

LATEST DEVELOPMENTS IN STEELMAKING CAPACITY

2020



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Latest developments in steelmaking capacity

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ABSTRACT

The Secretariat of the OECD Steel Committee provides monitoring reports on crude steelmaking capacity developments on a regular basis, using a wide range of publicly available and commercial data sources. This paper presents an updated overview of regional capacity trends, including an assessment of gross capacity additions in the period until 2022, as well as information on cross-border capacity investments. The latest available data suggest that global steelmaking capacity (in nominal crude terms) increased in 2019 by 1.5% from the levels of 2018. Moreover, many investment projects continue to take place around the world and others are in the planning stages. Should these projects be realized, global steelmaking capacity could increase by approximately 2-3% between 2020 and 2022 in the absence of closures. In the context of global excess capacity, it will be important for policymakers to continue closely monitoring investments and closures that take place in the steel industry.

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1. Summary of the latest steelmaking capacity developments

The Secretariat of the OECD Steel Committee provides monitoring reports on crude steelmaking capacity developments to members of the Committee on a regular basis. The Secretariat monitors capacity developments on an ongoing basis and updates its capacity figures to reflect incoming publicly available information on capacity closures and new information on the status of investment projects.

This paper presents an overview of steelmaking capacity developments taking place around the world and provides an assessment of gross capacity additions that could come on stream during the three-year period 2020-22, based on information available until December 2019¹. The document also includes a brief summary by region, identifying closures of capacity and new investment projects, as well as information on cross-border capacity investments. The latest available data suggest that global steelmaking capacity (in nominal crude terms) increased in 2019 by 1.5% from the levels of 2018. Moreover, many investment projects continue to take place around the world and others are in the planning stages. Should these projects be realized, global steelmaking capacity could increase by approximately 2-3% between 2020 and 2022 in the absence of closures. In the context of global excess capacity, it will be important for policymakers to continue closely monitoring investments and closures that take place in the steel industry.

The Secretariat has been working on the construction of a crude steelmaking capacity database at the plant and firm level, in the context of Output Result 1.2.5.5.1 of the Steel Committee's 2019-20 Programme of Work and Budget that is helping to improve the quality of the capacity aggregates by economy. The coverage of the database has increased significantly since the interim capacity report discussed by the Steel Committee in September 2019, particularly with the coverage now extending to include China but also major steel-producing economies elsewhere in Asia, the Middle East, and other regions. Because the plant-level data are used as the basis for the aggregate figures, this work is leading to revisions in the aggregate figures for some economies and globally (see Box 1).

This report has been revised to take into account written comments from delegations received until 10 April on the original version of the paper. As in the past, the Secretariat invited comments from Steel Committee delegates on the original version of the report, and in particular the investment, closure and existing capacity data provided in Annexes A-C. This revised report is now submitted for declassification by the Steel Committee. Following its declassification, the report will be made available on the OECD Steelmaking Capacity portal at oe.cd/steelcapacity, and the updated aggregate capacity figures will be made available on OECD.stat.

Box 1. Revisions to the capacity aggregates based on the plant-level database

The Secretariat has been working on the construction of a crude steelmaking capacity database at the plant and firm level, in the context of Output Result 1.2.5.5.1 of the Steel Committee's 2019-20 PWB that is helping to improve the quality of the capacity aggregates by economy. The database, which uses a wide range of publicly available and commercial data sources, extends back to the year 2000. The database currently includes steel-producing economies that together account for 88% of global capacity, although it is important to note that the global capacity figure can change as more countries are added to the database. While the plant-level database currently includes major steel-producing economies including China, most OECD countries, and countries with steelmaking capacity across Africa, Latin America, the Middle East and Oceania, several important economies still need to be added to the database. These include India, Indonesia, Malaysia, Thailand, Turkey, as well as several smaller countries that have crude steelmaking capacity (see document [DSTI/SC\(2020\)5](#) for further information on the current status and coverage of the database). The Secretariat plans to include the remaining major steel-producing countries into the database by September 2020, with the smaller countries to be added by the end of the year.

The in-depth plant-level analysis conducted by the Secretariat now provides a more complete picture about capacity developments for economies. As the plant-level data become available, they are used to derive the aggregate capacity figures for the relevant economy. Aggregate figures for some economies, based on plant-level data, have already been introduced in previous steelmaking capacity reports since 2018, as the information became available in plant-level database. The plant-level data are also updated on a continuous basis, and thus the aggregates for those economies can also undergo revision from time to time.

The major change in this report is the inclusion of plant-level data for China, several OECD countries in Asia and the NAFTA region, and for economies in the Middle East. As a result of the analysis, the aggregate steelmaking capacity figure for China was revised upwards by 96 mmt for 2019, compared to the September 2019 estimate, with more minor revisions being made to the aggregate figures for Japan, Korea, Mexico, the United States and some countries in the Middle East including Iran and Saudi Arabia. The global capacity figure for 2019 was revised upward by 72 mmt, with the upward revision China being partly offset by downward revisions in several other economies.

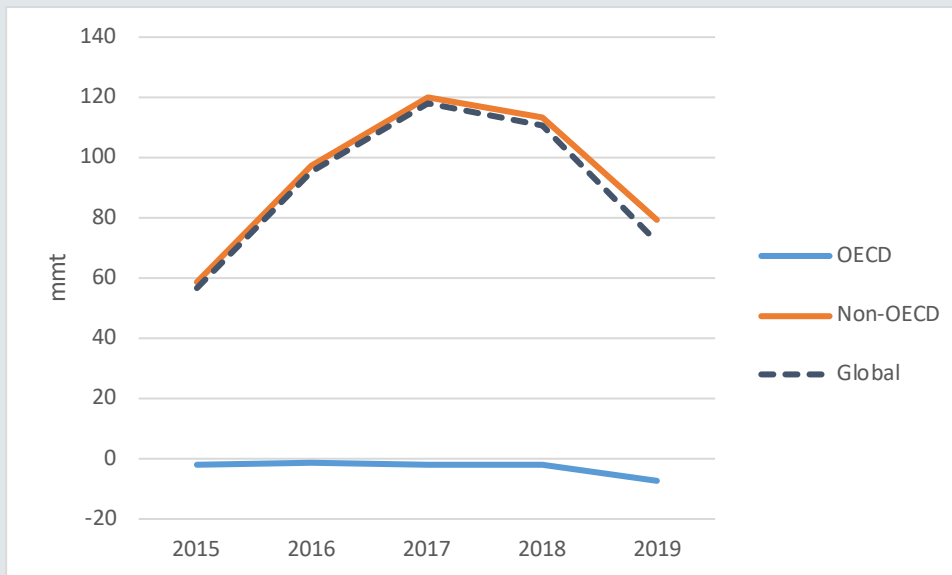
As the plant-level data extend back to 2000, revisions were made to capacity aggregates going back in time, where necessary. Figure 1 shows the revisions for the last five years, indicating the difference (in mmt) between the March 2020 estimates and the estimates presented to the Steel Committee in September 2019 for the OECD, non-OECD and world capacity aggregates.

As shown in the figure, major revisions were made to the non-OECD aggregate, reflecting the upward revision to Chinese capacity which averaged slightly more than 100 mmt per annum since 2015. This was partially offset by downward revisions mainly in non-OECD Middle East and CIS economies. The OECD aggregate was revised downwards by an average of 3 mmt per annum during the period, reflecting higher figures for some years within NAFTA and Japan that were more than offset by lower figures for Korea.

The revisions made to country aggregates after taking into account the plant-level information are due to the availability of more complete information. For China, the aggregate capacity levels were previously based on the aggregate figures published by official sources, complemented with more recent information collected by the Secretariat on closures and new capacity additions. The aggregate for China is now based solely on the sum of all the plants in existence for which information is available to the Secretariat. Similarly, for some other countries, previously available aggregate figures (provided earlier by delegations themselves or published by e.g. national steel associations) were complemented with more recent information on closures and new additions to derive aggregate figures for subsequent years. For those countries, too, the aggregate figures now reflect the population of plants in existence for which information is available to the Secretariat.

Figure 1. Revisions to steelmaking capacity

Difference between March 2020 and September 2019 estimates



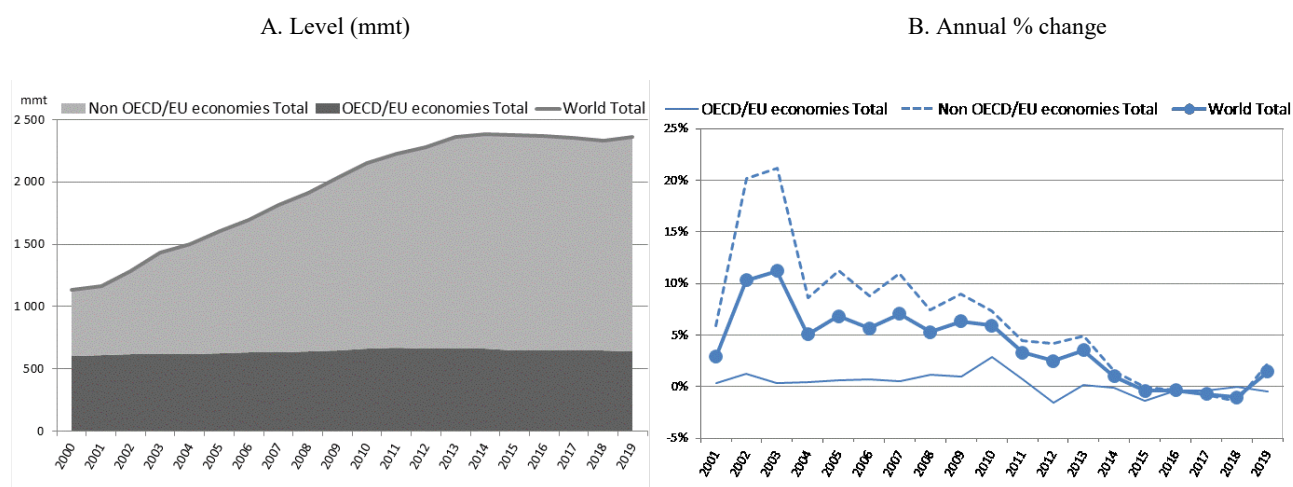
Source: OECD.

2. The latest developments in global steelmaking capacity

2.1. Global summary

Global steelmaking capacity (in nominal crude terms) decreased from 2015 to 2018, but the latest available information (as of December 2019) suggests that capacity increased in 2019 for the first time since 2014 (Figure 2). The OECD has revised its 2019 figures for global steelmaking capacity to 2 362.5 million metric tonnes (mmt) to incorporate new information on closures that was not previously available as well as updated information on the status of certain investment projects.² Moreover, revisions to the aggregate capacity figures for the People’s Republic of China (hereafter “China”), the United States, Mexico, Japan, Korea, and several other economies on the basis of the plant and firm level data contributed to the upward revision of the global steelmaking capacity figure for 2019³ and in previous years. The net capacity change in 2019, taking into account new capacity additions and closures, brings current global steelmaking capacity up to 2 362.5 mmt, representing a 1.5% increase from the level at the end of 2018.

Figure 2. Evolution of crude steelmaking capacity in OECD/EU economies and non OECD/EU economies



Note: Capacity data reflect information available to December 2019.

Source: OECD

2.2. Regional capacity developments

2.2.1. Latest developments

Table 1 provides recent capacity developments by region and presents potential additions of capacity over the next three years. In 2019, most of the capacity additions took place in Asia, where an additional 30.4 mmt of capacity (+1.9%) was deployed in 2019. Steelmaking capacity also increased in Africa (2.4 mmt, i.e. 5.9%), the CIS (1.5 mmt, i.e. 1.1%), Europe (0.7 mmt, i.e. 0.3%) and the Middle East (2.8 mmt, i.e. 4.5%) On the other hand, steelmaking capacity in the North American Free Trade Agreement (NAFTA) region

decreased in 2019, doing so by 3.8 mmt (-2.5%). In the Latin America and Oceania regions, neither new investments nor permanent closures were observed during 2019 from the sources used to update the OECD's capacity monitoring databases.

Table 1. Current nominal capacity and potential gross capacity additions by region

	nominal capacity(mmt)	nominal capacity(mmt)	% change	Potential gross capacity additions in 2020-22 (mmt)		Capacity in 2022 (mmt)		% change expected (2019 vs 2022)	
	2018	2019 (A)	2019-2018	Underway (B)	Planned (C)	Low (A)+(B)	High (A)+(B)+(C)	Low	High
Africa	41.4	43.9	5.9%	1.9	0.8	45.7	46.5	4.2%	6.0%
Asia	1 574.4	1 604.8	1.9%	27.7	3.0	1 632.5	1 635.5	1.7%	1.9%
CIS	139.3	140.8	1.1%	1.9	3.2	142.7	145.9	1.3%	3.6%
Europe	274.0	274.7	0.3%	3.7	0.0	278.4	278.4	1.3%	1.3%
EU	216.4	216.4	0.0%	0.2	0.0	216.7	216.7	0.1%	0.1%
Other Europe	57.5	58.2	1.2%	3.5	0.0	61.7	61.7	6.0%	6.0%
Latin America	74.2	74.2	0.0%	0.2	1.3	74.4	75.7	0.3%	1.9%
Middle East	62.3	65.1	4.5%	19.6	6.0	84.7	90.6	30.1%	39.3%
NAFTA	156.5	152.6	-2.5%	3.3	5.9	155.9	161.8	2.1%	6.0%
Oceania	6.4	6.4	0.0%	0.0	0.0	6.4	6.4	0.0%	0.0%
OECD/EU economies Total	644.6	641.4	-0.5%	7.0	5.9	648.4	654.3	1.1%	2.0%
Non OECD/EU economies Total	1 683.9	1 721.1	2.2%	51.2	14.2	1 772.2	1 786.4	3.0%	3.8%
World Total	2 328.4	2 362.5	1.5%	58.2	20.1	2 420.6	2 440.8	2.5%	3.3%

Note: Capacity data reflects all information on changes up to December 2019. In the table, "Europe" includes both OECD/EU economies and non OECD/EU economies in Europe, as well as Turkey. Please see Annex C for the detailed capacity data by economy. The European Union (EU) is a member of the Steel Committee and accordingly this data includes all EU Member States.

