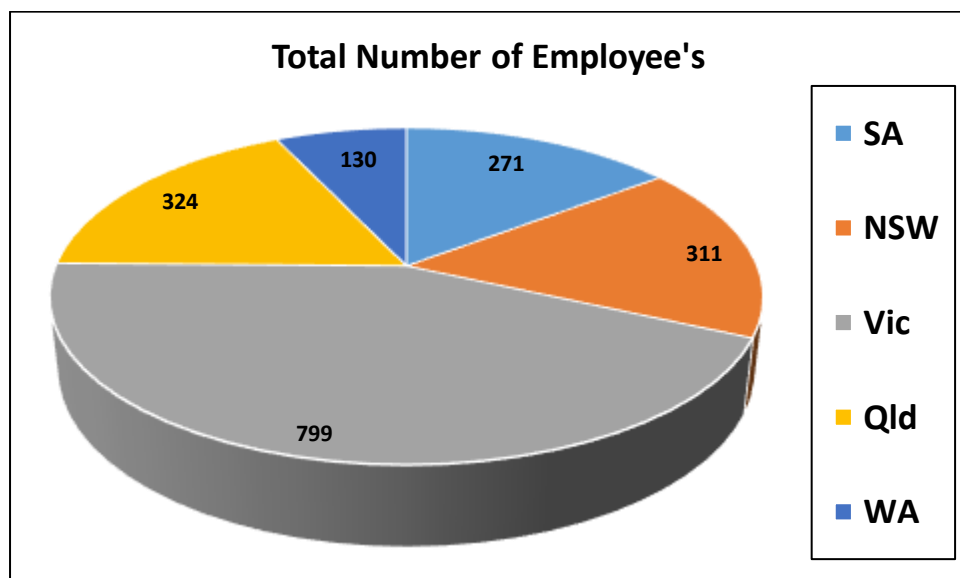
The Non-Ferrous data received from 11 respondents, along with data derived for a further 29 operations, gave a total of 12,796 T metal cast annually.

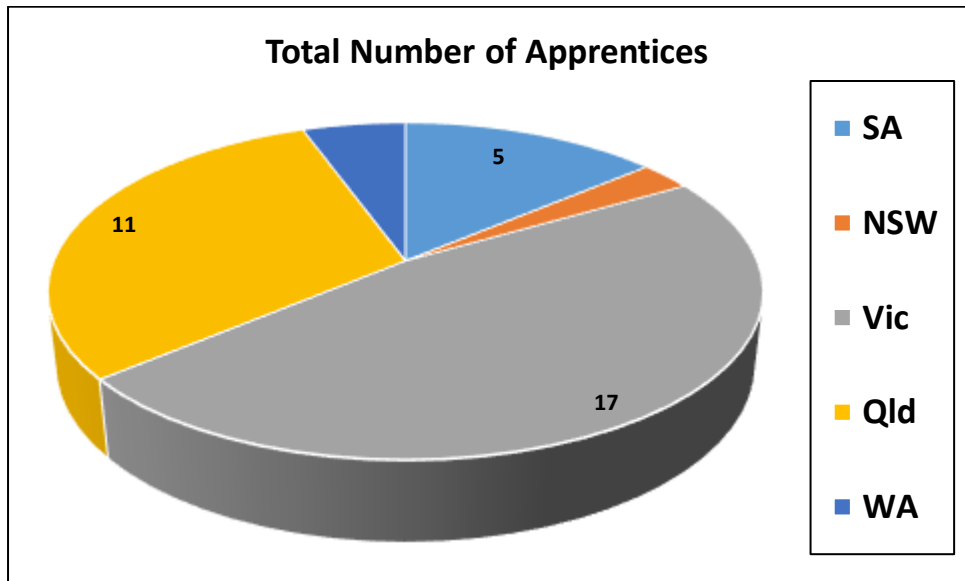
This figure does not include the annual tonnage from the major diecasting operations in Australia. I would consider that the total of Non-Ferrous metal cast in Australia would conservatively exceed 27,000 T pa, if data for the major diecasting operations was added to the total. This total figure is well down on the 2020 estimate, mainly

due to supply chain disruptions (silicon chips) in the automotive industry.



4.2 Number of Employees and Trainees / Apprentices
Combining received data (23 respondents) and derived data (35 operations) gave a directly employed number of 1483 employees and 36 trainees / apprentices. The majority of these trainees / apprentices are based in Queensland and Victoria.
This represents a 20% reduction over the 2020 figure. The bulk of this comes from the closing/downsizing of 2 of our larger metal casting operations.

