



South African Foundry Industry

PRESENT STATUS AND FUTURE TRENDS
Presented to the V BRICS Foundry Forum

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INTRODUCTION

SOUTH AFRICAN INSTITUTE OF FOUNDRYMEN

- Constituted in 1939 as a branch of the Institute of British Foundrymen (IBF) now (ICME)
- Established as the SAIF in 1964
- Is a non – profit company
- Focus on skills development, training and education
- Presently receives financial support from The National Foundry Technology Network (NFTN), an agency of the South African government.
- Membership – 174 of which 72 are companies

Presentation Outline

1. Foundries: Geographic Distribution
2. Foundry Industry in South Africa
3. Challenges and Opportunities
4. Conclusion

South Africa



Province	Population (2014 est.)	%
Gauteng	12,914,800	24%
Kwa-Zulu Natal	10,694,400	20%
Eastern Cape	6,786,900	13%
Limpopo	5,630,600	10%
Western Cape	6,116,300	11%
Mpumalanga	4,229,300	8%
North West	3,676,300	7%
Free State	2,786,800	5%
Northern Cape	1,166,700	2%
Total	54,002,000	100%

Contribution to the GDP in South Africa

Province	Contribution to GDP '2015
<u>Gauteng</u>	34,7%
<u>Kwa-Zulu Natal</u>	15,8%
<u>Western Cape</u>	14,0%

Geographical location of foundries in South Africa

Province	No. of foundries '2015	% of total foundries '2015
Gauteng	114	66%
Kwa-Zulu Natal	20	12%
Western Cape	14	8%
Eastern Cape	8	5%
Free-State	5	3%
North-West	4	3%
Northern Cape	3	2%
Mpumalanga	2	1%
	170	100

Industry Structure By Foundry Type

Foundry Type	No. of foundries in '11	No. of foundries in '15	2014 v/s 2011 change in %
Ferrous (Iron and Steel)	74	88	+ 19%
Non-Ferrous (Aluminum, Brass & Zinc) Sand, Gravity, Low Pressure	70	54	- 22%
High Pressure Die-casters	31	23	- 26%
Investment Casting	5	5	0%
Total number of Foundries	180	170	- 6%

