

*PIG IRON PRODUCTION IN
MINAS GERAIS*

STATISTICAL **YEARBOOK**

REFERENCE: 2022

"PIG IRON IS AT THE BASE OF EVERYTHING"



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YEARBOOK**

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SINDIFER

Union of the Iron Industry in the State of Minas Gerais

STATISTICAL YEARBOOK

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SINDIFER and the Pig Iron Industry in Minas Gerais

The Union of the Iron Industry in the State of Minas Gerais - SINDIFER, was formed on the 30th of April 1933; in 2023 it turns 90.

Since its foundation it has had 14 Presidents, being Dr. Euvaldo Lodi the first of them.

Its main objective is to bring together and institutionally represent the Pig Iron producers in Minas Gerais, mainly in the labor, legal, environmental and tax areas with the public entities and bodies.

Another activity performed by SINDIFER is to seek ways to create a favorable business environment for member companies to operate and have logistical means for supplying and distributing products.

SINDIFER is part of the Industry National System and affiliated to Federation of Industries of (Federação das Indústrias de) Minas Gerais - FIEMG.

Pig Iron is a product of iron ore reduction and raw material for steel mills and foundry industries. The product of the Mills in Minas Gerais is considered sustainable because it utilizes charcoal obtained from planted forests; this is the great differential from the one produced in other countries where coal (coke) is utilized.

Associated Companies

ArcelorMittal Brasil S/A.
AVG Siderurgia Ltda.
CBF Indústria de Gusa S/A.
Cia. Siderúrgica Santa Bárbara.
Citygusa Siderurgia Ltda.
Cosimat - Siderúrgica de
Matozinhos Ltda.
CSS - Siderúrgica Setelagoana
Ltda.
Fergubel - Ferro Gusa Bela Vista
Ltda.
Ferguminas Siderurgia Ltda.
Gelf Siderurgia S/A.
Gerdau Aços Longos S/A.
Metalfer Siderurgia Ltda.
Metalsete Siderurgia S/A.
Metalsider Ltda.
Minasfer Siderurgia Ltda.
Minas Gusa Siderurgia Eireli.
Modulax Siderurgia S/A.
Multifer Siderurgia Eireli.

SAMA - Santa Marta Siderurgia
Ltda.
São Jorge Siderurgia Ltda. -
Matriz / Parent Plant.
São Jorge Siderurgia Ltda. - Filial /
Branch Plant.
SDS Siderúrgica Ltda.
Siderbras Siderúrgica Brasileira
Ltda.
Sidercam Siderúrgica Ltda.
Sidercop Siderurgia Ltda.
Sidermin - Siderúrgica Mineira
Ltda.
Siderúrgica Alterosa S/A.
Siderúrgica Itabirito Ltda.
Siderúrgica Valinho S/A.
SIP Siderurgia Ltda.
Tecnosider Siderurgia Ltda.
Usina Siderúrgica Atlas S/A.
Vallourec Soluções Tubulares
do Brasil S/A.
Viena Siderúrgica S/A.

President's Message



Dear Sirs,

Hereby I am pleased to present the 2023 Statistical Yearbook, bringing the main numbers and indices of 2022, related to the production of the Pig Iron Industry in Brazil, with emphasis in Minas Gerais, and information related to raw materials, inputs and market.

The year of 2022 started with a high level of insecurity. Although the impact of pandemic showed signs of weakening, no one would know what the level of commitment and resilience of the economies of companies and countries would be.

Uncertainties increased with the beginning of the conflict between Russia and Ukraine, both major exporters of Pig Iron, when there were significant oscillations of demand and price, result of the insecurity generated. These oscillations were accommodated as the conflict developed.

Even in this context, I believe that 2022 was again a good year for the sector which grew up compared to 2021. As a matter of fact, in Southeastern Region (Minas Gerais and Espírito Santo), the production was of 4,447,107 tons, representing 78.9% of total production in Brazil.

For the next year, that may also begin with many uncertainties, due

mainly to the economic reflections generated by pandemic that only now are appearing and the lack of clarity about the new economic policy to be adopted by the new federal government. However, expectation of the sector is that it will continue to grow.

