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Latest developments in steelmaking capacity

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The OECD Steel Committee delegates discussed a draft of the report at the Steel Committee meeting on 25-26 March 2019 and have approved it for declassification following comments from delegates which are reflected in this document. The report and the underlying data on steelmaking capacity for all steel producing economies will be made available on the Steel Committee website: oe.cd/steelcapacity

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 2021, as well as information on cross-border capacity investments. The latest available data suggest that global steelmaking capacity (in nominal crude terms) declined marginally in 2018. While investment and closure data from the first half of 2018 had suggested the possibility of a slight increase in global steelmaking capacity for the year as a whole, incoming information on closures as well as recent reports indicating that some investment projects were postponed have led to a slight downward adjustment in the estimate for year-2018 global steelmaking capacity. However, many investment projects continue to take place around the world and others are in the planning stages. Should these projects be realised, global steelmaking capacity could increase by approximately 4-5% between 2019 and 2021 in the absence of closures, amounting to additional capacity ranging from 88 to 110 million tonnes during this period. Asia is expected to experience a considerable increase in steelmaking capacity over the next few years, while many capacity additions are also planned in the Middle East region. The information on announced investment projects also suggests that steel-making capacity in the other regions could also increase somewhat in the coming years.

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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.[1] The Secretariat monitors capacity developments on an ongoing basis and updates capacity numbers with 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 of 2019-21, based on information available until December 2018. 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) declined marginally in 2018. While investment and closure data from the first half of 2018 had suggested the possibility of a slight increase in global steelmaking capacity for the year as a whole, incoming information on closures as well as recent reports indicating that some investment projects were postponed have led to a slight downward adjustment in the estimate for year-2018 global steelmaking capacity. However, 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 4-5% between 2019 and 2021 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.

Box 1. OECD Steelmaking Capacity database

The OECD Steelmaking Capacity database contains data on crude steelmaking capacity by economy and provides researchers and policymakers with an important tool for analysing steel capacity developments. The database will be updated in late spring of 2019 to reflect newer information provided in this paper, and the data will extend until December 2018.

The OECD Secretariat compiles steelmaking capacity data using a wide range of publicly available and commercial data sources. These data sources include government sources, commercial capacity databases, specialised media reports, and company information. The data are reviewed periodically by the OECD Steel Committee. Capacity figures are in terms of nominal crude steelmaking capacity. The data refer to maximum theoretical equipment capacity. This definition does not take into account yield losses, maintenance and other factors affecting the productivity of installed steelmaking equipment. Therefore, the steelmaking capacity figures provided should neither be regarded as effective capacity nor as production. The annual capacity figures reflect all existing steelmaking capacity at the end of a calendar year.

The OECD Steelmaking Capacity database as well as recent reports on steelmaking capacity developments are available on the OECD Steelmaking Capacity portal at oe.cd/steelcapacity.

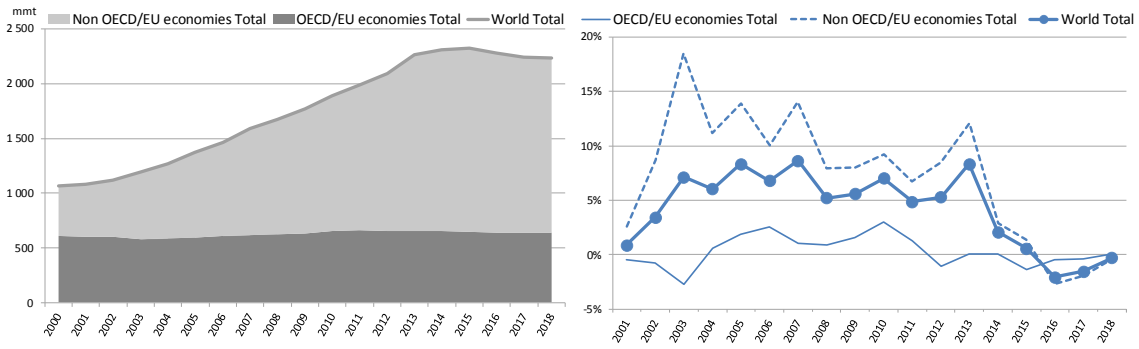
2. The latest developments in global steelmaking capacity

2.1. Global summary

The latest available information (as of 31 December 2018) suggests that global steelmaking capacity (in nominal crude terms) remained nearly unchanged in 2018, following declines in 2016 and 2017 (Figure 1.A). The OECD has revised (slightly downwards) its 2017 figures for global steelmaking capacity to 2 240.1 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] The net capacity change in 2018, taking into account new capacity additions and closures, brings current global steelmaking capacity to 2 233.7 mmt, representing a slight decline of slightly more than 6 mmt, i.e. 0.3%, from the level of 2017. The decline in global steelmaking capacity in 2018 follows a deceleration in capacity growth since 2013 and results from both capacity reductions and slower capacity growth in some parts of the world (Figure 1. B).