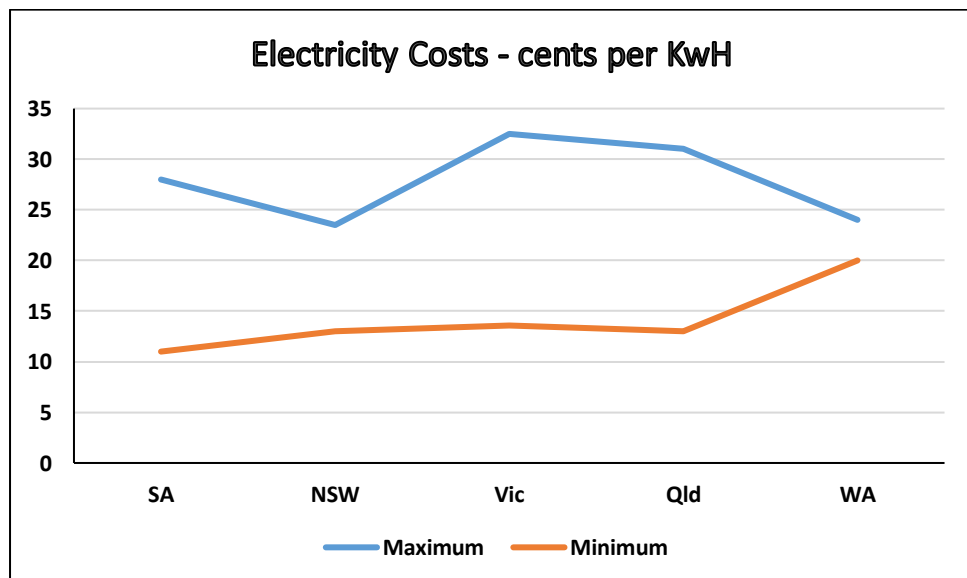




4.3 Energy Costs

Given the complexities involved with electricity bills, survey participants were asked to provide electricity cost per Kwh, ie total costs associated with electricity provision divided by total kWh's consumed. The aim was to have a directly comparable metric for all metal casting operations. For some integrated businesses it is difficult to split out this cost specific to their casting related activity.

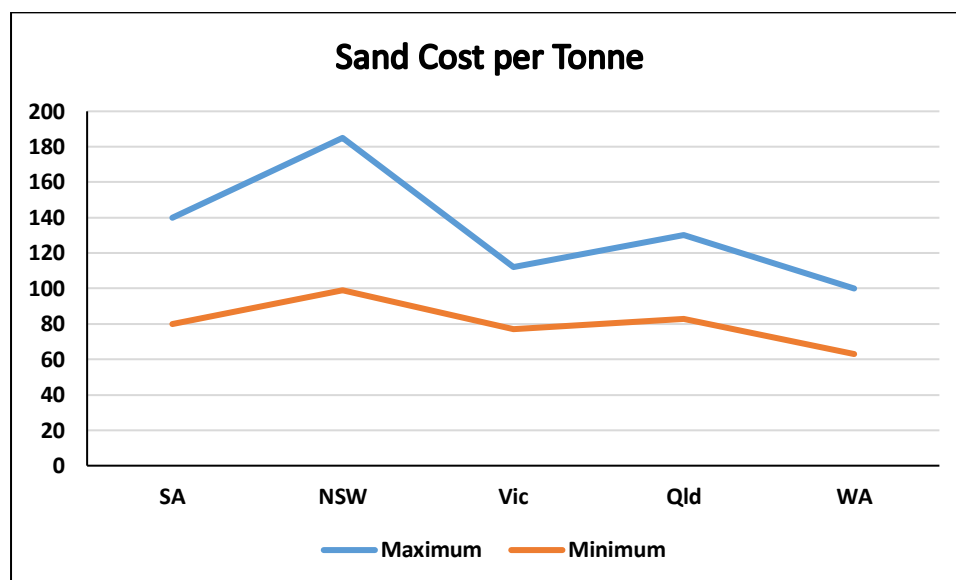
The 22 responses indicate a range of \$0.11 to \$0.32 / Kwh.



4.4 Sand Costs

Survey participants were asked to provide sand costs and identify type of sand purchased. The 22 responses gave cost per Tonne for silica over a range of sizes. Some also provided costs for chromite and synthetic sand.

Silica sand data is represented in the chart below.