As it has been said, the sector has a strategic factor for sustainability which is the use of charcoal from planted forests as thermo-reducer. This charcoal makes the Pig Iron produced in Minas Gerais DECARBONIZED, what makes it different from the others produced in the world where coke is used as thermo-reducer.

Therefore, we can state that the sector is aligned with the purposes of the new world order and makes a real contribution for achieving the decarbonization goals of the steel industry and thus consolidating itself as a competitive advantage in the domestic and international market.

I am confident this yearbook will be useful to all of you.

Greetings,
Fausto Varela Cançado

Independent producers of Pig Iron in the state of Minas Gerais

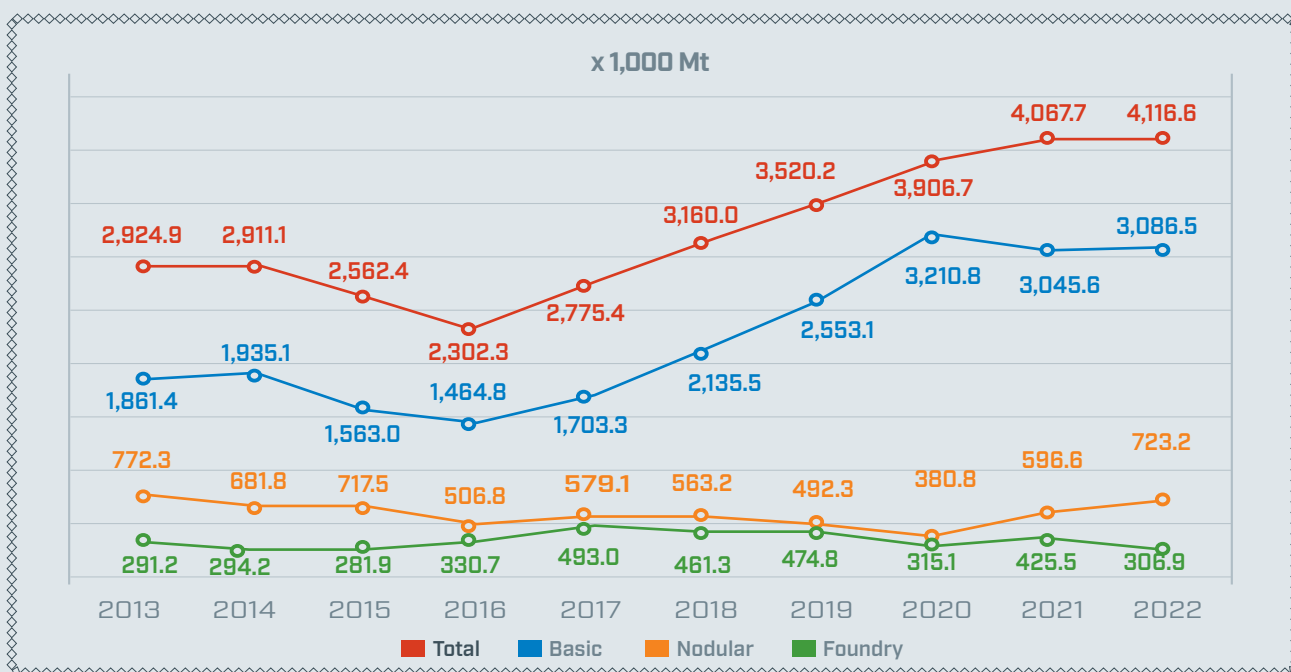
NORTHWESTERN REGION		
Municipality	Number of Plants [*]	Installed Capacity [Mt/month]
Sete Lagoas	22	241,900
Matozinhos	3	19,800
Curvelo	1	11,000
Pedro Leopoldo	1	6,000
Total Northwest	27	278,700
WESTERN REGION		
Municipality	Number of Plants [*]	Installed Capacity [Mt/month]
Divinópolis	7	46,000
Itaúna	2	36,000
Pará de Minas	2	21,700
São Gonçalo do Pará	2	8,000
Conceição do Pará	1	6,000
Nova Serrana	1	7,000
Pitangui	1	20,000
Maravilhas	1	4,000
Itaguara	1	4,000
Itatiaiuçu	1	6,000
Bom Despacho	1	4,500
Lagoa da Prata	1	5,000
Total West	21	168,200
OTHERS		
Municipality	Number of Plants [*]	Installed Capacity [Mt/month]
Betim	1	28,000
Itabirito	1	6,000
Itabira	1	10,000
Total Other Townships	3	44,000
TOTAL MINAS GERAIS	51	490,900 Mt/month

Source: Companies. [*] Plants that were totally or partially in operation throughout 2022.