Source: OECD

2.2.2. Gross capacity additions expected in 2020-2022

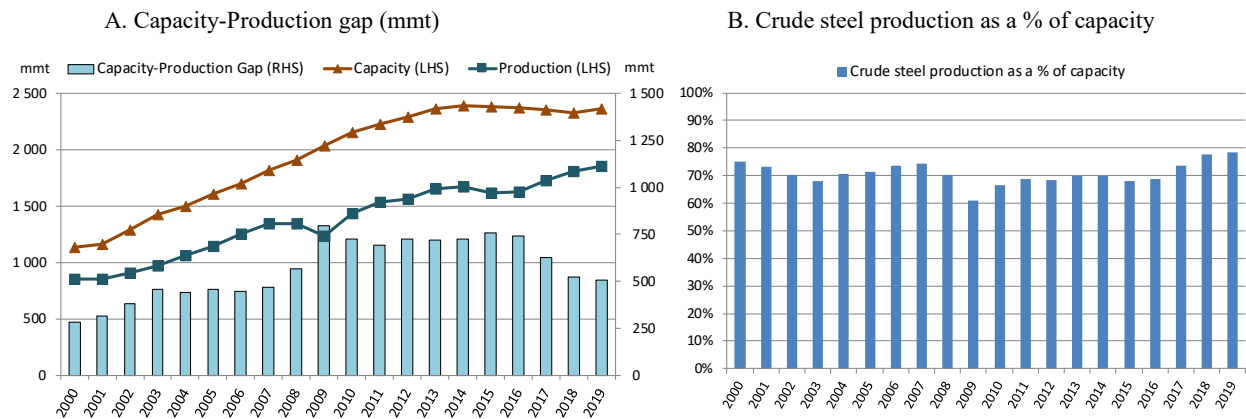
Information on announced investment projects suggests that, globally, 58.2 mmt of gross capacity additions are currently underway and could come on stream during the three-year period of 2020-22. An additional 20.1 mmt of capacity additions are currently in the planning stages for possible start-up during the same period (see Table 1).

In particular, Asia and the Middle East region may experience a considerable increase in steelmaking capacity over the next few years if all the projects current under way or planned are ultimately realised. Over 27 mmt and 19 mmt of gross capacity additions are currently underway for start-up during 2020-22 in Asia and the Middle East region, respectively, with an additional 3.0 mmt and 6.0 mmt in the planning stages in these regions, respectively. Europe, NAFTA, Africa, the CIS, and Latin America could also see an increase in capacity, with 3.7 mmt, 3.3 mmt, 1.9 mmt, 1.9 mmt and 0.2 mmt of gross additions currently underway in each region, respectively. Additionally, there are plans in each of these regions to add several million tonnes of capacity during the 2020-22 period. Currently, there are no capacity investment projects in Oceania.

2.3. The gap between global capacity and production

The gap between global capacity and production narrowed between 2016 and 2019 as a result of the slight decrease in global crude steelmaking capacity (i.e. by -0.2% from 2016 to 2019) and the increase in world steel production (13.6% in the same period). In 2019, global capacity was 2 362.5 mmt and production was 1 848.5 mmt, with the gap between the two falling to 513.9 mmt in 2019, from 520.0 mmt in 2018 (Figure 3.A). World steel production as a share of capacity has risen slightly, from 77.7% in 2018 to approximately 78.2% in 2019 (Figure 3.B).

Figure 3. Global crude steelmaking capacity and crude steel production



Note: Capacity data reflect information up to December 2019. Annual production data for 2019 are based on the press release of 27 January 2020 by the World Steel Association (World Steel Association, 2020^[1]). Annual production data from 2000 to 2018 are from “Steel Statistical Yearbook 2019”, published by the World Steel Association. See Annex D for a table with data on global crude steelmaking capacity and production from 2000 to 2019 (World Steel Association, 2019^[2]).

Source: OECD for capacity and World Steel Association for production.

3. A review of regional capacity developments

3.1. Africa

Several new investment projects are already underway or planned in Africa, mainly in North African economies. As a result, steelmaking capacity in Africa could grow from 43.9 mmt in 2019 to 45.7 mmt in 2022 (+4.2%), in view of projects that are already underway. Qatari Steel (AQS), which is a joint venture between Algeria's IMETAL and Qatar's Qatar Steel, started to operate a new Electric Arc Furnace (EAF) plant in Algeria with a capacity of 2.2 mmt in November of 2019 (Metal Expert, 2019^[3]). Morocco's Riva Industries has plans to install a new EAF with a capacity of 0.8 mmt, which are scheduled to begin operation in 2020 (Metal Expert, 2019^[4]). In addition, Namibia's Groot Group started the construction of the country's first steelmaking plant with a capacity of 1.0 mm in the Oshana region, which is planned to be completed in 2022 (Metal Expert, 2020^[5]).

Some new capacity installations are, however, facing delays in the region. The new EAF facility which was planned to be built by Algeria's ETRHB in 2020 has been delayed due to internal issues (Metal Expert, 2019^[6]). Also, Egypt's Ezz Rolling Mills (ERM) postponed the start of the operations of a new EAF plant with capacity of 0.85 mmt from 2019 to 2020 (Metal Expert, 2020^[7]).

3.2. Asia and Oceania

Steelmaking capacity in Asia increased by 30.4 mmt to 1 604.8 mmt in 2019 (+1.9%), after declining between 2015 and 2018. In addition, there are several investment projects underway or planned which are expected to become operational during the period 2020-2022. The projects that are now underway could add an additional 27.7 mmt of steelmaking capacity by 2022 (in gross terms), bringing Asia's total capacity to 1 632.5 mmt (+1.7%) in the absence of closures. No new investments are underway or planned in Oceania, according to information from the publicly available sources used to update the OECD's monitoring databases.

Steelmaking capacity in China has declined significantly in recent years. OECD data, as reported in Annex C, show that capacity in China fell by 87.0 mmt between 2016 and 2018. Government documents report that capacity reductions are taking place in line with the targets set (NDRC, 2019^[8]) and that efforts continued in 2019 (NDRC, 2019^[9]). For example, the Hebei provincial government, China's largest steel producing province, has announced targets for reducing steelmaking capacity by an additional 14 mmt per year in 2019 and 2020 (a total of 28 mmt of steelmaking capacity over the two years) on top of the already achieved targets (Hebei Metallurgical Industry Association, 2019^[10]).⁴

As described in the last document covering steelmaking capacity developments [[DSTI/SC\(2019\)12/REV1](#)], closures of illegal induction furnace equipment (IF) not accounted for in the official steelmaking capacity statistics were reported to have reached around 140 mmt (MIIT, 2018^[11]). However, since almost all of these induction furnaces operated illegally, official steelmaking capacity figures did not exist when they operated. It is extremely difficult to verify these figures because, to the Secretariat's knowledge, there are no other sources of hard data for capacity reductions of induction furnaces to compare and verify this number with. Box 2, which updates the information provided in the last document on steelmaking capacity developments, overviews actions reportedly taken for

the elimination of illegal IF capacity and Annex E provides detailed information and updates on global IF steelmaking capacities.

Box 2. Actions for the elimination of illegal IF capacities in China

China has reportedly made many efforts to close illegal induction furnace (IF) steelmaking capacity. According to the definition used by the Chinese government since 2002, these IF steel production units, called “ditiaogang (地条钢)” in Chinese, which melt ferrous scrap to produce steel, do not allow for effective control over the chemical composition and quality of the steel produced. Furthermore, these IF producers usually do not have refining and quality inspection equipment. Therefore, the steel produced can raise a number of quality-related concerns, notably if their output is branded and sold as quality steel products.

According to China Iron and Steel Association (CISA) guidelines, only three uses of IFs are deemed legal: i) casting, ii) making high-quality steel and ferroalloys with specific properties, and iii) stainless and high-alloy steelmaking. CISA has proposed that any IF producers which are not included in these categories should be categorised as “ditiaogang”, and should be eliminated, regardless of whether the IF is new, whether the IF producers have equipment for environmental protection, and regardless of the scale of the company (CISA, 2017).

The Chinese Ministry of Industry and Information Technology (MIIT) reported that China had eliminated 140 mmt of “ditiaogang” capacities in 2017 (MIIT, 2018). Moreover, the National Development and Reform Commission (NDRC) reportedly carried out nationwide inspections in May and June 2018 to ensure the effective closure of these capacities, including by preventing them from restarting operations and enforcing the elimination of closed IFs (NDRC, 2019a). Furthermore, NDRC reports that it carried out inspections to prevent the re-start of IFs in Guizhou and Yunnan provinces in September 2019 (NDRC, 2019_[12]).

There are a number of new investments in greenfield projects, most of which are related to China’s replacement measures for outdated and small steel plants, especially in the eastern and southern coastal areas of China (OECD, 2019_[13]). These investments are aimed at facilitating access to imported raw materials, as well as enabling the production of high value-added steel products to meet demand for flat products in, for example, the automotive and home appliance industries.⁵

With regard to investments in BOF capacity, Shandong Iron and Steel Group has commissioned new BOF facilities with a capacity of 4.36 mmt at the Rizhao steelworks, in Shandong province (Platts, 2019_[14]). In addition, Shougang Group completed an expansion project in its subsidiary, Shougang Jingtang United Iron and Steel (Shougang Jingtang). This project entails the installation of BOF facilities with a capacity of 4.0 mmt in Caofeidan port, Hebei province (Platts, 2019_[14]). Moreover, Guangxi Liuzhou Iron and Steel Group commissioned new BOF facilities with capacity of 14.7 mmt in the coastal city of Fangchenggang, in Guangxi province (Guangxi Liuzhou Iron and Steel, 2019_[15]). In addition, Liu’an Steel Holdings in Anhui province installed a new BOF mill with a capacity of 3.2 mmt (Platts, 2019_[16]). In March 2019, Baosteel Zhanjiang Iron and Steel has started

the expansion of its BOF steelmaking capacity by an additional 3.6 mmt, which is scheduled to become operational in March 2021 (ME, 2018_[17]).

With regard to investments in EAF capacity, Fujian Dingsheng Iron and Steel is building an EAF facility with capacity of 1.725 mmt that will be operational in 2020 (Henan Province SME Public Platform, 2019_[18]).

In addition to these projects, there are a number of projects reported in the interim capacity report [[DSTI/SC\(2019\)12/REV1](#)] which were originally planned to start operations in 2019, but the Secretariat has not yet been able to confirm the start of operations at these plants. These include: HBIS Laoting Steel with BOF capacity of 7.47 mmt, Shanxi Jinnan Iron and Steel with BOF capacity of 3.4 mmt, Shaanxi Hanzhong Iron and Steel with EAF capacity of 0.7 mmt, as well as Yaan Anshan Iron and Steel with EAF capacity of 0.83 mmt.⁶

In November 2019, China's National Development and Reform Commission, the Ministry of Industry and Information Transformation, and the National Bureau of Statistics jointly issued a notice requiring steel companies via local governments to conduct a study and submit a report on the capacity status and production changes in their facilities over the last three years. The aim of this investigation was to review the changes in capacity and equipment in China's steel sector since 2016, according to the notice. In these reports, causes should be analysed for steel companies that have changes in production capacity, growth in production volume of more than 10% in the first nine months of 2019, year-on-year, or whose production capacity utilisation rate in the first nine months of 2019 reached more than 100%. Indeed, information in the notice revealed that utilisation rates at some steel companies had soared to over 150% in 2019 (Reuters, 2020_[19]).

The China Iron and Steel Association (CISA) has noted that stronger-than-expected growth in real estate activity was the main driver of steel demand growth in 2019, while also noting that China's steel demand would plateau over the longer term. As such, CISA warned about the risks of over-investment in the steel sector and associated industries (Platts, 2019_[20]).

Steelmaking capacity in India has been expanding rapidly in recent years, and the country has recently become the second largest economy in terms of capacity. Further growth is expected in the short and medium term to meet steel demand for infrastructure projects. For example, the National Mineral Development Corporation (NMDC) is constructing a greenfield steelworks in the state of Chhattisgarh, with BOF capacity of 3 mmt, scheduled to become operational in 2020 (Metal Expert, 2019_[21]). JSW Steel is proceeding with an expansion project of BOF facilities at its Dolvi works in Maharashtra, which is expected to add 5.0 mmt of capacity by 2020 (JSW Steel, 2019_[22]). JSW Steel has plans for other greenfield projects in India to achieve additional capacity totalling 45 mmt in the period until 2031, but further details are not available yet (JSW Steel, 2019_[22]). In addition, Tata Steel also started construction of an expansion project at its Kalinganagar works in Odisha that will add 5.0 mmt BOF of capacity by 2022 (Tata Steel, 2019_[23]). Luxembourg's ArcelorMittal has a plan to establish a greenfield steel mill in the state of Karnataka, with a capacity of 6.0 mmt, but the construction schedule as well as the steelmaking technology are still unknown.⁷ Overall, India may see its capacity possibly reaching 142.1 mmt by 2022, based on projects currently underway (i.e., not including planned projects) and in the absence of closures.