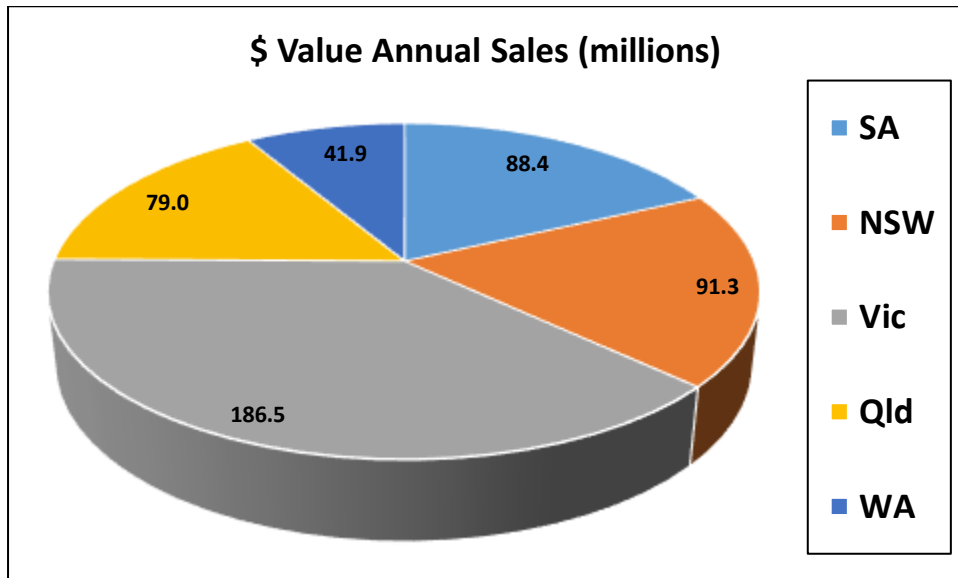
Chromite sand cost ranged from a minimum of \$662 / T to \$1200 / T. Synthetic sand cost ranged from \$1400 to \$2400 / T.

4.5 Annual Sales

Survey participants were asked to provide the \$ value of annual sales of castings. This calculation is made more complex by the fact that many casting operations also have considerable value-add processing post-casting (eg: machining, assembly, painting).

The chart below represents data received from 23 respondents plus my derived estimate for a further 13 metal casting businesses.

The total of \$487.4 million represents a significant decrease on the \$591.4 million reported in the 2021 Industry report. The bulk of this decrease would be due to the supply chain disruption to the global automotive industry.



4.6 Casting Method

Survey participants were asked to identify the casting method used. Hard sand, Greensand and Die casting were reported as the dominant cast methods with Investment Casting, Shell Mould, and Continuous Casting also reported.

We did not ask for a breakdown of tonnage cast for each casting method used.

4.7 Market Segments

Survey participants were asked to identify the major market segments that they supply.

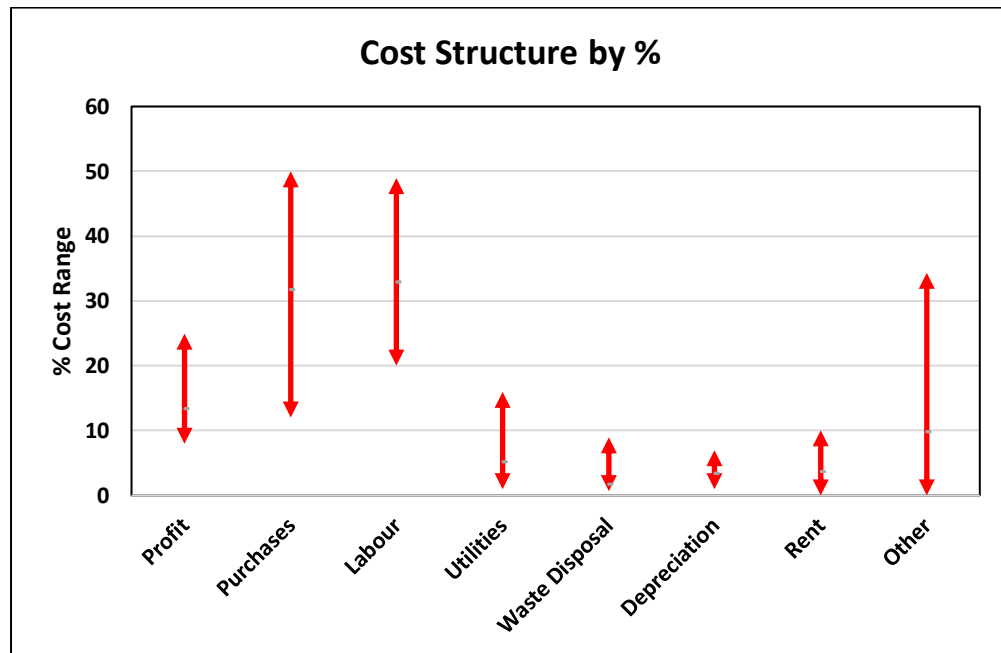
Not surprisingly, the respondents indicated a customer base covering a very diverse range of industries. I am not able to weight these in any particular order. The following lists industries supplied with Australian castings–