Categories of pig iron produced in Minas Gerias [independent producers]

Year	Metric tons			
	Basic	Nodular	Foundry	TOTAL
2013	1,861,417	772,304	291,236	2,924,957
2014	1,935,107	681,778	294,247	2,911,132
2015	1,563,020	717,451	281,856	2,562,327
2016	1,464,818	506,809	330,741	2,302,368
2017	1,703,332	579,067	492,994	2,775,393
2018	2,135,461	563,230	461,319	3,160,010
2019	2,553,120	492,254	474,767	3,520,142
2020	3,210,750	380,791	315,114	3,906,655
2021	3,045,644	596,600	425,523	4,067,767
2022	3,086,460	723,176	306,923	4,116,559

Sources: Companies/SINDIFER



Pig Iron in Minas Gerais:

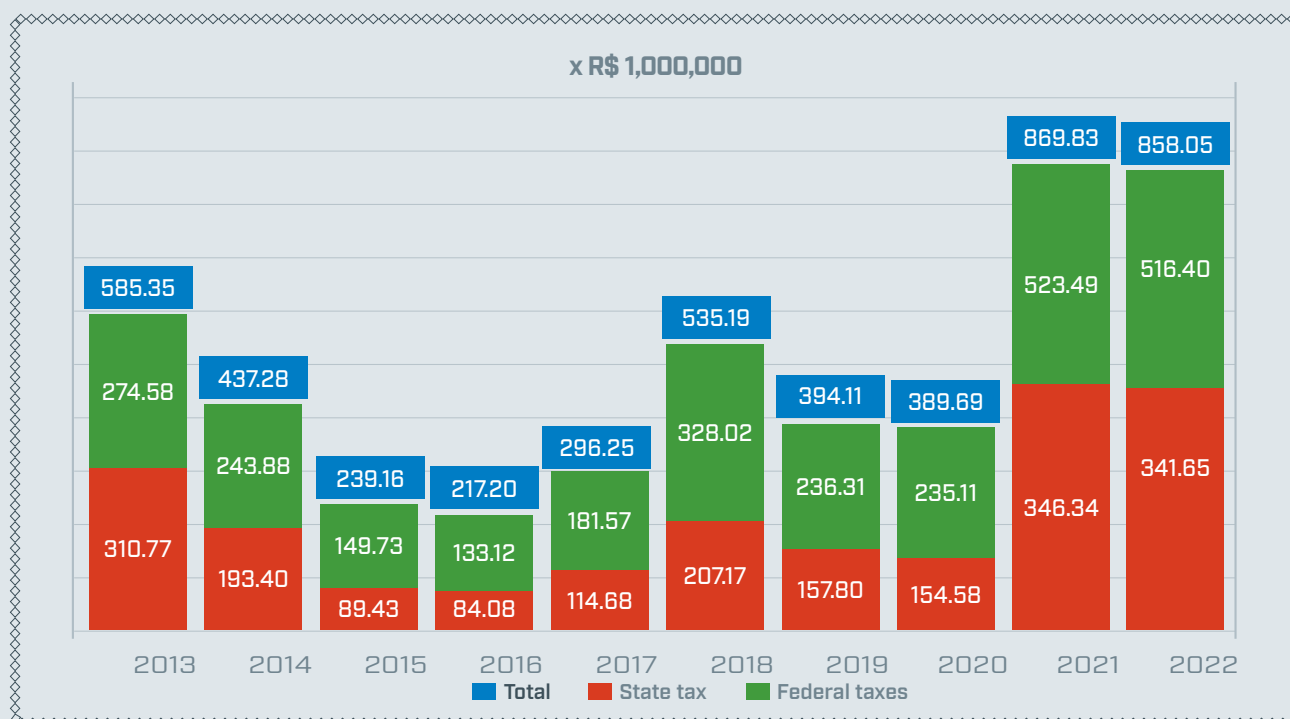
This state is a reference in Pig Iron production, not only for its pioneering spirit, but also for the quality of its product. Indeed, the industrial park in Minas Gerais is formed by 51 plants (Dec./2022), spread across in 19 municipalities, having Sete Lagoas and region as the main industrial pole. All the plants together add up to an installed production capacity of 490,900 tons/month. Of the total Pig Iron produced in Brazil, 78.9% are produced in Minas Gerais.