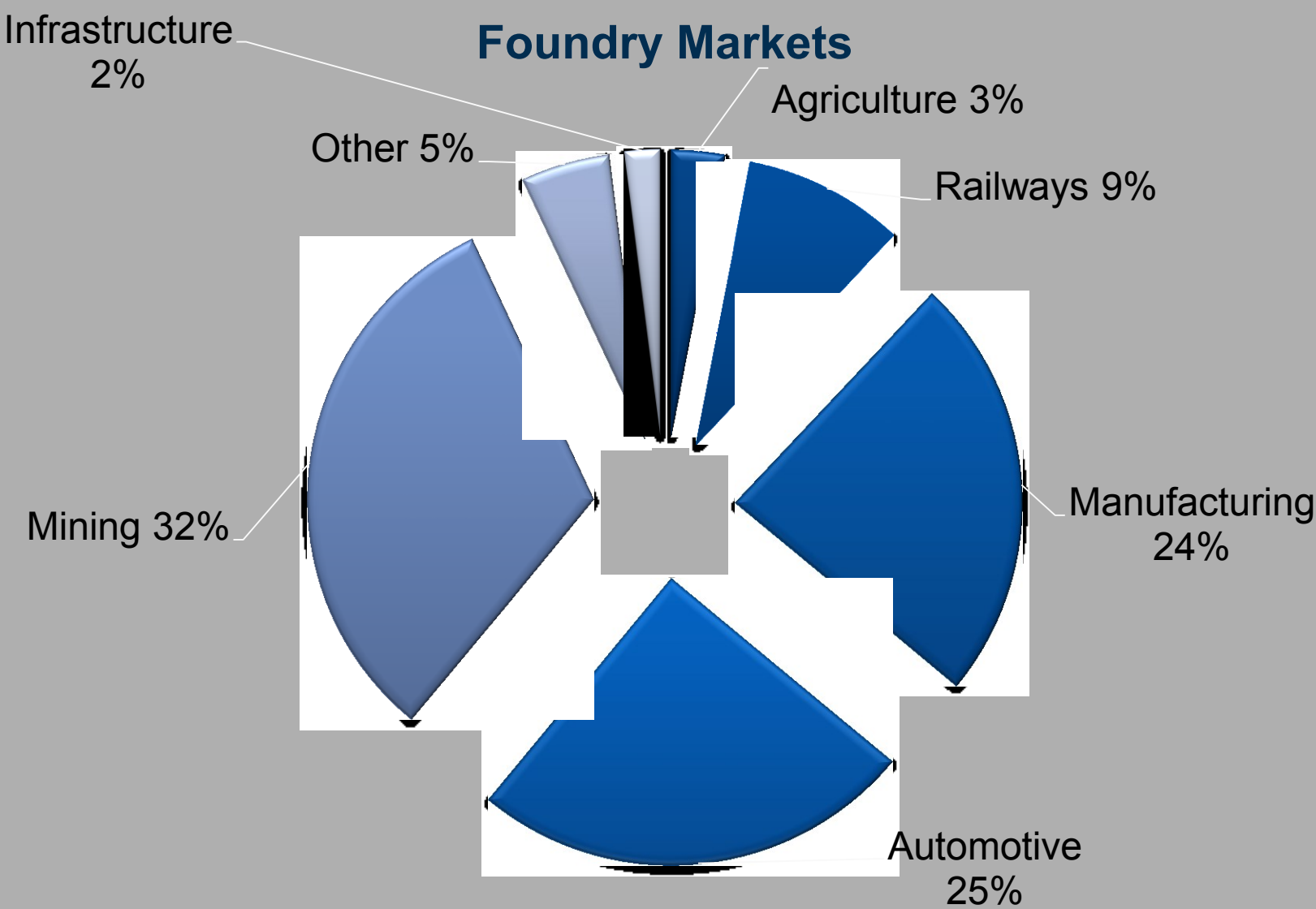
- ❖ **There are 44 foundries making castings in steel and / or stainless steel, of which 3 are investment casting foundries**
- ❖ **There are an additional 13 art casting foundries and 11 spin casting operations**

Estimated Annual Production by Metal Type

Metal Type	Est. annual production '03 (tons)	Est. annual production '07 (tons)	Est. annual production '12 (tons)	Est. annual production '13 (tons)	Est. annual production '14 (tons)
Aluminum	66,000	77,800	21,000	22,000	22,000
Brass	9,000	8,200	Copper Based 14,300	9,100	8,500
Bronze	6,000	7,600			
Zinc	3,000	4,200	1,400	900	800
Grey Iron	110,000	147,000	161,000	155,000	138,000
Ductile Iron	100,000	86,000	59,000	47,000	61,500
Other cast iron (White Iron)	85,000	145,600	54,000	28,500	40,500
Steel	123,000	179,100	118,000	106,000	103,000
Stainless steel	4,000	4,900	5,800	6,500	6,000
Total annual production	506,000	660,400	416,500	375,240	380,300

❖ Note: All the above exclude grinding media produced by SCAW Metals Goup

Markets served by the SA foundry industry



Main Casting Processes used in Foundries

Process Type	No. of foundries using the process (%)
Sand	100%
Bonded sand	70%
Green sand	28%
Shell	2%
Permanent Mould	100%
Gravity	61%
Low Pressure	4%
High Pressure Die-casting	32%
Other	3%