Aerospace	Food	Power Generation
Agriculture	General Industry	Pumps and Valves
Architecture	Heavy Transport	Quarries
Automotive	Marine	Rail Infrastructure
Biomedical	Memorialisation	Sculpture
Brickmaking	Mineral Processing	Smelting
Civil Engineering	Mining	Sugar Mills
Construction	Petrochemical	Water
Defence	Plumbing	

4.8 Cost Structure

Survey participants were asked to provide business metrics in % terms for the categories of Profit, Rent, Utilities, Depreciation, Waste Disposal, Wages, Purchases and Other.

This was the most commercially sensitive information requested, so not surprisingly fewer businesses were willing to share this data. The charts below show the aggregated data for those 14 businesses that were able to share their data with me.



4.9 Industry Trends

As we build data year over year, it becomes possible to monitor trends in our industry.

The following table represents comparable data for 2019, 2020 and 2021.

	Total Tonnage Cast		Number of Employee's	Number of Trainee's / Apprentices	Electricity Cost (cents / Kwh)		Annual Sales (million)
	Ferrous	Non-ferrous			Min	Max	
2019	102,883	8,113	1691	33	10.5	54.5	\$490.2
2020	100,484	12,518	1792	44	13.0	42.5	\$591.4
2021	97,221	12,796	1483	36	11.2	32.5	\$487.4

4.10 Major Issues

Survey participants were asked to identify the single biggest issue impacting on their business. Unsurprisingly, there were common themes in the 23 responses. The following gives a largely verbatim summary of these responses.

Costs

Raw material costs, Govt costs, Energy costs

Rising costs

Rising material costs

Pending electricity cost increase

Energy costs

US-China trade war impacting exports

Projects

The size, volume and timing of large projects

Variable workload impacts on training and capital investment

Covid

Covid uncertainty to market

Labour

Skilled labour shortage

Recruitment

Ability to attract and retain people in the industry

Availability of suitable labour

Lack of skilled labour

Shortage of labour

Shortage of labour

Recruitment

Shortage of labour and lack of apprentice training

Lack of apprentice training in WA

Slow payment by customer

Miscellaneous

Cheap imports

Lack of will to source locally (low cost castings from China / India)

5 Discussion

I consider a conservative estimate of metal cast in Australia is 110,000 T of Ferrous (Iron and Steel) and 27,000 T of Non-Ferrous (Al alloys, Cu base alloys, Pb).

Two of our larger ferrous metal castings businesses have downsized, which is represented in a decline in the tonnage of ferrous metal cast reported compared to the 2020 Industry Report figure. I consider that the 2021 figure is quite a strong result given these circumstances. Anecdotal information indicates that many of our metal casting businesses have strong order books.

As mentioned in 4.1, the total tonnage reported for Non-Ferrous metal in 2021 is well down from 2020. This is largely attributable to 45% decline in the global automotive industry impacting significantly on the output of 2 large Al alloy diecasting operations that export automotive components. It is expected that these numbers will bounce back as automotive supply chain issues are resolved. Partially offsetting the decline in Al alloy cast, is the strong growth in Cu based alloy cast.

The total number of employees in the industry has reduced by 20% over the 2020 reported figures. This result does not correlate with the tonnages cast. I'd consider that though 2 large ferrous foundries have downsized and 2 large diecasting operations have been impacted by automotive industry downturn, the rest of the industry has now increased output with the existing workforce.

44 trainees and apprentices are directly employed in our metal casting industry. As in previous years, the distribution of these people is highly skewed towards Queensland and Victoria. I consider that this largely due to the availability of training opportunities within each of these States. There has been an ongoing effort to develop opportunities for foundry trade training in other States. In NSW in particular, these efforts are expected to bear fruit in the near future.