All the sorts of Pig Iron – basic, nodular and foundry - are produced here and specifications depend on the end-use.

Tax collection by the Pig Iron industry in Minas Gerais | x R\$1,000.00

Year	State Tax	Federal Taxes			TOTAL
	ICMS	PIS	COFINS	IPI	
2013	310,767.70	35,160.80	156,489.70	82,634.00	585,352.20
2014	193,405.00	31,069.00	132,207.70	80,585.40	437,267.10
2015	89,428.20	18,196.40	78,249.60	53,285.60	239,159.80
2016	84,076.60	15,414.00	70,998.00	46,709.20	217,197.80
2017	114,678.12	21,018.62	96,836.26	63,713.11	296,246.11
2018	207,169.37	37,981.05	174,943.03	115,094.10	535,187.55
2019	157,805.00	27,052.00	126,214.00	83,035.00	394,106.00
2020	154,582.68	25,443.89	117,483.24	92,181.96	389,691.77
2021	351,940.46	66,999.02	308,578.36	158,334.09	885,851.93
2022	341,649.93	64,795.68	298,452.81	153,153.42	858,051.84

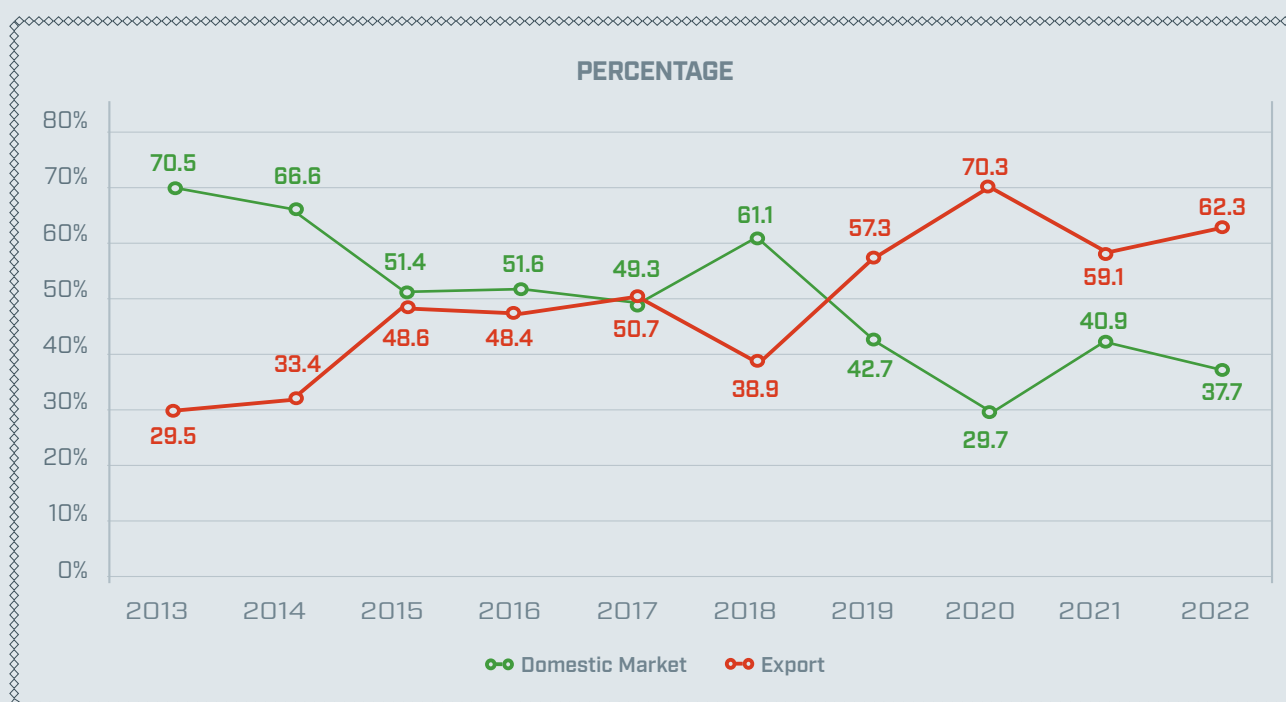
Sources: SEFAZ/MG and Companies



Sales of the independent Pig Iron produced in Minas Gerais

Year	Domestic Market		Exports	
	Metric tons	%	Metric tons	%
2013	2,065,852	70.5	859,106	29.5
2014	1,941,816	66.6	972,316	33.4
2015	1,316,669	51.4	1,245,658	48.6
2016	1,187,019	51.6	1,115,349	48.4
2017	1,369,291	49.3	1,406,102	50.7
2018	1,931,109	61.1	1,228,901	38.9
2019	1,502,901	42.7	2,017,241	57.3
2020	1,158,647	29.7	2,748,008	70.3
2021	1,664,572	40.9	2,403,195	59.1
2022	1,551,093	37.7	2,565,466	62.3