Crude steelmaking capacity has also expanded rapidly in the Association of South East Asian Nations (ASEAN) region over the past decade and is expected to continue increasing over the next three-year period. Steelmaking capacity in ASEAN-6 could increase from

61.5 mmt in 2019 to 68.3 mmt by 2022 (+11.1%), based only on projects currently underway (excluding planned projects) and in the absence of closures.⁸

In the Philippines, SteelAsia Manufacturing is constructing a new 0.8 mmt EAF plant at the Compostela Works in Cebu province, which is expected to begin operation in 2020 (Metal Expert, 2018_[24]). SteelAsia Manufacturing also started the construction of a greenfield steelworks in Lemery, Batangas, with EAF capacity of 0.5 mmt that is expected to become operational in 2022 (Metal Expert, 2019_[25]). Viet Nam's Hoa Phat Group commissioned a new integrated steel plant with BOF capacity of 2.0 mmt in the Dung Quat Economic Zone, Quang Ngai province, in 2019 (Metal Expert, 2019_[26]). Hoa Phat Group also has plans to add 2.0 mmt of BOF capacity at the same production site (Metal Expert, 2019_[26]). There are also a number of investments in IF technology taking place in ASEAN-6 economies. Although information about these investments is scarce and difficult to verify, Annex E includes an indication of IF capacities in the ASEAN region.

Steel demand growth is attracting foreign investors to the ASEAN and South Asian regions, with several new investment projects supported by Chinese companies. For instance, in Indonesia, Gunung Gahapi Sakti (GGS) commissioned a new EAF plant with 0.5 mmt of capacity in 2019, as part of a joint venture with China's Nanjing Iron and Steel, located at Medan in north Sumatra (Metal Expert, 2019_[27]). Dexin Steel Indonesia, a joint venture between China's Delong Holdings Limited (45%), China's Shanghai Decent Investment Group (43%) and Indonesia's PT Indonesia Morowali Industrial Park (12%), is proceeding with construction of a new 3.5 mmt BOF steel mill in Morowali Industrial Park, located in Central Sulawesi province, with the start of production scheduled for 2020 (Platts, 2019_[28]). Moreover, Shaanxi Iron and Steel Group has plans to develop a new steel mill in Indonesia, with steelmaking capacity of 7.5 mmt. However, details about this project are still undisclosed (Metal Expert, 2018_[29]).

In the Philippines, China's HBIS Group, Huili Investment Fund Management, the Philippine's SteelAsia Manufacturing Corporation and PHIVIDEC Industrial Authority started the construction of a new steel plant in Misamis Oriental province, and steelmaking capacity would eventually reach 8.0 mmt after the two phases are concluded. However, the completion date of this project is still unknown (SteelAsia Manufacturing, 2019_[30]).

In Malaysia, Hebei Xinwuan Steel Group and Metallurgical Corporation of China (MCC) has plans to construct a new 5.0 mmt steel plant in Sarawak State (MCC, 2019_[31]). Furthermore, Chinese investors Metallurgical Corporation, CCCC International Investment Holding and Wenan Iron and Steel Co. announced their plans to build a new integrated steel mill with a capacity of 6.5 mmt in Samalaju Industrial Park in Bintulu. This project is expected to start in 2020 (Metal Expert, 2019_[32]).

In Myanmar, the subsidiary of Kunming Iron and Steel Group Company signed an agreement with the Myanmar Steel Association to build a new 4.0 mmt steelmaking plant. The schedule of this project has not been specified yet (Metal Expert, 2019_[33]).⁹

Elsewhere in Asia, Bangladesh Steel Re-Rolling Mills (BSRM) and GPH Ispat commissioned new steelmaking facilities in 2019, namely an IF plant with 0.9 mmt of capacity and an EAF plant with 0.815 mmt of capacity (Metal Expert, 2019_[34]). In Pakistan, Amreli Steels and Al-Haj Asia Star Steel commissioned new IF capacity projects with capacities of 0.2 mmt and 0.48 mmt, respectively, in 2019 (Metal Expert, 2019_[35]) (Metal Expert, 2019_[36]). Ittehad Steel is also expanding its IF capacity by an additional 0.6 mmt, with production scheduled to start in 2021 (Metal Expert, 2019_[27]). Bhutan's Druk Holding and Investments Limited (DHI) is working together with its Indian investor Mr. Dilip

Kumar Goenka to construct a greenfield steel plant with an IF capacity of 0.2 mmt in the Motanga Industrial Park of Bhutan. This project is scheduled to be completed by 2020 and could be the first-ever steelmaking plant established in Bhutan. According to DHI, this plant will produce for export to the northeast region of India (Druk Holding and Investments Limited, 2019^[37]) (Metal Expert, 2018^[38]).

3.3. CIS

In the Commonwealth of Independent States (CIS) region, Russian steelmaker Tulachermet-Steel installed a BOF with 1.5 mmt of capacity in the Central Federal District in 2019 (Metal Expert, 2019^[39]). Russian NLMK is proceeding with the expansion of BOF capacity by 1.5 mmt at its Lipetsk mill, which expected to be completed in late 2020 (NLMK, 2019^[40]). In addition, Azerbaijan's Baku Steel Company will install a new EAF facility in Ganja, Azerbaijan. The figure for steelmaking capacity is still unknown, but the construction is to be completed in 2022 (Metal Expert, 2019^[41]). Taking only the projects that are underway into account, the CIS region's steelmaking capacity could increase from 140.8 mmt in 2019 to 142.7 mmt (+1.3%) in 2022 in the absence of any further closures. Meanwhile, Kyrgyz Metal in Kyrgyzstan cancelled the country's first steelmaking plant with an EAF capacity of 0.12 mmt due to financial issues (Metal Expert, 2019^[42]).

3.4. Europe

Steelmaking capacity in the regional aggregate defined as Europe, which includes Turkey, could increase from to 274.7 mmt in 2019 to 278.4 mmt by 2022 (+1.3%), based on information available on investments that are underway but excluding planned projects. Several investments are underway in Turkey; for example, Kardemir installed a new BOF in Karabuk province in 2019, with a capacity of 0.7 mmt (Platts, 2019^[43]). Mescier Iron and Steel is constructing a new EAF facility with capacity of 1.0 mmt in Bartin, in northern Turkey, which are now expected to start operating in 2020 (Metal Expert, 2019^[44]). In addition, Tosyali Holding is proceeding with the construction of a new EAF plant located along the Iskenderun Bay, with the capacity to produce 2.5 mmt of crude steel (Tosyali Holding, 2019^[45]).

In the European Union, voestalpine is seeing the construction of a new EAF in Kapfenberg, Austria. The capacity would be 0.2 mmt and the target completion date is 2021 (voestalpine, 2020^[46]). Liberty House Group is planning to install a new EAF in Newport, the United Kingdom, but the capacity and completion time is unclear (Liberty House Group, 2018^[47]). Van Merksteijn International in the Netherlands intended to start construction of a new EAF with a capacity of 1.0 mmt in 2019, but they decided to postpone this plan and now the timeline is undecided (Metal Expert, 2019^[48]).

3.5. Latin America

In Latin America, Bolivia is seeing the construction of the country's first steelmaking plants. Las Lomas has started the construction of the country's first steelmaking plant with a capacity of 0.2 mmt in Buena Vista, Santa Cruz province. This plant was originally expected to start operations in 2019, but the actual completion time is unclear (Metal Expert, 2018^[49]). In addition, Empresa Siderurgica del Mutun plans to install a new EAF plant with a capacity of 0.19 mmt in El Mutun, Santa Cruz. Construction of the plant started in 2019 and operations would begin in 2022 (Platts, 2019^[50]). This project is supported by

China's Sinosteel Equipment, which would help with the construction of the facilities, conduct trial runs and provide operational assistance (Sinosteel Equipment, 2016_[51]).

Elsewhere in the region, Peru's Aceros Arequipa has plans to replace its current 0.85 mmt EAF with a new 1.2 mmt EAF by 2020 (Metal Expert, 2019_[53]).

Taking into account the projects that are underway, steelmaking capacity in Latin America may increase by 0.2 mmt (+0.3%) in the period 2020-22, to a level of 74.4 mmt in 2022, if those projects are realised and in the absence of closures.

3.6. Middle East

Steelmaking capacity has increased rapidly over the past decade in the Middle East, from 33.1 mmt in 2010 to 65.1 mmt in 2019 (+96.7%). Rapid growth is expected to continue over the next few years mainly due to capacity expansions in Iran. Steelmaking capacity could increase by an additional 19.6 mmt (+30.1 %) by 2022 compared with the level of 2019 if all the projects that are underway come on stream and in the absence of closures.

Looking at developments in Iran, a total of 2.8 mmt of steelmaking capacity started operations in 2019. The largest steelmaking project to come on stream was the Jahan Foolad Sirjan Steel Complex, where 1.2 mmt of capacity was installed in 2019 (Metal Expert, 2019_[54]). Other notable projects include investments by Bistoun Steel, Arvand Jahanara Steel, and Kabkan steel, each with steelmaking capacities of 0.25 mmt, 1.2 mmt, and 0.15 mmt, respectively (Metal Expert, 2019_[55]) (Metal Expert, 2019_[56]) (Metal Expert, 2019_[57]).

On the other hand, there have been some suspensions of projects, such as Aria Zob Steel and Arian Steel, which had originally planned to add capacities in 2019 but stopped construction due to financial issues (Metal Expert, 2019_[58]). Furthermore, Kish South Kaveh Steel, West Alborz Steel and Zarand Iron and Steel postponed to 2020 the start-up of new EAF plants with capacities of 0.2 mmt, 1.0 mmt, and 1.7 mmt, respectively. (Metal Expert, 2020_[59]) (Metal Expert, 2019_[60]) (Metal Expert, 2019_[61]). Kavir Damghan Steel has also postponed (indefinitely) the start-up of a new EAF plant with a capacity of 0.2 mmt, which was originally planned for 2019 (Metal Expert, 2019_[62]).

These developments indicate the potential uncertainties surrounding the implementation of investment projects. However, assuming that all projects that are currently underway are completed as scheduled, Iran's nominal crude steelmaking capacity would reach 54.4 mmt by 2022, i.e. an increase of 51% when compared to the capacity level of 36.0 mmt observed at the end of 2019. This would mean that Iran would become the seventh largest steelmaking country in the world during this period. In view of the rapid capacity growth being observed in Iran, the Secretariat will make efforts to investigate trends occurring in that economy in more detail in subsequent reports.

Elsewhere in the region, Oman's Moon Iron and Steel (MISCO) is building a new 1.2 mmt EAF plant, which is expected to be operational in 2020 (Metal Expert, 2019_[63]). At the same time, the construction of a new EAF facility with a capacity of 0.6 mmt by Saudi Arabia's Gulf Tubing Company is facing delays due to financial issues (Metal Expert, 2019_[58]). Iraq's United Brothers Holdings is installing new EAF facilities in Basra with the capacity to produce 0.5 mmt of crude steel, however, the completion time is unclear due to political instability in the country (Metal Expert, 2019_[64]).

3.7. NAFTA

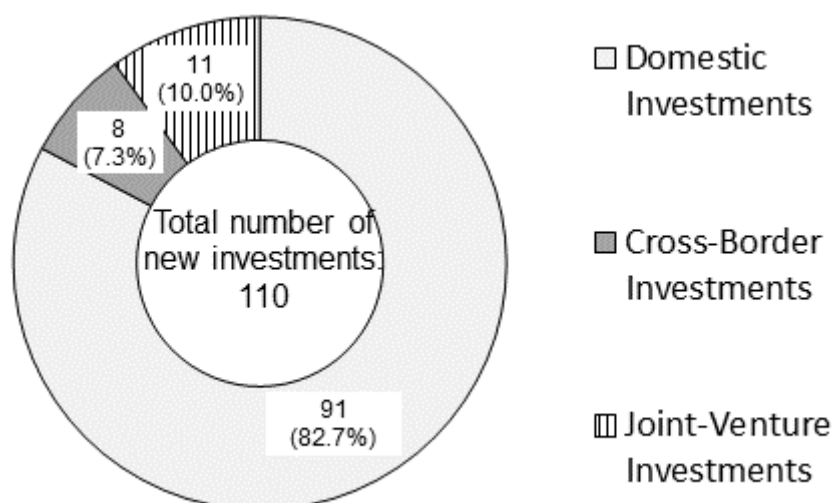
In the NAFTA region, several new investments could lead to a slight increase in steelmaking capacity in the coming years. In the United States, Nucor Corporation is installing two new EAF facilities each with capacities of 0.3 mmt. One was installed in Sedalia, Missouri, at the end of 2019, and the other will be located in Frostproof, Florida, which is scheduled to start operations in 2020 (Nucor, 2019_[65]). Nucor Corporation has also announced plans to expand the steelmaking capacity of its Gallatin mill in Ghent, Kentucky by 1.09 mmt, with a view to start operation in 2021 (Danieli, 2019_[66]). In addition, Big River Steel has launched the construction of a new EAF to expand steelmaking capacity at the Arkansas mill by around 1.5 mmt, which expected to become operational in 2020 (Big River Steel, 2018_[67]). In February 2019, United States Steel Corporation (U.S. Steel) restarted the construction of a new EAF facility with a capacity of 1.45 mmt at its Fairfield Works, Alabama, which is expected to start producing steel in 2020 (U.S. Steel, 2019_[68]). Steel Dynamics has a plan to install a new EAF with a capacity of around 2.7 mmt in Sinton, Texas in 2021 (Steel Dynamics, 2019_[69]). Australia's BlueScope Steel has a plan to expand steelmaking capacity by installing a new EAF at its subsidiary North Star in Delta, Ohio. The capacity additions would be 0.85 mmt and the target commissioning is in mid-2022 (BlueScope Steel, n.d._[70]). Conversely, India's JSW Holdings has suspended a plan to install a new EAF facility at its subsidiary JSW USA in Baytown, Texas (Metal Expert, 2019_[71]). Moreover, AK Steel closed BOF facilities at its Ashland Works in Kentucky, with capacity of 2.5 mmt (AK Steel, 2019_[72]).

As a result of these changes, steelmaking capacity in the NAFTA region could increase by 3.3 mmt (+2.1%) in 2022 compared to the level in 2019, taking into account the projects that are underway. This would lead to a rise in the level of NAFTA's steelmaking capacity to 155.9 mmt.