Progress on these activities is frustratingly slow. There is considerable complexity involved in the process to gain approvals and funding to deliver the courses that our industry is wanting. However with patience and persistence results are being delivered. The AFI continues to have a direct role to play in advocating for funding in each of these States.

I consider a bigger issue is the securing and retention of new apprentices, shopfloor employees, and skilled personnel. Certainly in the short term we will not be able to "import" skilled personnel. These problems exist for all manufacturing industries throughout Australia and for the global metal casting industry. I am working with representatives of other manufacturing industries to explore and determine ways that we can increase the pool of people interested in working in Australian manufacturing.

All of our businesses need to find ways to develop the people that we do have and to attract more people into the industry. Some of our metal casting businesses have formed relationships with their local schools to help develop

pathways to a career in the metal casting industry. The website update, industry video, and AFI(Vic)'s "Foundry In a Box" are all aimed at raising awareness of our industry with school leavers, university graduates and the general public. To achieve this aim, each of these tools needs to be used. Be active in looking for ways to use these tools to inform people of the opportunities within the metal casting industry.

The data for electricity cost per Kwh have changed significantly over the 3 years that I've collated this report. There is a general trend of a reduction in electricity costs. However this is by no means a uniform trend. There is less State to State variability across Australia for the lowest price paid for electricity (range of \$0.11 to \$0.20 / Kwh), together with a reduction in the State to State variability on the highest price paid (range of \$0.23 to \$0.32). WA has the least variability within State of prices paid but there Best in Class is higher than all other States. There remains an opportunity for some businesses in each of the other States to reduce electricity costs by negotiating for the low end of the range. As we've seen in Queensland this is easier said than done. I'd repeat that collaborative negotiation by groups of businesses is a proven successful means to drive a better outcome with energy suppliers. Metal casting businesses should consider this approach.

All sand (silica, chromite, synthetic) costs vary greatly within States. I'd suspect that this is largely due to freight costs as much as availability. This does cover a wide range of AFS Grain Fineness Number sands.

The total reported value of castings produced is a decrease over the 2020 report. As previously mentioned, I consider that this is due to the downsizing of 2 large ferrous foundries and the slowdown for 2 large diecasting operations.

The wide range of market segments and wide range of cost structures reported reflects the significant diversity of the metal casting industry. As diverse as we are, we still have much to gain from working together on common goals.

I summarise the common goals identified in the responses to the "single biggest issue impacting on the business" are as follows -

1. Personnel – skills, availability, training.
2. Rising costs – consumables, raw materials, energy.
3. Projects – timing, local content, volume.

With these risks to business identified, the next step is to plan actions to mitigate these risks.

6 Conclusion

This third annual survey of the Australian Metal Casting Industry has built on the base level data which was reported in 2019 with a slight expansion in 2020. Support for this survey remains stable though consideration needs to be given to how this can be improved on.

Reductions have been seen in electricity pricing but risks for some in Queensland still exist, and there are opportunities for many in all States to reduce the prices currently paid.

The following comments are a repeat from 2020 - the pool of skilled personnel remains uncomfortably small with an ageing workforce. For some businesses base level positions are difficult to fill and it's also difficult to retain new employees.

We all have a role in addressing this issue. Every individual employed in the metal casting industry needs to be active in talking up the industry, encourage family and friends to explore the opportunities that a career in the metal casting industry offers.

The data and feedback paints a picture of a resilient industry that is at the initial steps of addressing the task of training a new generation of tradespeople and leaders, are technically more advanced and global leaders for many cast products, and is poised for growth and expansion in these specialised areas.

This report is only useful if it used. Plan to meet with your local member / council. Table this report with them, but also highlight the value of the metal casting business to the local area in terms of direct and indirect employment, taxes paid, economic value and capability to expand and help other businesses grow. Be active in driving this message !!

7 Appendix 1

7.1 Blank Data Response Table

Australian Metal Casting Industry Data - AFI National		2021 Survey
Data Requested	Response	Comments
1. Annual tonnage cast by metal type - Ferrous / Non-Ferrous		
2. Total number of employees to produce these castings		
3. Number of Trainers / Apprentices (Specify apprentice type)		
4. Total Power costs (KWH) (Divide your total power bill by kWh used)		
5. Heat and cold costs / Tonne (Specify heat type)		
6. Value of annual sales		
7. Casting methods used (Green Sand, Hot Sand, Investment casting, Shell mould, Die casting)		
8. Major metal segments (Automotive and Transport, Construction, Mining, Agriculture, Other)		
9. Cost Breakers to % (Fuel, Sand, Utilities, Depreciation, Waste, Disposal, Prolong, Purchases, Other)		
10. What is the single biggest issue impacting on your business?		