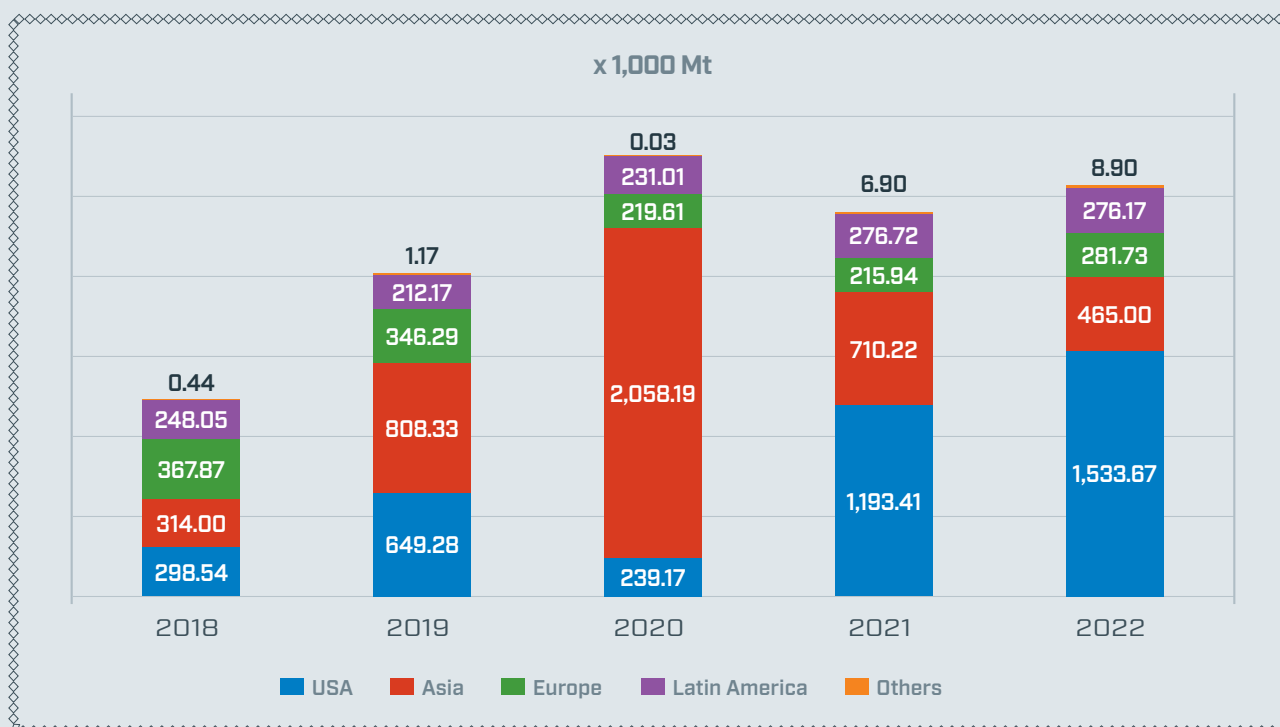
Sources: Companies/ME Comex stat



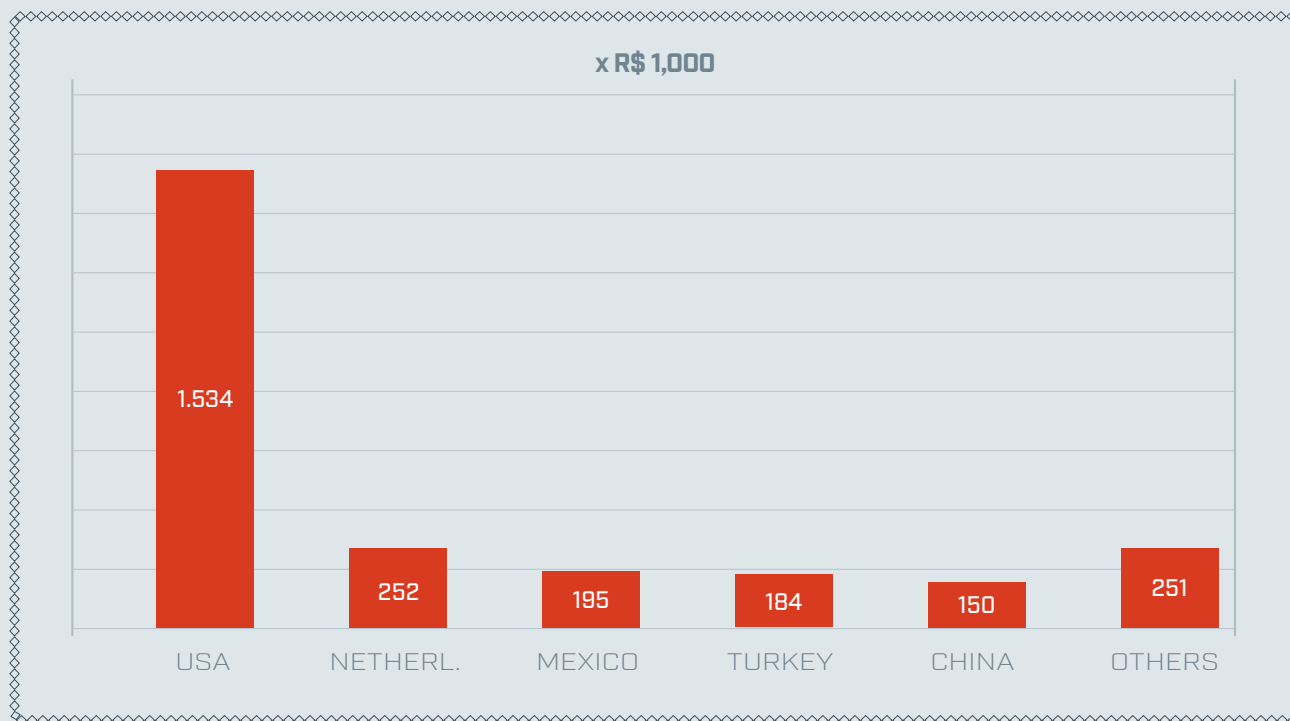
Destinations of the Pig Iron exported Origin: Minas Gerais

Importers	Unit: 1,000 Mt				
	2018	2019	2020	2021	2022
U S A	298.54	649.28	239.17	1,193.41	1,533.67
Asia	314.00	808.33	2,058.19	710.22	465.00
Europe	367.87	346.29	219.61	215.94	281.73
Latin America	248.05	212.17	231.01	276.72	276.17
Others	0.44	1.17	0.03	6.90	8.90
TOTAL	1,228.90	2,017.24	2,748.01	2,403.19	2,565.46