4. The latest developments in cross-border investments

Figure 4 shows the share of domestic and cross-border investments in steelmaking capacity. In total, there are 110 new steelmaking capacity projects around the world, classified as underway or planned, which are scheduled to become operational in 2019 or later. This includes projects that have started operations in 2019, as well as projects for which the start date is not available. Of these projects, domestic steelmakers are the investors/owners in 91 (82.7%) of the cases. Of the remaining steelmaking capacity projects, 8 (7.3%) entail cross-border investments, representing an investment that is based wholly on one or on several foreign investors/owners, and 11 (10.0%) are structured as joint ventures (JV) between domestic and foreign investors/owners.

Figure 4. The share of domestic and cross-border investments in new steelmaking capacity projects underway or planned for 2019 or later



Note: This figure includes all new investment projects that are underway or planned, and which are scheduled to become operational in 2019 or later — including projects that have started operation in 2019, as well as projects for which the start date is not available. It does not include cancelled projects. A cross-border investment represents an investment that is based wholly on one or several foreign investors/owners. A joint venture, on the other hand, involves both foreign investors/owners and domestic counterparts. Please see Annex A for details on the plant-level investments and their respective investors/owners.

Source: OECD

Table 2 lists the cross-border investments by region. Asia is the largest investment destination, accounting for five cross-border and nine joint venture (JV) investments between domestic and foreign investors. Africa attracts one JV investment. Latin America has one cross-border investment and one JV, while NAFTA is the destination of two cross-border investments. The CIS, Middle East, Europe and Oceania regions currently do not have any cross-border investments or JV investments.

Table 2. Domestic and cross-border investments in new steelmaking capacity projects

Underway and planned investments for 2019 or later

Region where the investment is taking place	Domestic Investments		Cross-Border Investments		Joint-Venture Investments	
	Number	Capacity (mmt)	Number	Capacity (mmt)	Number	Capacity (mmt)
Africa	6	4.6	0	0.0	1	2.2
Asia	33	99.1	5	27.1	9	27.2
CIS	6	6.6	0	0.0	0	0.0
Europe	6	5.4	0	0.0	0	0.0
Latin America	2	1.5	1	8.0	1	0.2
Middle East	31	32.7	0	0.0	0	0.0
NAFTA	7	8.7	2	0.9	0	0.0
Oceania	0	0.0	0	0.0	0	0.0
World Total	91	158.4	8	36.0	11	29.6

Note: This table includes all new investment projects that are, underway or planned, and which are scheduled to become operational in 2019 or later — including projects that have started operation in 2019, as well as projects for which the start date is not available. It does not include cancelled projects. A cross-border investment represents an investment that is based wholly on one or several foreign investors. A joint venture, on the other hand, involves both a foreign investor and a domestic counterpart. Please see Annex A for details on the plant-level investments and their respective investors/owners.

Source: OECD

Table 3 provides a two-way matrix of the cross-border and joint venture investments by economy. Chinese companies are involved in three cross-border investments and participate in eight JV investments abroad. ASEAN is the most attractive region for Chinese companies, followed by South Asia and Latin America. Cambodia and Malaysia are destinations for one Chinese cross-border investment each, while Indonesia is the location for three JV investments with Chinese companies. In the Philippines, there are two JV investments with Chinese companies. Myanmar, Pakistan and Bolivia have one JV investments with Chinese companies each, while Brazil is the destination for one Chinese cross-border investment.

Regarding other investments, two Chinese Taipei companies and a Japanese company are jointly investing in two cross-border projects in Viet Nam.¹⁰ An Indian company has one cross-border investment in the United States. Another Indian company is involved in one joint venture project with a Bhutanese counterpart. Investors from Luxembourg and Australia have one cross-border investment each, respectively in India and in the United States. Investors from Korea and Qatar have one joint venture project each, respectively with companies in Indonesia and Algeria.¹¹

Table 3. Cross-border and joint venture investments in new steelmaking capacity projects

A. Cross-Border Investments

		Location of Investments											
		Asia								Latin America		NAFTA	
		Cambodia		India		Malaysia		Viet Nam		Brazil		United States	
Origins of Investments: firm based in		Number	Capacity (mmt)	Number	Capacity (mmt)	Number	Capacity (mmt)	Number	Capacity (mmt)	Number	Capacity (mmt)	Number	Capacity (mmt)
Asia	China	1	3.1	0	0.0	1	5.0	0	0	1	8.0	0	0.0
	Chinese Taipei / Japan	0	0.0	0	0.0	0	0.0	2	13.0	0	0.0	0	0.0
	India	0	0.0	0	0.0	0	0	0	0	0	0.0	1	n/a
Europe	Luxembourg	0	0.0	1	6.0	0	0	0	0	0	0.0	0	0.0
Oceania	Australia	0	0.0	0	0.0	0	0	0	0	0	0.0	1	0.9

B. Joint Venture Investments

		Location of Investments													
		Africa		Asia								Latin America			
		Algeria		Bhutan		Indonesia		Myanmar		Pakistan		Philippines		Bolivia	
Foreign JV partner: firm based in		Number	Capacity (mmt)	Number	Capacity (mmt)	Number	Capacity (mmt)	Number	Capacity (mmt)	Number	Capacity (mmt)	Number	Capacity (mmt)		
Asia	China	0	0.0	0	0.0	3	11.5	1	4.0	1	0.5	2	8.0	1	0.2
	India	0	0.0	1	0.2	0	0.0	0.0	0.0	0	0.0	0	0.0	0	0.0
	Korea	0	0.0	0	0.0	1	3.0	0.0	0.0	0	0.0	0	0.0	0	0.0
Middle East	Qatar	1	2.2	0	0	0	0	0	0	0	0	0	0	0	0.0

Note: Capacity figures are in mmt (millions of metric tonnes). These tables include all new investment projects that are underway or planned, and which are scheduled to become operational in 2019 or later — including projects that have started operation in 2018, as well as projects for which the start date is not available. It does not include cancelled projects. A cross-border investment represents an investment that is based wholly on one or several foreign investors. A joint venture, on the other hand, involves both a foreign investor and a domestic counterpart. Please see Annex A for details on the plant-level investments and their respective investors/owners.

Source: OECD

Annex A. AVAILABLE EVIDENCE OF PLANT LEVEL INVESTMENTS AND OWNERS

Table 4. Investment data

REGION	ECONOMIES	LOCATION	COMPANY	OWNER (ECONOMIES)	EQUIPMENT	CAPACITY	STATUS	START	SOURCES
Africa	Algeria	Bellara, Jijel	Algerian Qatari Steel	IMETAL (Algeria), Qatar Steel (Qatar)	EAF	2 200	operating	2019	Company HP, Platts
Africa	Algeria	Berrahal	ETRHB	The ETRHB HADDAD Group (Algeria)	EAF	1 150	plan	n/a	Company HP, Metal Expert
Africa	Morocco	Jorf Lasfar	Riva Industries	Meski Holding (Morocco)	EAF	800	plan	2020	Metal Expert
Africa	Namibia	Oshikango, Ohangwena region	Groot Group	Groot Group (Namibia)	EAF	1 000	underway	2022	Company HP, Metal Expert
Africa	Egypt	Sokhna, Suez	Ezz Rolling Mills (ERM)	Ezz Steel (Egypt)	EAF	850	underway	2020	Platts, Metal Expert, World Steel Capacities
Africa	Egypt	Qalyubia	Delta Steel Mill	Delta Steel Mill (Egypt)	EAF	250	operating	2019	Metal Expert
Africa	Egypt	Ain Sokhna	Arabian Steel Industries	Arabian Steel Industries (Egypt)	EAF	500	underway	n/a	World Steel Capacities
Asia	Bangladesh	Masjiddah, Kumira, Sitakunda, Chittagong	GPH Ispat Ltd	GPH Ispat Ltd (Bangladesh)	EAF	815	operating	2019	Company HP, Metal Expert
Asia	Bangladesh	Chittagong	Bangladesh Steel Re-Rolling Mills (BSRM)	BSRM (Bangladesh)	IF	900	operating	2019	Metal Expert
Asia	Bhutan	Motanga Industrial Park, Samdrup Jongkhar	Druk Metallurgy Limited	Druk Holding and Investments Limited (Bhutan), Mr. Dilip Kumar Goenka (India)	IF	200	underway	2020	Company HP, Platts, Metal Expert

REGION	ECONOMIES	LOCATION	COMPANY	OWNER (ECONOMIES)	EQUIPMENT	CAPACITY	STATUS	START	SOURCES
Asia	Cambodia	Phnom Penh	Baowu Iron and Steel Group	Baowu Iron and Steel Group (China)	BOF	3 100	plan	n/a	Reuters, Metal Expert
Asia	China	Fengnan district of Tangshan	Hebei Zongheng Fengnan Steel (河北纵横集团丰南钢铁)	Sinogiant Steel Group (China)	BOF	7 700	operating	2019	Company HP, Platts, Metal Expert, Wood Mackenzie
Asia	China	Rizhao, Shandong	Shandong Iron and Steel Group	Shandong Iron and Steel Group (China)	BOF	4 360	operating	2019	Platts
Asia	China	Caofeidian port, Hebei	Shougang Jingtang United Iron and Steel (首钢京唐公司)	Shougang Group (China)	BOF	4 000	operating	2019	Platts, Metal Expert, Wood Mackenzie, China Metallurgical News (中国冶金报社)
Asia	China	Fangchenggang, Guangxi	Liuzhou Iron and Steel (柳州钢铁)	Guangxi Liuzhou Iron and Steel Group (China)	BOF	14 700	operating	2019	Platts, Wood Mackenzie, Guangxi News(广西新闻网版), Xinhuanet (新华网)
Asia	China	Liu'an City, Anhui	Liu'an Steel Holdings Co., Ltd.(六安钢铁控股集团有限公司)	Liu'an Steel Holdings Co., Ltd. (China)	BOF	3 200	operating	2019	Company HP, Platts, Wood Mackenzie, Government of Huoquiu (霍邱县人民政府)
Asia	China	Ningde, Fujian	Fujian Dingsheng Iron and Steel (福建鼎盛钢铁有限公司)	Fujian Dingsheng Iron and Steel (China)	EAF	1 725	underway	2020	Henan Province SME Public Platform(中小企业河南网), Wood Mackenzie
Asia	China	Zhanjiang, Guangdong	Guangdong Shaoguan Iron & Steel	Guangdong Shaoguan Iron & Steel (China)	BOF	3 625	underway	2021	Metal Expert
Asia	China	Laoting, Hebei	HBIS Laoting Steel(河钢乐亭钢铁)	Hebei Iron and Steel (HBIS) (China)	BOF	7 470	underway	n/a	Company HP, Platts, Metal Expert, Wood Mackenzie, Reuters
Asia	China	Shanxi	Shanxi Jinnan Iron and Steel (山西晋南钢铁集团有限公司)	Shanxi Jinnan Iron and Steel (China)	BOF	3 400	underway	n/a	Company HP, Wood Mackenzie, worldmetals (世界金属导报)
Asia	China	Hanzhong, Shaanxi	Shaanxi Hanzhong Iron and Steel (陕钢汉中钢铁有限责任公司)	Shaanxi Steel Group (China)	EAF	700	underway	n/a	Wood Mackenzie, Shaanxi Development Observation (陕西发展观察)

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REGION	ECONOMIES	LOCATION	COMPANY	OWNER (ECONOMIES)	EQUIPMENT	CAPACITY	STATUS	START	SOURCES
Asia	China	Yaan, Sichuan	Yaan Anshan Iron and Steel (四川雅安安山钢铁有限公司)	Yaan Anshan Iron and Steel (China)	EAF	830	underway	n/a	Wood Mackenzie, Yaan / Tianquan Municipal People's Government
Asia	China	Ningde, Fujian	Fujian Dingsheng Iron and Steel (福建鼎盛钢铁有限公司)	Fujian Dingsheng Iron and Steel (China)	EAF	1 725	underway	2020	Henan Province SME Public Platform(中小企业河南网), Wood Mackenzie
Asia	India	Anjar, Kutch, Gujarat	Mono Steel	Mono Steel (India)	IF	300	operating	n/a	Metal Expert
Asia	India	Dilmili, Chhattisgarh	NMDC	NMDC (India)	BOF	3 000	underway	2020	Company HP, Metal Expert
Asia	India	Dolvi, Maharashtra	JSW Steel / Dolvi works	JSW Holdings (India)	BOF	5 000	underway	2020	Company HP, Platts, World Steel Capacities
Asia	India	Kalinganagar, Odisha	Tata Steel / Kalinganagar	Tata Steel (India)	BOF	5 000	underway	2022	Company HP, Platts, Metal Expert
Asia	India	Karnataka	ArcelorMittal	ArcelorMittal (Luxembourg)	Steelmkg	6 000	plan	n/a	Company HP, Metal Expert
Asia	India	Jharkhand	JSW Steel / JSW Jharkhand Steel	JSW Holdings (India)	Steelmkg	10 000	plan	n/a	Company HP, Metal Expert
Asia	India	Salboni, West Bengal	JSW Steel / JSW Bengal Steel	JSW Holdings (India)	Steelmkg	10 000	plan	n/a	Company HP, Platts
Asia	Indonesia	North Sumatra	Gunung Gahapi Sakti (GGS)	Gunung Steel Group (Indonesia), Nanjing Iron and Steel (China)	EAF	500	operating	2019	Company HP, Metal Expert, Wood Mackenzie
Asia	Indonesia	Morowali, Central Sulawesi	PT Dexin Steel Indonesia	Delong Holdings (China), Shanghai Decent Group (China), PT. Indonesia Morowali Industrial Park (Indonesia)	BOF	3 500	underway	2020	Company HP, Metal Expert, Wood Mackenzie
Asia	Indonesia	Cilegon, West Java	Krakatau POSCO	Krakatau Steel(Indonesia), POSCO (Korea)	Steelmkg	3 000	plan	n/a	Krakatau POSCO's Presentation, World Steel Capacities, Wood Mackenzie
Asia	Indonesia	-	Shaanxi Iron and Steel Group	Shaanxi Iron and Steel Group (China)	Steelmkg	7 500	plan	n/a	Company HP, China Belt and Road Portal (一带一路网), Metal Bulletin