7.2 Letter issued with Data Response Table requesting participation.



Australian Foundry Institute

ABN 53 830 764 159

10 October 2021

Re: AFI Industry Data

To: AFI Member Casting Operation

I am writing to you requesting your co-operation and support in providing business data to enable an update to our Metal Casting Industry Report. Can you please complete the table on the following page and return directly to me.

I understand and respect that privacy and competitive advantage concerns are a significant and legitimate concern in relation to company data. To alleviate this concern, all data will be received and collated by me only. As a foundryman of long standing, now retired, with no vested interest in data from individual companies, I give my personal commitment to confidentiality. Should you require it, I am prepared to sign a legally binding Non-Disclosure Agreement.

The survey questions remain as they were for 2020. Our aim is to give directly comparable data to that which is reported in the IBIS C2121 Iron and Steel Casting in Australia report, which many of you have expressed does not accurately represent our industry.

The data received will be collated by me to produce an update to our Industry Report, which will be tabled at the 2021 Conference then distributed to all AFI members. AFI State and National bodies, along with individual members, will use this report to advance AFI causes with political decision makers.

Thank you in advance for your support. If you do have any concerns or suggestions relating to this process, can you please contact me directly. In particular, please communicate any blockers that you may have to providing this data.

Yours Sincerely,
 Alan Cooke
 AFI National President
 0427 777 081
 Email: agcooke52@gmail.com

7.3 Document supporting Survey issued with Data Response Table



Australian Foundry Industry Data 08/2020

AIM:

To produce an update of the 2021 Australian Foundry Industry Report that can be used to advance metal casting industry causes.

Data to be Requested:

1. Annual Tonnage cast by metal type.
2. Total employee's to produce these castings.
3. Number of trainee's / apprentices
4. \$ value of annual sales
5. Power costs / kWh
6. New sold cost / Tonne
7. Casting Methods Used
8. Major Market Segments
9. Cost Structure by %
10. What is the single biggest issue impacting on your business

Why Do We Need Data ??

Traditionally the AFI has been a technical body. In recent years with high power costs, training and training personnel issues, there an increasing need for the AFI to lobby political decision makers. A regular blocker to progressing AFI causes with politicians has been the lack of industry wide data.

What Are the Blockers to Getting Data ??

A major blocker for individual companies to provide data has been around privacy and competitive advantage concerns. Clearly legitimate concerns that must be protected. I stand by my credibility as a foundryman of long standing, now retired, with no vested interest in data from individual companies. A Non-Disclosure Agreement will be signed if required.

How Will Data Be Requested ??

The data will be requested by a letter from me to all AFI members companies active in metal casting, delivered through the State AFI Secretaries. It is very important that this letter is delivered to the appropriate decision maker of each of our member companies.

The request will be for the data to be returned directly to me.

It is envisaged that some members will readily provide the requested data, others will require follow up phone calls, and a few will require a face to face visit.

This stage of the data gathering process is critical to achieving a successful outcome. Identifying what actions are appropriate for each member company will be dependent on the strength of personal relationships in some cases. Could each State please give this aspect of the process significant consideration.

Collection of Data

I will be the only person to receive and collate data.

How Will the Data Be Used ??

The fully collated data will form the basis for the Industry Report. Data within the report will be provided down to State level. Regional data and individual company data will not be included in the Industry Report.

The industry report will be made available to all members by the 2021 Conference.

AFI National and each State branch, along with all members are encouraged to use the industry report to progress relevant causes of benefit to the industry.

How Frequently Will Data Be Updated ??

The intention is to continue an annual update to requested data so that it maintains it's relevance, enables trends to be identified and maintains a mindset amongst the decision makers of our member companies that an up to date Industry Report adds value to their business.

I envisage a need to develop a sustainable process of data collection and collation. As yet I haven't not been able to find a suitable 3rd party to discuss and cost this ongoing role. Any suggestions that you have would be welcome and will be followed up.

The role would be to develop the tools needed to manage the data, review Industry Reports from other countries (eg. UK, USA, China, Turkey), research what data is needed, and put forward recommendations to enhance the value of the AFI Industry Report.

Regards,

Alan Cooke | Retired President

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