Sources: Comex stat/SINDIFER



Main Importers of pig iron from Minas Geras

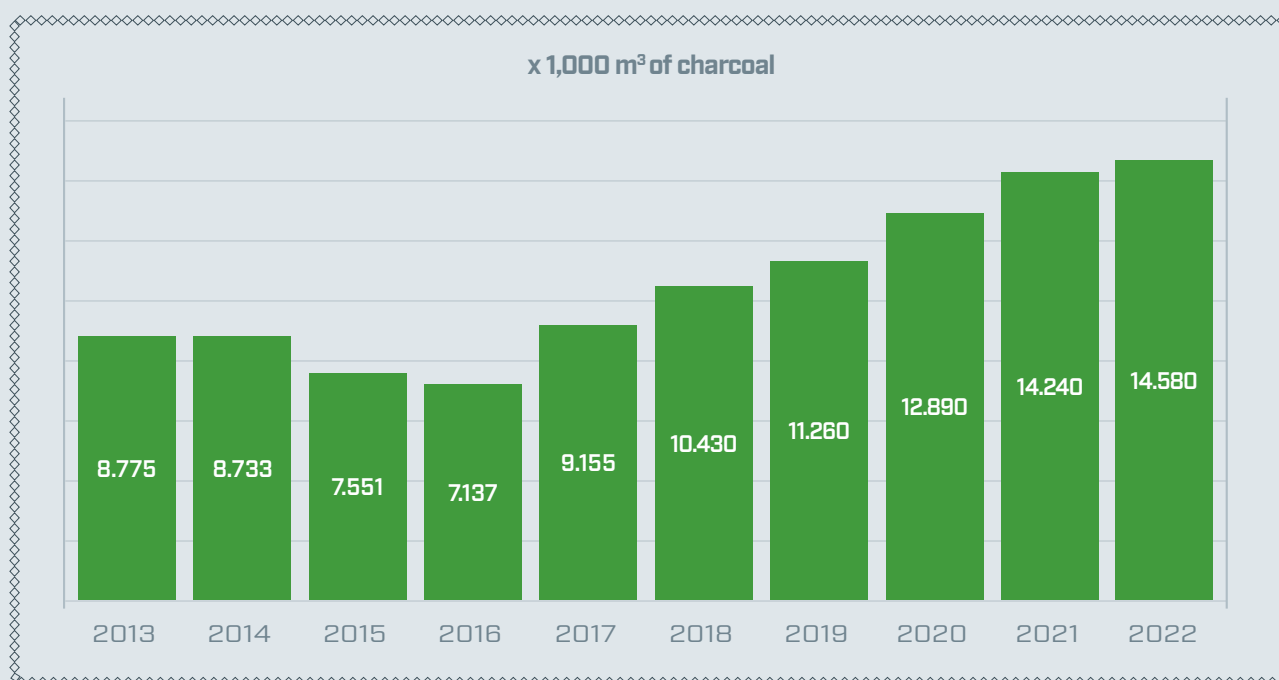


Charcoal consumption by the independent Pig Iron industry in Minas Gerais

Year	2013	2014	2015	2016	2017
Consumption (x 1,000 m ³)	8,775	8,733	7,551	7,137	9,155

Year (Cont.)	2018	2019	2020	2021	2022
Consumption (x 1,000 m ³)	10,430	11,260	12,890	14,240	14,580

Sources: IEF/Companies/SINDIFER



Sustainability and alignment with COP 26 (Decarbonization)

In the search for a sustainable production, the companies in Minas Gerais and Espírito Santo maintain a strict and permanent follow-up of all their processes, with emphasis on operation of their equipment and acquisition of raw material in perfect compliance with the environmental legislation.

However, the great differential in favor of pig iron produced in

Minas Gerais and Espírito Santo is in the exclusive utilization of charcoal, which, by its turn, must come exclusively from planted forests. This source of thermo-reducer makes a significant difference from the pig iron produced in other countries where fossil coal (coke) is utilized. An inventory carried out, as a real case-study, using the GHG Protocol applying "Scopes 1, 2 and 3" along the production chain

showed that: for each ton of pig iron produced with charcoal, between removal and emission, there is a balance of removal of 1.8 ton of CO₂ e.

"The purposes of sustainability and decarbonization are already realities in the pig iron industry in Minas Gerais and Espírito Santo."