Gauteng

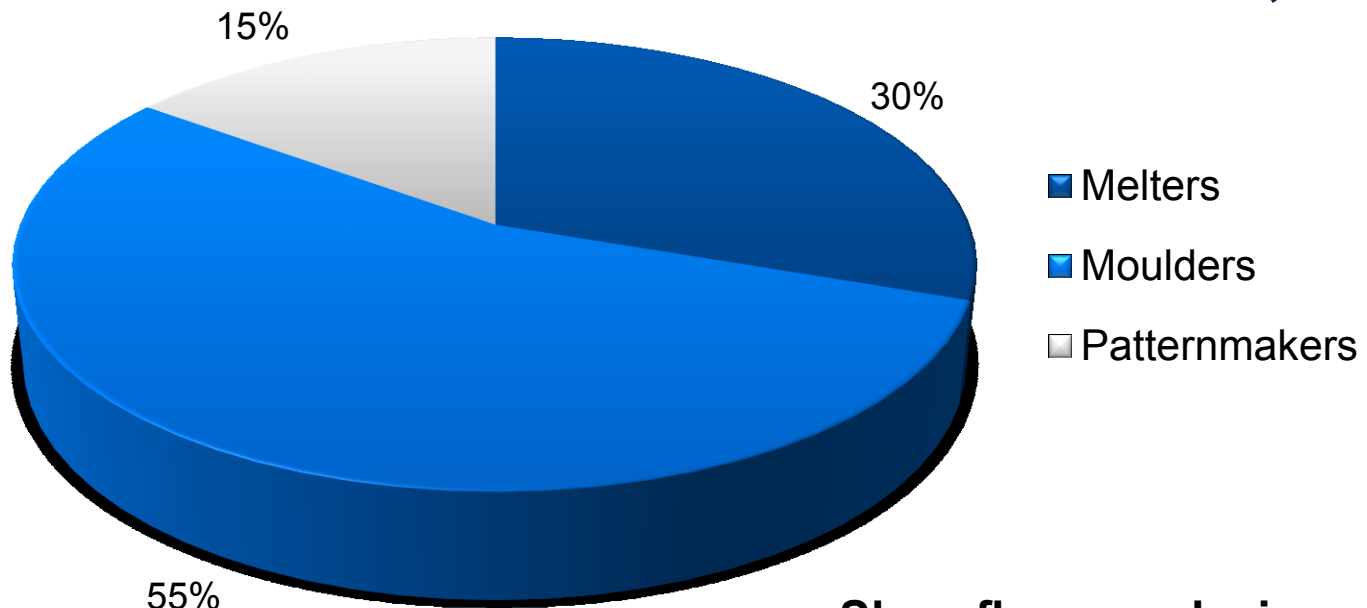
Foundry Type	No. of foundries	No. of foundries (%)
Production	26	24%
Jobbing	64	55%
Prod. & Jobbing	24	21%

Employment in the Foundry Sector

- Estimated no. of direct employees in 2015 – **10,250**
 - 80% of employees are previously disadvantaged individuals
- Estimated number of indirect employees **4,000** (Adding Value to Products in machining, sub-assembly and final assembly)

Skill Base

Total of 14,250



Challenges facing the SA Foundry Industry

- **Import Leakages and Reduction of Orders due to Slow Economic Growth**
- **Rapidly Rising Energy Costs**
- **Low Labour Productivity**
- **Lack of Skills Development and Training**
- **Compliance with Environmental Regulations**
- **High Transport and Logistics Costs**
- **Limited Access to Capital**
- **Recent Technological Developments Require Special Skills**
- **Foundry Environment is not Attractive**

Opportunities for the SA foundry industry

- **Availability of raw materials** - scrap metals and ferro-alloys
- **Pockets of excellence** in terms of manufacturing quality;
- **A high level of flexibility and engineering versatility**, i.e. small production runs, mixed process and mixed metal production;
- **Spare production capacity** – the foundry industry on average operates at utilization rates of 70% or less, based on a single shift scenario.
- **Localization and designation** – The industry is well positioned to grow as a result of these programs .
- **Capital Investment assistance from government**
- **The National Foundry Technology Network (NFTN)** – assists foundries and supports skills development, training and education for the industry

TRAINING AND EDUCATION

Apprentice Training

- **Gauteng Foundry Training Centre (GFTC)**
Opened in 2014 near Johannesburg
Patternmakers, Melters and Moulders are trained for 3 years
Industry support for specialised subjects and on – the – job work experience



4.3 NEW FOUNDRY GENERATION FORUM (NFGF)

- The first group of young foundrymen and women completed their initial programme in 2014, with a presentation of their project work. Industry members were fully supportive. (An immediate permanent position was offered by one the major foundries to a young female engineer in training)
- The positive feedback from the “new generation” about the interaction, teamwork and collaboration was a significant benefit
- The first feedback from the 2015 group to industry members was inspirational by demonstrating the positive impact already made at their respective companies
- The continued support of the industry is guaranteed and advance management skills development would be welcomed.