REGION	ECONOMIES	LOCATION	COMPANY	OWNER (ECONOMIES)	EQUIPMENT	CAPACITY	STATUS	START	SOURCES
Asia	Malaysia	Samalaju, Sarawak State	Hebei Xinwuan Steel Group and MCC Overseas Ltd	Hebei Xinwuan Steel Group(China), MCC Overseas Ltd (China)	Steelmkg	5 000	plan	n/a	Company HP, Platts, Metal Expert, Wood Mackenzie
Asia	Myanmar	-	Integrated Steel plant in Myanmar	Kunming Iron and Steel Group Company (China)	Steelmkg	4 000	plan	n/a	Metal Expert, China Metallurgical News (中国冶金报社)
Asia	Pakistan	Dhabeji	Amreli Steels / Dhabeji plant	Amreli Steels (Pakistan)	IF	200	operating	2019	Company HP, Metal Expert
Asia	Pakistan	Gadoon Industrial Estate, Swabi, Khyber Pakhtunkhwa Province	Al-Haj Asia Star Steel	Al-Haj Group (Pakistan), Hebei Xin Gang Steel Group (China)	IF	480	operating	2019	Metal Expert
Asia	Pakistan	Faisalabad	Ittehad Steel	Ittehad Steel (Pakistan)	IF	600	underway	2021	World Steel Capacities
Asia	Pakistan	Port Qasim, Karachi	Agha Steel Industries	Agha Steel Industries(Pakistan)	EAF	500	plan	n/a	Company HP, World Steel Capacities
Asia	Philippines	Bulacan, Central Luzon	SteelAsia Manufacturing	SteelAsia Manufacturing (Philippines)	EAF	800	plan	2022	Metal Exper
Asia	Philippines	Compostela, Cebu	SteelAsia Manufacturing	SteelAsia Manufacturing (Philippines)	EAF	800	underway	2020	Metal Exper
Asia	Philippines	Concepcion, Tarlac	SteelAsia Manufacturing	SteelAsia Manufacturing (Philippines)	EAF	1 200	plan	2021	Metal Exper
Asia	Philippines	Carcar, Cebu	SteelAsia Manufacturing	SteelAsia Manufacturing (Philippines)	EAF	500	plan	2021	World Steel Capacities
Asia	Philippines	Lemery, Batangas	SteelAsia Manufacturing	SteelAsia Manufacturing (Philippines)	EAF	500	underway	2022	Metal Exper
Asia	Philippines	Villanueva, Misamis Oriental	SteelAsia Manufacturing	SteelAsia Manufacturing (Philippines)	EAF	500	plan	2020	Metal Exper
Asia	Philippines	Davao, Mindanao	SteelAsia Manufacturing	SteelAsia Manufacturing (Philippines)	EAF	n/a	plan	2021	World Steel Capacities
Asia	Philippines	Misamis Oriental, Mindanao	Philippine Iron and Steel Project (Phase 1)	SteelAsia Manufacturing (Philippines), Hebei Iron and Steel (HBIS) (China), Huili Investment Fund Management Co.,Ltd (China)	Steelmkg	600	plan	n/a	Company HP, Platts, Reuters

REGION	ECONOMIES	LOCATION	COMPANY	OWNER (ECONOMIES)	EQUIPMENT	CAPACITY	STATUS	START	SOURCES
Asia	Philippines	Misamis Oriental, Mindanao	Philippine Iron and Steel Project (Phase 2)	SteelAsia Manufacturing (Philippines), Hebei Iron and Steel (HBIS) (China), Huili Investment Fund Management Co., Ltd (China)	Steelmkg	7 400	plan	n/a	Company HP, Platts, Reuters
Asia	Viet Nam	Dung Quat Industrial Park, Quang Ngai	Hoa Phat Dung Quat	Hoa Phat Group (Viet Nam)	BOF	2 000	operating	2019	Company HP, Platts, Metal Expert
Asia	Viet Nam	Dung Quat Industrial Park, Quang Ngai	Hoa Phat Dung Quat	Hoa Phat Group (Viet Nam)	BOF	2 000	underway	2020	Company HP, Platts, World Steel Capacities
Asia	Viet Nam	Nghi Son Economic Zone, Thanh Hóa province	Nghi Son Cast Iron and Steel Joint Stock Company	Nghi Son Cast Iron and Steel Joint Stock Company (Viet Nam)	IF	1 000	operating	2019	Platts
Asia	Viet Nam	Vung Ang, Ha Tinh	Formosa Ha Tinh Steel Corp	Formosa Plastics Group (Chinese Taipei), China Steel Corp (Chinese Taipei), JFE Steel Corp (Japan)	BOF	3 000	plan	n/a	Company HP, Metal Expert, World Steel Capacities
Asia	Viet Nam	Vung Ang, Ha Tinh	Formosa Ha Tinh Steel Corp	Formosa Plastics Group (Chinese Taipei), China Steel Corp (Chinese Taipei), JFE Steel Corp (Japan)	BOF	10 000	plan	n/a	Company HP, Metal Expert, World Steel Capacities
CIS	Azerbaijan	Ganja	Baku Steel Company / Azerbaijan Integrated Steel Mill Complex	Baku Steel Company (Azerbaijan)	EAF	n/a	plan	2022	Company HP, Metal Expert
CIS	Georgia	Rustavi	Rustavi Steel	Rustavi Steel (Georgia)	EAF	250	underway	2020	Metal Expert
CIS	Russia	Tula, Central Federal District	Tulachemet-Steel	Industrial Metallurgical Holdings (Russia)	BOF	1 532	operating	2019	Company HP, Ministry of Industry and Trade Russia
CIS	Russia	Lipetsk	NLMK	NLMK (Russia)	BOF	1 500	underway	2020	Company HP
CIS	Russia	Usolye-Sibirskoye	Usolye Metallurgical	Usolye Metallurgical (Russia)	EAF	120	underway	2020	World Steel Capacities

REGION	ECONOMIES	LOCATION	COMPANY	OWNER (ECONOMIES)	EQUIPMENT	CAPACITY	STATUS	START	SOURCES
CIS	Ukraine	Zaporizhzhya	Zaporizhstal Iron and Steel Works	Metinvest (Ukraine)	BOF	3 200	plan	2022	Platts, World Steel Capacities
Europe	Netherlands	Eemshaven	Van Merksteijn International	Van Merksteijn International (Netherlands)	EAF	1 000	plan	n/a	Company HP, World Steel Capacities
Europe	Turkey	Karabuk	Kardemir	Kardemir (Turkey)	BOF	700	operating	2019	Company HP, Metal Expert
Europe	Turkey	Bartın	Mescier Iron and Steel	Mescier Iron and Steel (Turkey)	EAF	1 000	underway	2020	Company HP, Platts, Metal Expert
Europe	Turkey	Iskenderun, Hatay	Toscelik profile and sheet	Tosyali Holding (Turkey)	EAF	2 500	underway	2020	Company HP, World Steel Capacities, Wood Mackenzie
Europe	United Kingdom	Newport	Liberty House Group	Liberty House Group (United Kingdom)	EAF	n/a	plan	n/a	Metal Expert
Europe	Austria	Kapfenberg	Voestalpine	Voestalpine (Austria)	EAF	205	underway	2021	Company HP
Latin America	Bolivia	San Jacinto, Buena Vista municipality, Santa Cruz district	La Siderurgica Las Lomas	Las Lomas (Bolivia)	IF	200	underway	n/a	Platts, Metal Expert
Latin America	Bolivia	El Mutún, Santa Cruz	Empresa Siderurgica del Mutun	Empresa Siderurgica del Mutun (Bolivia), Sinosteel Equipment (China)	EAF	190	underway	2022	Company HP, Metal Expert
Latin America	Peru	Pisco	Aceros Arequipa	Aceros Arequipa (Peru)	EAF	1 250	plan	2020	Company HP, Metal Expert
Middle East	Iran	Kermanshah	Bistoun Steel	Bistoun Steel (Iran)	IF	250	operating	2019	Company HP, Metal Expert
Middle East	Iran	Sirjan, Kerman	Jahan Foolad Sirjan Steel Complex (Phase 1)	Golgozar Mining and Industrial Co. (Iran)	EAF	1 200	operating	2019	Company HP, Metal Expert
Middle East	Iran	Arvand, Khoramshahr	Arvand Jahanara Steel Company (Phase 1)	Arvand Jahanara Steel Company (Iran)	EAF	1 200	operating	2019	World Steel Capacities, Metal Expert
Middle East	Iran	Arvand, Khoramshahr	Arvand Jahanara Steel Company (Phase 2)	Arvand Jahanara Steel Company (Iran)	EAF	1 200	plan	2022	World Steel Capacities, Metal Expert
Middle East	Iran	Mashhad, Razavi Khorasan	Kabkan Steel Company	Shekofteh Industrial Group (Iran)	EAF	150	operating	2019	World Steel Capacities
Middle East	Iran	Abhar, Zanjan	West Alborz Steel Co.	West Alborz Steel Co. (Iran)	EAF	1 000	underway	2020	Company HP, Metal Expert
REGION	ECONOMIES	LOCATION	COMPANY	OWNER (ECONOMIES)	EQUIPMENT	CAPACITY	STATUS	START	SOURCES

Middle East	Iran	Zarand, Kerman	Zarand Iron and Steel Company (ZISCO)	Middle East Mines Industries Development Holding Company (MIDHCO) (Iran)	BOF	1 700	underway	2020	Company HP, Metal Expert
Middle East	Iran	Bafgh, Yazd	Bafgh Mineral Complex Iron and Steel Industry Company (B-MISCO)	Bafgh Mineral Complex Iron and Steel Industry Company (B-MISCO) (Iran)	EAF	800	underway	2020	Company HP, World Steel Capacities
Middle East	Iran	Chatroud, Kerman Province	Butia Steel Company	Middle East Mines Industries Development Holding Company (MIDHCO) (Iran)	EAF	1 500	underway	2020	Metal Expert
Middle East	Iran	South Khorasan	Ghaenat Steel Complex	IMIDRO / Private section (Iran)	EAF	800	underway	2020	Company HP, Metal Expert
Middle East	Iran	Chabahar city, Sistan and Baluchestan	Makran Steel Complex	IMIDRO (Iran)	EAF	3 200	underway	2020	Metal Expert
Middle East	Iran	Malekan, Eastern Azerbaijan	Malekan Steel	Malekan Steel (Iran)	EAF	400	underway	2020	Metal Expert
Middle East	Iran	Charmahal-va-Bakhtiari	Morarakeh Steel / Sefid Dasht Steel Complex (Chaharmahal Bakhtiari)	IMIDRO (Iran)	EAF	1 000	underway	2020	Company HP, Metal Expert
Middle East	Iran	Hormozgan, Hormozgan	Mobarakeh Steel / Hormozgan Steel Complex	IMIDRO (Iran)	EAF	1 500	underway	2020	Platts, World Steel Capacities
Middle East	Iran	Mianeh, East Azerbaijan	National Iranian Steel Co (NISCO) / Miyaneh Steel Plant	IMIDRO (Iran)	EAF	800	underway	2020	MPT International, Metal Expert, Wood Mackenzie
Middle East	Iran	Fars	Neyriz Ghadir Steel Company (NGHSCO)	Ghadir International Mines and Industries Development Company (Iran)	EAF	800	underway	2020	Company HP, World Steel Capacities
Middle East	Iran	Abarkooh, Yazd	Abar Kouh Steel and Rolling	Chadormalu Mining and Industrial Co. (Iran)	EAF	600	underway	2022	Metal Expert
Middle East	Iran	Jovein, Khorasan Rezavi	Sabzevar Steel Complex	IMIDRO (Iran)	EAF	800	underway	2022	Metal Expert
Middle East	Iran	Nishapur, Razavi Khorasan province	Khayyam Steel Neyshabour	Khayyam Steel Neyshabour (Iran)	EAF	800	underway	2022	Metal Expert
REGION	ECONOMIES	LOCATION	COMPANY	OWNER (ECONOMIES)	EQUIPMENT	CAPACITY	STATUS	START	SOURCES