Coppicing regeneration and plantings of eucalypts in Minas Gerais



A commercial plantation of eucalypts

Photo by AMIF



Job opportunities

Employments generated by the production of Pig Iron with charcoal in the independent plants in Minas Gerais and by the respective forest sector

2021			
AT THE MILLS	Number of Jobs		
	Direct ⁽¹⁾	Indirect ⁽²⁾	TOTAL
Production of Pig Iron	9,940	23,856	33,796
IN THE FOREST SECTOR	Number of Jobs		
	Direct ⁽¹⁾	Indirect ⁽²⁾	TOTAL
Establishment and maintenance of forests	2,056	6,168	8,224
Production and transport of charcoal	19,150	57,450	76,600
Total Forest Sector	21,206	63,618	84,824
TOTAL (2018) [Mills + Forest Sector]	31,146	87,474	118,620

2022			
AT THE MILLS	Number of Jobs		
	Direct ⁽¹⁾	Indirect ⁽²⁾	TOTAL
Production of Pig Iron	10,065	24,156	34,221
IN THE FOREST SECTOR	Number of Jobs		
	Direct ⁽¹⁾	Indirect ⁽²⁾	TOTAL
Establishment and maintenance of forests	1,623	4,869	6,492
Production and transport of charcoal	20,940	62,820	83,760
Total Forest Sector	22,563	67,689	90,252
TOTAL (Mills + Forest Sector)	32,628	91,845	124,473

Sources: SINDIFER and companies.

The Companies and Social Welfare - jobs and actions

Other relevant characteristic of the Pig Iron industries is the generation of both direct and indirect jobs. These jobs are mainly in forestry area (forest plantation and charcoal production); these sectors open opportunities for economic activities in rendering services, commerce, industry and agricultural. In addition, in social area, the Pig Iron industries have a harmonious coexistence in the communities where they are, including the promotion of actions.

General data of the steel industry

WORLD PRODUCTION OF CRUDE STEEL				
X 10 ³ Mt				
Year	World	China	Latin America	Brazil
2015	1,620,186	803,800	63,678	33,258
2016	1,627,521	807,600	60,090	31,646
2017	1,730,110	870,900	64,642	34,778
2018	1,809,087	928,300	65,775	35,407
2019	1,848,869	996,342	60,072	32,236
2020	1,826,626	1,054,429	55,555	30,971
2021	1,910,928	1,031,049	64,648	36,038
2022	1,829,286	1,010,820	62,033	33,977

Source: IABr

BRAZILIAN EXPORTS OF STEEL PRODUCTS - 10 ³ Mt					
SPECIFICATIONS	2018[*]	2019	2020	2021	2021
1- Semi-finished	8,830.00	8,668.00	7,792.00	8,003.70	8,003.70
2- Flat products	2,648.00	2,160.00	1,501.30	1,586.40	1,586.40
3- Long products	1,871.00	1,742.00	1,242.00	1,170.20	1,170.20
4- Other products	468.00	245.00	206.80	193.60	193.60
TOTAL	13,817.00	12,815.00	10,742.10	10,953.90	10,953.90

[*] Estimates

BRAZILIAN IMPORTS OF STEEL PRODUCTS - 10 ³ Mt					
SPECIFICATIONS	2018	2019	2020	2021	2022
1- Semi-finished	173.00	211.00	79.60	949.10	208.3
2- Flat products	1,433.00	1,292.00	1,189.80	2,324.70	1,943.7
3- Long products	455.00	505.00	435.90	1,165.40	730.7
4- Other products	346.00	353.00	321.00	533.40	457.1
TOTAL	2,407.00	2,361.00	2,026.30	4,973.60	3,339.8

Source: IABr

PRODUCTION OF THE FOUNDRY INDUSTRY - 10 ³ Mt					
SPECIFICATIONS	2018	2019	2020	2021	2022
Iron	1,840.20	1,837.80	1,622.20	2,036.50	2,263.58
Steel	244.00	259.20	256.90	267.10	289.59
TOTAL	2,084.20	2,097.00	1,879.10	2,303.60	2,553.17

Source: ABIFA

FIEMG



Union of the Iron Industry in the State of Minas Gerais

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