SHORT TECHNICAL COURSES

- The SAIF has developed technical training material in all field of the foundry technology including;

Melting & Metallurgy	Practical Sand Testing
Sand & Moulding Sands	Heat Treatment
Die Casting	Stainless Steel Casting
Cores & Core making	Non Destructive Testing
Fettling	Casting Design & Methods
Quality Control	Productivity & Production Planning
Supervisory Management	

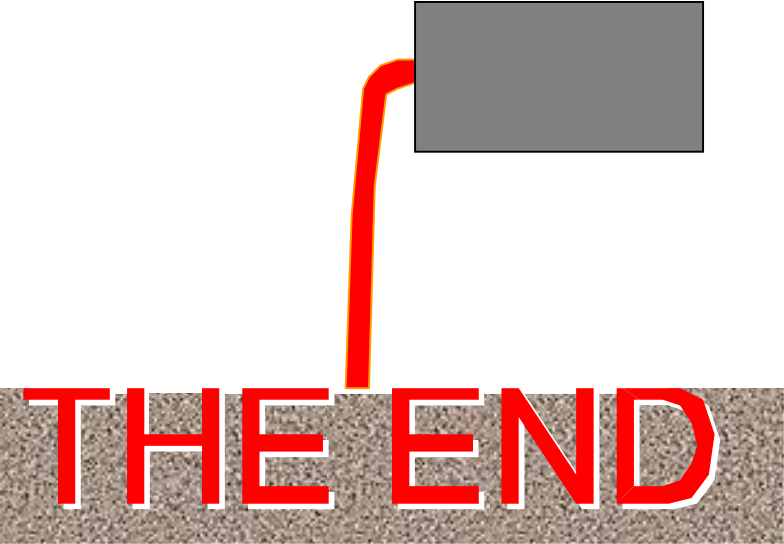
- Customized training is also offered for on –site presentation
- Courses are for foundry workers and held outside working hours
- These courses are partially subsidized by the NFTN

Future Trends.....

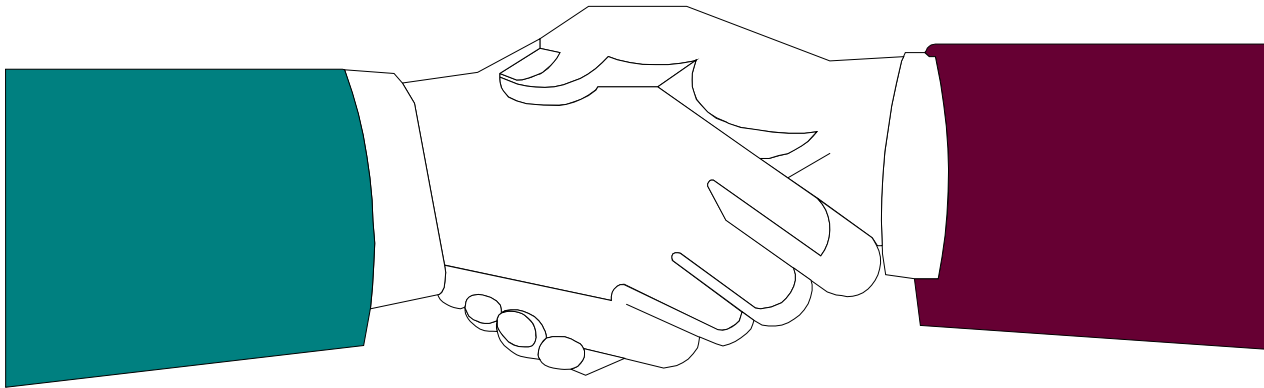
- **Consolidation and Possible Closures**
- **Energy Efficiency and Alternative Sources (CPV)**
- **Environmentally more Friendly Technologies**
- **Improved Mechanization in Jobbing Foundries**
- **Reduced Waste Sand due to Improved Reclamation Systems**
- **Improved Process Controls**
- **Increased use of Design Simulation and 3 D Printing**
- **Increased use of Robotics in Fettleing Operations**
- **Improved Skills for Increased Productivity**

Conclusion

- The goal of the SAIF is to leverage both increased demand and new technology to grow the industry, improve competitiveness and build human capacity.
- Thanks to NFTN, which assisted in compiling the statistics.



Thank you





In diversity we unite

Thank you