Middle East	Iran	Qeshm Free Zone	Qeshm Steel Development Co.(QE.S.D.Co) (Phase 1)	Qeshm Steel Development Co.(QE.S.D.Co) (Iran)	EAF	1 500	plan	2021	Company HP, Platts, World Steel Capacities
Middle East	Iran	Qeshm Free Zone	Qeshm Steel Development Co.(QE.S.D.Co) (Phase 2)	Qeshm Steel Development Co.(QE.S.D.Co) (Iran)	EAF	1 500	plan	2023	Company HP, Platts, World Steel Capacities
Middle East	Iran	Sadr	Shahrood Steel Co	Shahrood Steel Co (Iran)	IF	150	plan	2021	Metal Expert
Middle East	Iran	Arvand, Khoramshahr	Arvand Jahanara Steel Company (Phase 2)	Arvand Jahanara Steel Company (Iran)	EAF	1 200	plan	2022	World Steel Capacities
Middle East	Iran	Sirjan, Kerman	Jahan Foolad Sirjan Steel Complex (Phase 2)	Golgohar Mining and Industrial Co. (Iran)	EAF	1 300	plan	2022	World Steel Capacities
Middle East	Iran	Fars	Eghlid Steel Company	Eghlid Steel Company (Iran)	EAF	1 500	plan	n/a	Platts, World Steel Capacities
Middle East	Iran	Esfahan	Natanz Steel Industries	Natanz Steel Industries (Iran)	EAF	850	plan	n/a	Metal Expert
Middle East	Iran	Kurdistan province	Kurdistan Steel	IMIDRO (Iran)	n/a	1 500	underway	2022	Company HP, Platts, Metal Expert
Middle East	Iran	Bandar Abbas	Kish South Kaveh Steel	Kaveh Pars Mining Industries Company (Iran)	EAF	1 200	underway	2020	Company HP, Metal Expert, World Steel Capacities
Middle East	Iraq	Khor Al-Zubair, Basra	State Company for Iron and Steel (SCIS)	United Brothers Holding (Iraq)	EAF	500	underway	n/a	Company HP, Metal Expert
Middle East	Oman	Sohar	Moon Iron and Steel (MISCO)	Moon Iron and Steel (MISCO) (Oman)	EAF	1 200	underway	2020	Company HP, Metal Expert
Middle East	Saudi Arabia	Ras Al-Khair	Gulf Tubing Co	Gulf Tubing Co (Saudi Arabia)	EAF	600	plan	2020	Company HP, Metal Expert
NAFTA	United States	Sedalia, Missouri	Nucor Steel Sedalia	Nucor Steel (United States)	EAF	317	operating	2019	Company HP, Metal Expert
NAFTA	United States	Frostproof, Florida	Nucor Steel Florida	Nucor Steel (United States)	EAF	317	underway	2020	Company HP, Metal Expert
NAFTA	United States	Fairfield, Alabama	U.S. Steel / Fairfield Works	U.S. Steel (United States)	EAF	1 451	underway	2020	Company HP, Metal Expert
NAFTA	United States	Osceola, Arkansas	Big River Steel	Big River Steel (United States)	EAF	1 496	underway	2020	Company HP, Metal Expert
NAFTA	United States	Baytown, Texas	JSW USA	JSW Holdings (India)	EAF	n/a	plan	n/a	Company HP, Platts, Metal Expert
NAFTA	United States	Sinton Texas	Steel Dynamics, Inc.	Steel Dynamics, Inc. (United States)	EAF	2 722	plan	2021	Company HP, Platts, Metal Expert
REGION	ECONOMIES	LOCATION	COMPANY	OWNER (ECONOMIES)	EQUIPMENT	CAPACITY	STATUS	START	SOURCES

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NAFTA	United States	Ghent, Kentucky	Nucor	Nucor Steel (United States)	EDF	1 271	plan	2021	Company HP, Metal Expert
NAFTA	United States	Brandenburg, Kentucky	Nucor	Nucor Steel (United States)	EDF	1 088	plan	2022	DANIELI, Metal Expert
NAFTA	United States	Delta, Ohio	North Star BlueScope Steel	BlueScope Steel (Australia)	EDF	850	plan	2022	Company HP, The Wall Street Journal, Platts, Metal Expert

Source: Company HP and media sources in the table.

Annex B. AVAILABLE EVIDENCE OF PLANT LEVEL CLOSURES

Table 5 summarises the plant-level closure information reported by public and commercial sources for the year 2019. Please note that this does not represent an exhaustive list of closures.

Table 5. Closure data

REGION	ECONOMIES	LOCATION	COMPANY	EQUIPMENT	CAPACITY (thousand metric tonnes)	SOURCES
Asia	China	Chengdu, Sichuan	Pangang Chengdu Vanadium	EAF	379	Company HP
Asia	China	Linyi, Shandong	Jiangxin Iron and Steel	BOF	2 700	Worldmetals.com
Asia	China	Xuzhou, Jiangsu	Saint-Gobain Pipe	BOF	1 200	Wood Mackenzie
Asia	China	Qinhuadao, Hebei	Qinhuangdao Shouqin Metal Material	BOF	3 450	Local government HP
Asia	China	Leshan, Sichuan	Southwest Stainless Steel	EAF	900	Wood Mackenzie
Asia	China	Qujing, Yunnan	Tiangao Nickel	BOF	1 100	Wood Mackenzie
NAFTA	United States	Ashland, Kentucky	AK Steel	BOF	2 500	Company HP
NAFTA	United States	LaPlace, Louisiana	Bayou Steel	EAF	620	Company HP, bloomberg
NAFTA	United States	Rancho Cucamonga, California	Commercial Metals Company (CMC)	EAF	500	Company HP
NAFTA	Canada	Hamilton, Ontario	Hamilton Specialty Bar	EAF	362	Metal Expert

Note: The data on nominal crude steelmaking capacity provided for China do not include the production capacity of “illegal” (“违法 Wéifǎ”) induction furnaces, nor do they reflect any changes in steelmaking capacity associated with those furnaces.

Source: Company HP, government HP and media sources in the table.

	Nominal crude steelmaking capacity					
	2009	2015	2016	2017	2018	2019
Asia	1318.6	1635.8	1622.2	1602.7	1574.4	1604.8
Non-OECD Asia	1122.3	1421.7	1408.6	1390.4	1362.7	1393.1
Bangladesh	2.5	4.6	4.6	4.6	5.1	6.8
Bhutan	0.0	0.0	0.0	0.0	0.0	0.0
Cambodia	0.0	0.0	0.0	0.0	0.0	0.0
China (People's Republic of)	978.5	1215.0	1192.9	1164.5	1128.0	1152.2
Chinese Taipei	22.6	29.4	29.4	29.4	29.4	29.4
Hong Kong, China	0.0	0.0	0.0	0.0	0.0	0.0
India	75.0	114.5	121.8	124.8	128.8	129.1
Indonesia	6.7	9.7	10.9	10.9	11.4	11.9
Japan	133.0	132.5	131.5	130.1	130.1	130.1
Korea	63.2	81.7	82.2	82.2	81.6	81.6
Democratic People's Republic of Korea	6.0	6.0	6.0	6.0	6.0	6.0
Lao PDR	0.0	0.0	0.0	0.0	0.0	0.0
Malaysia	9.4	10.7	10.7	10.7	14.2	14.2
Mongolia	0.1	0.1	0.1	0.1	0.1	0.1
Myanmar	0.1	0.3	0.3	0.3	0.3	0.3
Nepal	0.3	0.3	0.3	0.3	0.3	0.3
Pakistan	5.5	5.9	5.9	6.1	6.1	6.8
Philippines	1.6	1.8	1.8	1.8	1.8	1.8
Singapore	0.8	0.8	0.8	0.8	0.8	0.8
Sri Lanka	0.2	0.2	0.2	0.2	0.2	0.2
Thailand	7.7	9.9	9.9	9.9	9.9	9.9
Viet Nam	5.4	12.6	13.1	20.1	20.5	23.5
ASEAN-6	31.5	45.4	47.1	54.1	58.5	62.0
CIS	138.0	138.7	139.7	139.8	139.3	140.8
Armenia	0.0	0.2	0.2	0.2	0.2	0.2
Azerbaijan	0.5	1.6	1.6	1.6	1.6	1.6
Belarus	2.8	3.0	3.0	3.0	3.0	3.0
Georgia	0.0	0.2	0.2	0.2	0.1	0.1
Kazakhstan	7.0	7.7	7.7	7.7	7.7	7.7
Moldova	1.0	1.0	1.0	1.0	1.0	1.0
Russia	76.6	84.9	85.9	86.0	86.5	87.0
Turkmenistan	0.2	0.2	0.2	0.2	0.2	0.2
Ukraine	48.8	38.9	38.9	38.9	38.9	38.9
Uzbekistan	1.1	1.1	1.1	1.1	1.1	1.1

	Nominal crude steelmaking capacity					
	2009	2015	2016	2017	2018	2019
Europe	287.0	279.0	275.6	274.0	274.0	274.7
Non-OECD Europe	12.9	13.1	13.1	13.1	13.1	13.1
EU-28	240.8	223.0	219.6	216.4	216.4	216.4
Austria	8.0	8.5	8.5	8.5	8.5	8.5
Belgium	15.1	8.6	8.9	8.9	8.9	8.9
Bulgaria	1.2	1.2	1.2	1.2	1.2	1.2
Croatia	0.5	0.3	0.3	0.3	0.3	0.3
Cyprus	0.0	0.0	0.0	0.0	0.0	0.0
Czech Republic	7.8	6.8	6.8	6.8	6.8	6.8
Denmark	0.0	0.0	0.0	0.0	0.0	0.0
Estonia	0.0	0.0	0.0	0.0	0.0	0.0
Finland	5.1	4.5	4.5	4.5	4.5	4.5
France	22.3	19.6	19.6	19.1	19.1	19.1
Germany	51.4	51.9	51.9	51.9	51.9	51.9
Greece	3.7	3.7	3.7	3.7	3.7	3.7
Hungary	2.0	2.0	2.0	2.0	2.0	2.0
Ireland	0.0	0.0	0.0	0.0	0.0	0.0
Italy	38.4	37.9	37.0	34.3	34.3	34.3
Latvia	0.8	0.9	0.9	0.9	0.9	0.9
Lithuania	0.0	0.0	0.0	0.0	0.0	0.0
Luxembourg	3.7	2.4	2.4	2.4	2.4	2.4
Malta	0.0	0.0	0.0	0.0	0.0	0.0
Netherlands	7.8	7.8	7.8	7.8	7.8	7.8
Poland	12.0	12.0	12.0	12.0	12.0	12.0
Portugal	1.7	1.7	1.7	1.7	1.7	1.7
Romania	5.6	5.2	5.2	5.2	5.2	5.2
Slovak Republic	5.5	4.9	4.9	4.9	4.9	4.9
Slovenia	0.7	0.7	0.7	0.7	0.7	0.7
Spain	23.1	22.5	21.7	21.7	21.7	21.7
Sweden	6.0	6.0	6.0	6.0	6.0	6.0
United Kingdom	18.7	14.1	12.1	12.1	12.1	12.1
Other Europe	46.2	56.0	56.0	57.5	57.5	58.2
Albania	0.7	0.9	0.9	0.9	0.9	0.9
Bosnia and Herzegovina	2.0	2.0	2.0	2.0	2.0	2.0
Iceland	0.0	0.0	0.0	0.0	0.0	0.0
Montenegro	0.4	0.4	0.4	0.4	0.4	0.4
North Macedonia	0.5	0.5	0.5	0.5	0.5	0.5
Norway	0.8	0.8	0.8	0.8	0.8	0.8
Serbia	2.2	2.7	2.7	2.7	2.7	2.7
Switzerland	1.4	1.4	1.4	1.4	1.4	1.4
Turkey	38.3	47.4	47.4	48.9	48.9	49.6

	Nominal crude steelmaking capacity					
	2009	2015	2016	2017	2018	2019
Latin America	62.6	70.6	73.6	74.3	74.2	74.2
South America	59.9	67.8	70.8	71.5	71.4	71.4
Non OECD Latin America	60.7	68.7	71.7	72.3	72.3	72.3
Argentina	6.7	6.7	6.7	7.3	7.3	7.3
Brazil	41.2	48.3	51.3	51.3	50.7	50.7
Bolivia	0.0	0.0	0.0	0.0	0.0	0.0
Chile	2.0	2.0	2.0	2.0	2.0	2.0
Colombia	2.0	2.0	2.0	2.0	2.0	2.0
Costa Rica	0.0	0.0	0.0	0.0	0.0	0.0
Cuba	0.7	0.7	0.7	0.7	0.7	0.7
Dominican Republic	0.4	0.4	0.4	0.4	0.4	0.4
Ecuador	0.6	0.9	0.9	0.9	1.3	1.3
El Salvador	0.2	0.3	0.3	0.3	0.3	0.3
Guatemala	0.5	0.5	0.5	0.5	0.5	0.5
Panama	0.0	0.0	0.0	0.0	0.0	0.0
Paraguay	0.1	0.1	0.1	0.1	0.3	0.3
Peru	1.6	2.0	2.0	2.0	2.0	2.0
Puerto Rico	0.1	0.1	0.1	0.1	0.1	0.1
Trinidad and Tobago	1.0	1.0	1.0	1.0	1.0	1.0
Uruguay	0.1	0.1	0.1	0.1	0.1	0.1
Venezuela	5.6	5.7	5.7	5.7	5.7	5.7

Middle East	30.7	56.7	57.1	59.8	62.3	65.1
Non OECD Middle East	30.2	56.2	56.6	59.2	61.7	64.5
Afghanistan	0.0	0.0	0.0	0.0	0.0	0.0
Bahrain	0.2	0.2	0.2	0.2	0.2	0.2
Iran	16.0	28.2	28.2	30.7	33.2	36.0
Iraq	0.2	2.6	2.6	2.6	2.6	2.6
Israel	0.6	0.6	0.6	0.6	0.6	0.6
Jordan	0.6	1.2	1.2	1.2	1.2	1.2
Kuwait	0.2	1.4	1.4	1.4	1.4	1.4
Lebanon	0.2	0.2	0.2	0.2	0.2	0.2
Oman	0.4	3.0	3.0	3.0	3.0	3.0
Qatar	2.8	3.2	3.2	3.2	3.2	3.2
Saudi Arabia	7.0	9.6	9.6	9.6	9.6	9.6
Syrian Arab Republic	0.1	2.4	2.4	2.6	2.6	2.6
United Arab Emirates	2.4	4.0	4.4	4.4	4.4	4.4
Yemen	0.1	0.3	0.3	0.3	0.3	0.3

	Nominal crude steelmaking capacity					
	2009	2015	2016	2017	2018	2019
NAFTA	156.3	154.1	155.5	155.9	156.5	152.6
Canada	17.7	15.6	15.6	15.6	15.6	15.3
Mexico	20.3	26.7	27.1	27.1	27.7	27.7
United States	118.3	111.8	112.8	113.2	113.2	109.7
Oceania	9.1	6.4	6.4	6.4	6.4	6.4
Australia	8.1	5.4	5.4	5.4	5.4	5.4
New Zealand	1.0	1.0	1.0	1.0	1.0	1.0
OECD TOTAL	645.4	649.7	647.3	644.6	644.6	641.4
Non-OECD TOTAL	1388.3	1727.2	1721.0	1707.0	1683.9	1721.1
WORLD TOTAL	2033.8	2376.9	2368.3	2351.6	2328.4	2362.5

Note on China:

The data on nominal crude steelmaking capacity provided for China do not include production capacity by "illegal" ("违法 Wéifǎ") induction furnaces, nor do they reflect any changes in steelmaking capacity associated with those furnaces.

Note on ASEAN-6:

ASEAN-6 denotes the aggregate of member economies of SEAISI (The South East Asia Iron and Steel Institute) in the ASEAN region, i.e. Indonesia, Malaysia, Philippines, Singapore, Thailand and Viet Nam.

Note by Turkey:

The information in this document with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognizes the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of United Nations, Turkey shall preserve its position concerning the "Cyprus" issue.

Note by all the European Union Member States of the OECD and the European Union:

The Republic of Cyprus is recognized by all members of the United Nations with the exception of Turkey. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.

Note on Israel:

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

Source: OECD.

Annex D. DATA FOR GLOBAL CRUDE STEELMAKING CAPACITY AND CRUDE STEEL PRODUCTION

Table 7. Global crude steelmaking capacity and crude steel production (data from 2000)

mmt	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Steelmaking Capacity	1 132	1 166	1 286	1 430	1 503	1 606	1 697	1 817	1 913	2 034	2 155	2 226	2 281	2 362	2 386	2 377	2 368	2 352	2 328	2 362
Crude Steel Production	850	852	905	971	1 063	1 148	1 250	1 348	1 343	1 239	1 433	1 538	1 560	1 650	1 669	1 620	1 627	1 730	1 808	1848.5
Capacity-Production Gap	282	314	381	459	440	458	447	469	570	795	721	688	721	712	717	757	741	622	520.0	513.9
Crude steel production as a % of capacity	75.1%	73.1%	70.4%	67.9%	70.7%	71.5%	73.7%	74.2%	70.2%	60.9%	66.5%	69.1%	68.4%	69.9%	70.0%	68.2%	68.7%	73.6%	77.7%	78.2%

Note: Capacity data reflect information up to December 2019. Annual production data for 2019 are based on the press release of 27 January 2020 by the World Steel Association (World Steel Association, 2020). Annual production data from 2000 to 2018 are from “Steel Statistical Yearbook 2019”, published by the World Steel Association. Annex D for a table with data on global crude steelmaking capacity and production from 2000 to 2019 (World Steel Association, 2019).

Source: OECD for capacity and World Steel Association for production.

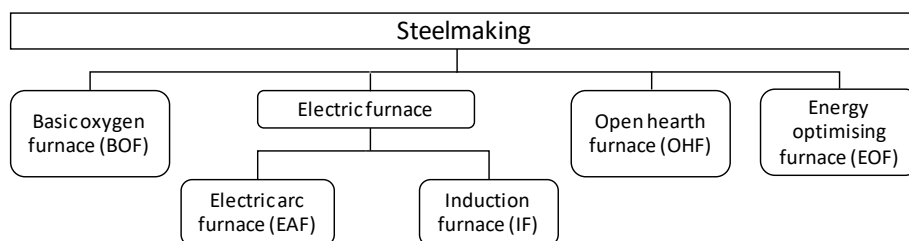
Annex E. GLOBAL STEELMAKING CAPACITY OF INDUCTION FURNACES (IF)

What is an IF?

An induction furnace (IF) is one type of electric furnace used to produce steel (Figure 5). Compared to the Electric Arc Furnace (EAF), the IF technology has several disadvantages but also some advantages. For example, an EAF is flexible in the sense that it can be turned on and off with relative ease (in order to respond to changes in market conditions). EAFs can also produce a wide variety of steel products, and are subject to a number of quality controls. The annual production capacity of an EAF usually starts from 200 000 metric tonnes. An IF is smaller, usually with an annual production capacity of 50 000 to 100 000 metric tonnes (Metal Expert, 2018^[73]). While EAFs might generate greater economies of scale, IFs have lower installation costs.

Moreover, an IF does not need to use oxygen, fuel, slag builders and graphite electrodes, all of which have been in high demand recently, while these are important inputs for the EAF process (Harald, Koblenzer; Bojan, 2017^[74]). Nevertheless, the lifetime of IF equipment tends to be shorter and steel production using IF technology is more energy intensive and entails higher associated environmental costs.¹² In the short term, both the investment and operational costs associated with IF steelmaking are lower than that of an EAF, which provides some incentives for the adoption and use of this type of technology.

Figure 5. Classification of major steelmaking processes



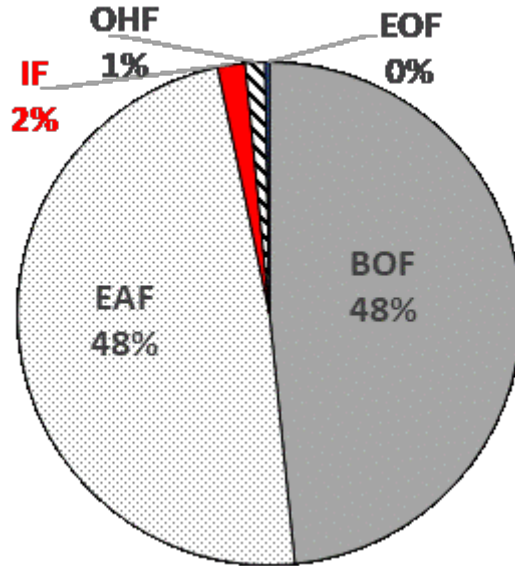
Source: “World Steel Capacities Database” on 30 January 2020

Global IF capacities

The global number of IF plants has been growing recently, possibly a result of the lower installation and operational costs as noted above. Although the share of global IF steelmaking capacity is currently only around 2% of total capacity, IF capacity has been increasing rapidly for more than a decade. For example, global IF capacity increased by 104% from 2009 to 2019, reaching a level of over 18 mmt in 2019 (Figure 6.C).

Figure 6. Global expansion of steelmaking IF capacity (excluding China)

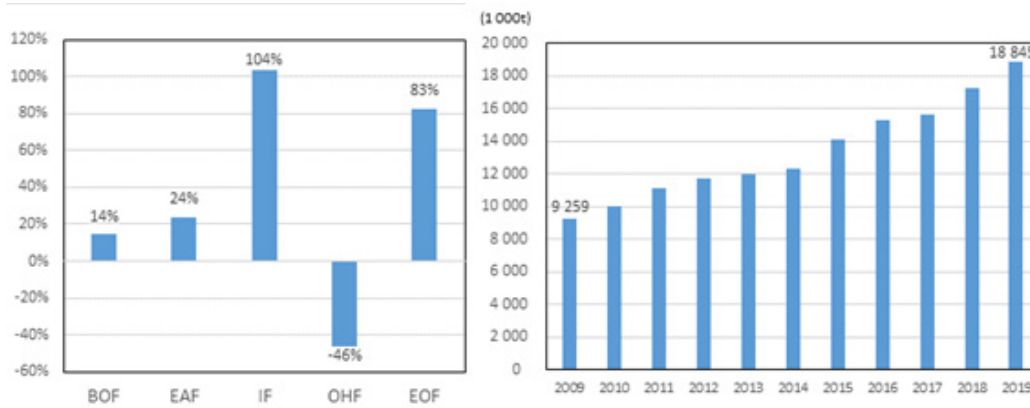
A. Global steelmaking capacity by process (as of December 2019)



B. Global capacity % change by process: 2009- 2019

C. Level of global IF production capacity: 2009-19

Note: Data are up to December 2019. These graphs do not include Chinese data because these are neither available from the *World Steel Capacities Database* (the main source of information used) nor from other databases to which the Secretariat has access. Delegates are invited to share any available information on this issue with the Secretariat. Energy Optimising Furnaces (EOF) have been identified in only five plants around the world, with a total steelmaking capacity of around 2.9 mmt as of December



2019.

Source: OECD calculations based on World Steel Capacities Database (Metal Expert, 2020^[59])

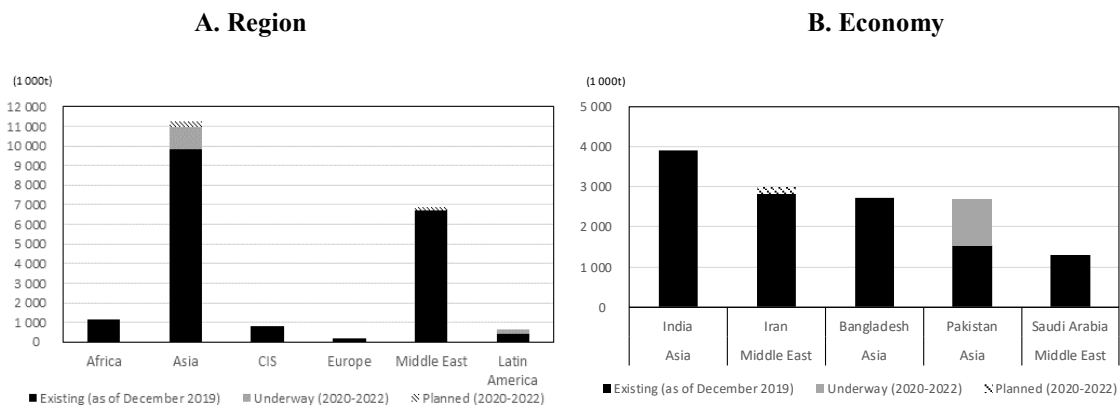
Regional developments in IF capacities

Looking at regional developments, Asia has the largest share of IF steelmaking capacity currently, accounting for 9.8 mmt. India has around four mmt in IF capacity, while Iran and Bangladesh have 2.8 mmt and 2.7 mmt, respectively. It is important to note that the data on IF capacity used in this analysis, which are sourced from Metal Expert (Metal Expert, 2020_[59]), are well below figures from other sources and that there can be significant discrepancies in IF capacity data.¹³

According to Metal Expert (Metal Expert, 2020_[59]), there are several IF investment projects taking place in Asia, and IF steelmaking capacity could increase there by 1.1 mmt to 11 mmt by 2022 (including projects that are either underway or planned). In the Middle East IF capacity is around 6.7 mmt, and Iran and Saudi Arabia have 2.8 mmt and 1.3 mmt of IF capacity, respectively. IF capacity in this region could increase by 0.15 mmt to 6.9 mmt by 2022 (including projects that are either underway or planned).

Among other regions, Africa has 1.1 mmt of IF capacity, while the CIS and Europe have 0.8 mmt and 0.2 mmt of IF capacity, respectively. Latin America currently has 0.4 mmt of IF capacity, and 0.2 mmt of additional IF capacity is underway and expected to be operational by 2022 (Figure 7).

Figure 7. IF steelmaking capacity by region and economy (except China and ASEAN*)



Note: *As of December 2019. These graphs do not include data for Chinese nor the majority of ASEAN economies because these are neither available from “World Steel Capacities Database” nor from other databases to which the Secretariat has access. Delegates are invited to share any available information on this issue with the Secretariat. The economies listed in Figure 5.B are the major IF producers by capacity volume exceeding one million metric tonnes.

Sources: OECD calculation based on World Steel Capacities Database (Metal Expert, 2020_[59]).

Box 3. IFs in ASEAN

The number of IFs have been growing in the Association of South East Asian Nations (ASEAN) region. There are many small enterprises producing steel based on the IF technology in this region, and official statistics on IF capacity are not available in many cases. However, it is estimated that more than 8 mmt of IF steelmaking capacity is currently in place in the ASEAN region (Table 8). The difference from the previous paper can be attributed to the operation of a new IF in Vietnam in the second half of 2019.

Table 8. Unofficial estimates of steelmaking IF capacities in ASEAN

Economy	IF capacity (mmt)
Indonesia	Over 3
Malaysia	0.53
Philippines	0.4-0.5
Thailand	2.8
Viet Nam	1.63
Total	8.4-8.5

Note: Capacity figures for Indonesia, Malaysia, the Philippines and Thailand are sourced from comments by steel industry experts in these economies. The World Steel Capacities Database released by Metal Expert does not report any IF capacities for these economies. Therefore, these unofficial IF capacities based on anecdotal evidence are not included in the OECD Steelmaking Capacity database (Annex C) because detailed information, such as company names, plant location and commissioning year, is not available. The capacity figure for Viet Nam is based on the World Steel Capacities Database.

Sources: Metal Expert (Metal Expert, 2018^[73]), Reuters (Reuters, 2019^[75]) and the World Steel Capacities Database (Metal Expert, 2020^[59]).

The possible transfer of induction furnaces overseas

An issue of interest in recent discussions on capacity developments has been the possibility of IF equipment transfers overseas following facility closures in domestic markets. Indeed, in the current context of excess capacity, closures of inefficient production facilities in one economy should not be offset by the installation of that same equipment in other economies, if the goal is move towards net reductions of capacity.

Recent media reports have suggested that equipment from closed IF steelmaking plants have been exported to some ASEAN economies, particularly Indonesia and the Philippines (Reuters, 2019^[75]). This is raising safety and quality concerns in those economies. In January 2018, the ASEAN Iron and Steel Council (AISC), one of the steel bodies in the ASEAN region, called on the ASEAN governments to prohibit the imports of “obsolete” IFs from China for use in steelmaking production (SEAISI, 2018^[76]). More recently, the Department of Trade and Industry (DTI) in the Philippines noted that they will review existing standards and production methods used in steelmaking, especially induction furnaces, because it can produce inconsistent quality and non-conforming steel products in September 2019 (Platts, 2019^[77]).

To examine this issue, the Secretariat collected and examined trade data by product from the UN Comtrade Database on the volume of exports of furnaces from China and rest of

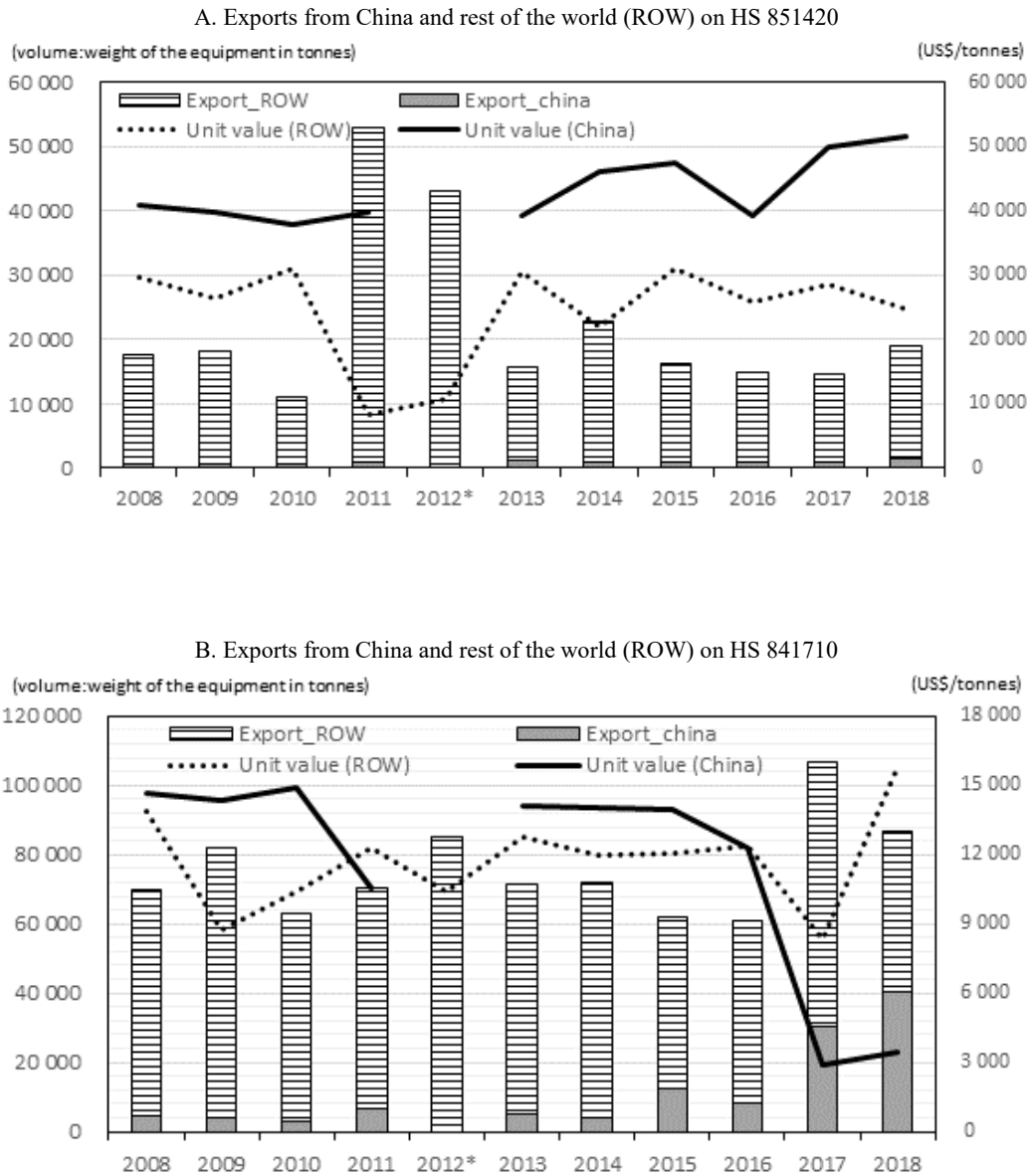
the world (ROW) classified by the HS codes 851420 (Furnaces and ovens; electric, for industrial or laboratory use, functioning by induction or dielectric loss) and HS 841710 (for the melting or other heat-treatment of ores, non-electric), which are assumed to capture induction furnaces for the production of steel. In addition, trade data from July 2018 to December 2018 is added from the previous paper.

The data at hand show that the Chinese exports of the former remained relatively stable at around one thousand tonnes until 2017 and increased slightly to around 1,300 tonnes in 2018. The unit value (USD per tonne) of this export category increased for two consecutive years (Figure 8.A). Exports from the ROW also remained stable, but increased somewhat in 2018. The ROW unit value was lower relative to the unit value of Chinese exports for this HS category. It is natural for unit values to diverge, because countries can export very different products within a given HS classification, including the furnaces and ovens covered by this category.

The data on Chinese exports of furnaces classified as HS 841710 show that their export volume has increased rapidly, from less than 10 thousand tonnes in 2016 to over 30 thousand tonnes in 2017, and more over 40 thousand tonnes in 2018. On other hand, export volumes from the ROW increased significantly in 2017, but dropped in 2018. The Chinese unit value (of exports of the HS 841710 category) declined sharply, from a level of USD 10 000-14 000 per tonne in the several years prior to USD 4 000 per tonne in 2018, while the unit value of exports from the ROW has basically kept over USD 12 000 per tonne except in 2017 for some years (Figure 8.B).

While these data indicate some interesting trends, further work would be needed to clarify issues related to IF equipment exports and their impacts on capacity. In particular, it is necessary to confirm where the specific induction furnaces of interest fall within the HS classification system. To that end, it would be useful to discuss the issue with the relevant equipment suppliers, and to verify the precise HS categories that are relevant for different kinds of induction furnaces. Due to time constraints, this was not feasible at this stage, but can be considered for later analyses on steelmaking capacity.

Figure 8. Export of furnaces



Note: * For Chinese data, there is no volume data (net weight) for 2012, according to UN Comtrade Database on 25 January 2020. The description of HS 841710 is “Furnaces and ovens; non-electric, for the roasting, melting or other heat-treatment of ores, pyrites or of metals, for industrial or laboratory use”, and HS 851420 is “Furnaces and ovens; electric, for industrial or laboratory use, functioning by induction or dielectric loss”.

Source: OECD calculation based on UN Comtrade Database.

Annex F. WORKING DEFINITION USED

Steelmaking capacity

The OECD Secretariat employs a definition of nominal crude steelmaking capacity based on maximum theoretical equipment capacity.¹⁴ This definition does not take into account yield losses, maintenance and other factors affecting the productivity of installed steelmaking equipment. Therefore, steelmaking capacity figures provided by the OECD should not be regarded as effective capacity.

Capacity is defined in volume (tonnes) and annual capacity data figures reflect all existing steelmaking capacity at the end of a calendar year.

Steelmaking equipment

The OECD Secretariat considers as steelmaking equipment any equipment used to produce crude steel. The definition excludes iron-making equipment considered here as upstream, as well as casting, rolling or finishing equipment considered here as downstream. More specifically, the following equipment types are considered as crude steelmaking:

Type	Code
Electric arc furnace	EAF
Energy Optimising Furnace	EOF
Induction furnace	IF
LD Basic Oxygen furnace	BOF
Open hearth furnace	OHF
Steelmaking - not specified	STEELMKG

Assessing capacity developments

Information from the three databases described in Annexes A-C (existing capacity, new investments and closures) in this paper are used to assess capacity developments¹⁵. More specifically, changes in capacity are derived by taking into account new capacity additions and permanent closures in a given economy. In order to assess potential gross capacity additions in the future, investment projects are classified as “underway” or “planned”. A project classified as “underway” is one which is under construction or for which contracts for equipment have been awarded and a major financial or state commitment has been made. “Planned” projects are more uncertain because they are either at the feasibility or early planning stage, yet to receive financial or state backing, or not scheduled for completion at a specified time. The classification of projects and comments on their progress do not in any way represent a judgement or imply a view on the advisability or feasibility of the projects.

Because closures cannot be forecasted, the tables in this document provide only potential gross capacity additions and do not provide projections of net changes in capacity. It should be noted that planned or underway investments are sometimes altered due to changes in market conditions. Postponements refer to projects that were put on hold for a definite or

indefinite period, while cancellations are previously announced projects that will no longer be implemented.

Steelmaking capacity closures

The OECD Secretariat distinguishes between "permanent" and "temporary" steelmaking capacity closures. Permanent closures of capacity are considered to involve dismantling and scrapping of the equipment used for producing crude steel, or otherwise rendering such equipment permanently unusable for manufacturing crude steel. Temporary closures entail measures other than permanent closures as defined above, whereby production can be resumed in the future. Temporary closures include, for example, the idling of a plant's furnace. Only permanent closures are used for the purpose of calculating existing capacity. In practice, when compiling the database, it is unfortunately not always possible to understand from media sources if a closure is only temporary or permanent. This explains why the field value of "Type of closures" is sometimes set to "Others (unidentified)" in the OECD database on closures.

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Endnotes

¹ Given the timing of the data used for tables containing regional indicators, the United Kingdom is included under aggregates calculated for the European Union. In future reports, the United Kingdom will not be included under the EU aggregate.

² The previous figure of 2 290.1 mmt for 2019 was based on information available up to June 2019. The new figure of 2 362.5 mmt for 2019 described in this report reflects new information available up to December 2019 and reflects the revision data of some countries from the aggregate economy level to the plant and firm level as noted above.

³ Revisions of the 2019 figures due to the change in methodology consist of include the following: China +95.9 mmt, the United States -3.2 mmt, Mexico +1.5 mmt, Japan +2.0 mmt, and Korea -6.3 mmt.

⁴ Hebei province is reported to have closed steelmaking capacity amounting to around 12.30 mmt in 2018, i.e. 2.5% more than the closure target (Hebei Metallurgical Industry Association, 2019_[10]).

⁵ Automotive and home appliance industries have been developing mainly in Eastern China (including Shanghai city, Jiangsu, Zhejiang, Anhui, Fujian, Jiangxi and Shandong provinces) and South Central China (including Henan, Hubei, Hunan, Guangdong, Guangxi and Hainan provinces). The automotive production of these two areas represented around 60% of total Chinese production in 2017. The share of production of refrigerators, air conditioners and washing machines was roughly 90% in 2017 (National Bureau of Statistics of China, 2018).

⁶ Because the Secretariat has not been able to confirm the start of operations at these plants, they are not reflected in the aggregate capacity figures for China at this time. Future revisions may be made as further information about the status of these projects becomes available.

⁷ ArcelorMittal's 2018 annual report states: "The Company explored investment opportunities in India and in June 2010, entered into a memorandum of understanding with authorities in the state of Karnataka in South India that envisaged the construction of a 6.0 mmt steel plant with a power plant, representing a potential aggregate investment of \$6.5 billion. The company has completed all the necessary formalities for acquiring the land by signing and executing a lease cum sale agreement for 1,070 ha (2643.25 acres) of land on 26 December 2018 and the project is currently under review" (ArcelorMittal, 2019).

⁸ ASEAN-6 denotes the aggregate of member economies of SEAISI (The South East Asia Iron and Steel Institute) in the ASEAN region, i.e. Indonesia, Malaysia, Philippines, Singapore, Thailand and Viet Nam.

⁹ For the following projects, no further details about the construction schedule and steelmaking technology have yet been disclosed: HBIS in the Philippines, Shaanxi in Indonesia, Hebei Xinwuan and MCC in Malaysia, and Kunming in Myanmar.

¹⁰ These projects are planned by Formosa Ha Tinh Steel Corporation (FHS) in Viet Nam, with the following investors: Formosa Plastic Group, China Steel Corporation (both Chinese Taipei companies) and JFE Steel Corporation (Japanese company) (FHS, 2020_[78]). FHS plans to expand steelmaking capacity to 10 mmt, and eventually expand to a capacity level of more than 20 mmt (steelplantech, 2019_[79]).

¹¹ PT Krakatau POSCO (the investors are Krakatau Steel, an Indonesian company, and POSCO, a Korean company) has plans to expand steelmaking capacity by 3.0 mmt in the near future (Krakatau POSCO, 2017_[80]).

¹² An IF needs higher electrical energy consumption in process of production compared with an EAF, and it needs a housing equipment for dust and fume collection, while an EAF is equipped with quenching tower, cyclone and dust filter together. Moreover, life time of IF' refractory is shorter than EAF's (Harald, Koblenzer; Bojan, 2017^[74]).

¹³ For example, the Global Forum on Steel Excess Capacity Report ((n.a.), 2017^[81]) notes that IF capacity for India amounted to 30% of its total installed capacity in 2016, implying nearly 38 mmt of IF capacity. Other sources, such as PlantFacts (WORLD STEEL DYNAMICS, 2019^[82]), report IF capacity that corresponds to highly technologically advanced production processes and not to IF facilities that produce low-value steel products. The significant discrepancies found in IF capacity data across different data sources, most likely due to difficulties in identifying individual IF furnaces around the world, particularly the very small ones and those that produce low-value steel products, should be taken into account when assessing the analysis contained in this Annex.

¹⁴ This definition is also commonly referred to as nominal, rated or nameplate capacity.

¹⁵ The list of data sources is available at <http://www.oecd.org/sti/ind/steelcapacity-methodology.htm>

Latest Developments in Steelmaking Capacity provides up-to-date information on crude steelmaking capacity developments at the global, regional and country levels. Reviewed and approved by the OECD Steel Committee, these annual reports provide detailed descriptions of key investment projects to build new steel plants or to expand steelmaking production capacity at existing plants, allowing policymakers, industry, media and academia to keep abreast of developments in steelmaking capacity around the world.

This report provides annual estimates of aggregate capacity for steel-producing economies through 2019, based on available information on new investments and closures of capacity. It also looks ahead to investment projects expected to come on stream over the next few years, giving readers an indication of how capacity might evolve in the short to medium term across different regions and countries. Topical issues are covered, as well, including developments in cross-border steelmaking capacity investments. The underlying annual nominal crude steelmaking capacity data by economy reflected in this report are publicly available at <http://stats.oecd.org/>.

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