Figure 1. Evolution of crude steelmaking capacity in OECD/EU economies and non OECD/EU economies

A. Level (mmt) B. Annual % change



Note: Capacity data reflect information available to December 2018.
Source: OECD

2.2. Regional capacity developments

2.2.1. Latest developments

Table 1 provides OECD data on existing nominal crude steelmaking capacity in 2017 and 2018, taking into account new information on capacity additions and closures available up to December 2018. Most of the recent capacity additions took place in the Middle East and Africa regions, where an additional 2.9 mmt of capacity (+4.6%) and 2.6 mmt (+6.5%) were deployed in 2018, respectively. Steelmaking capacity in the North American Free Trade Agreement (NAFTA) region also increased slightly in 2018, doing so by 0.6 mmt (+0.4%). On the other hand, the latest capacity developments suggest that a 11.9 mmt net reduction (-0.8 %) took place in Asia, and a 0.5 mmt net reduction (-0.3%) occurred in the Commonwealth of Independent States (CIS) region. Steelmaking capacity in Latin America remained stable at around 74.7 mmt in 2018, reflecting the offsetting effects of

the closure of 0.6 mmt of steelmaking capacity and simultaneous increase of 0.55 mmt of capacity that came on stream last year. In the Europe and Oceania regions, neither new investments nor permanent closures were observed during 2018 from the sources used to update the OECD's capacity monitoring databases.

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

	Existing nominal capacity (mmt)		% change	Potential gross capacity additions in 2019-21 (mmt)		Potential capacity level in 2021 based on gross capacity additions (mmt)		% change expected (2018 vs 2021)	
	2017	2018 (A)	2018-2017	Underway (B)	Planned (C)	Low (A)+(B)	High (A)+(B)+(C)	Low	High
Africa	39.0	41.6	6.5%	2.9	1.8	44.4	46.2	6.9%	11.2%
Asia	1 484.9	1 473.0	-0.8%	53.4	10.0	1 526.4	1 536.4	3.6%	4.3%
CIS	142.9	142.4	-0.3%	1.8	1.0	144.2	145.2	1.3%	2.0%
Europe	274.0	274.0	0.0%	4.1	1.0	278.1	279.1	1.5%	1.9%
Latin America	74.7	74.7	-0.1%	0.2	1.4	74.9	76.3	0.3%	2.1%
Middle East	64.4	67.3	4.6%	25.1	2.7	92.4	95.1	37.3%	41.3%
NAFTA	153.8	154.4	0.4%	0.3	4.5	154.7	159.3	0.2%	3.1%
Oceania	6.4	6.4	0.0%	0.0	0.0	6.4	6.4	0.0%	0.0%
OECD/EU Economies Total	639.7	640.3	0.1%	4.4	5.5	644.7	650.3	0.7%	1.6%
Non OECD/EU Economies Total	1 600.3	1 593.4	-0.4%	83.4	16.9	1 676.8	1 693.6	5.2%	6.3%
World Total	2 240.1	2 233.7	-0.3%	87.8	22.4	2 321.5	2 343.9	3.9%	4.9%

Note: Capacity data reflects all information on changes up to December 2018. 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 2019-2021

Information on announced investment projects suggests that, globally, 87.8 mmt of gross capacity additions are currently underway and could come on stream during the three-year period of 2019-21. An additional 22.4 mmt of capacity additions are currently in the planning stages for possible start-up during the same time period (Table 1).

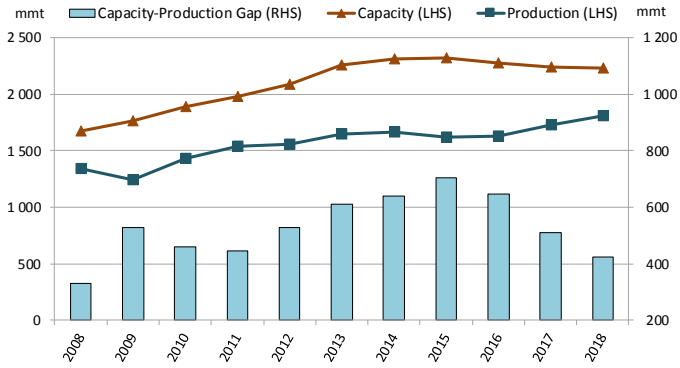
Asia could experience a considerable increase in steelmaking capacity over the next few years, with over 53.4 mmt of gross capacity additions currently underway and 10 mmt in the planning stages for the period 2019-21. Several capacity investments are also taking place in the Middle East region, where investment projects amounting to 25.1 mmt of capacity are currently underway, and due for completion in the next three years. Some investments are also underway in Africa and Europe, amounting to a total of 2.9 mmt and 4.1 mmt of capacity that could come on stream during the period of 2019-21, respectively. The CIS, Latin America and NAFTA regions could also see an increase in capacity, with 1.8 mmt, 0.2 mmt and 0.3 mmt of gross additions currently underway in each region, respectively. No capacity additions are currently underway in Oceania.

2.3. The gap between global capacity and production

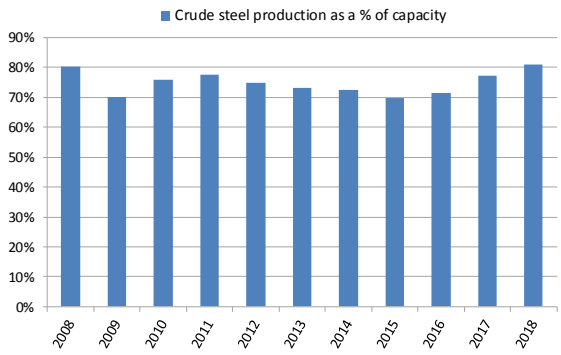
The gap between global capacity and production is likely to have narrowed in 2018 in view of the slight reduction in global crude steelmaking capacity (-0.3%), while global steel production increased strongly (global crude steel production increased by 4.6% in 2018). In view of these developments, the gap between capacity and production is expected to have declined to 425.1 mmt in 2018 (Figure 2. A). As a result, global production of steel as a per cent of capacity may have increased from 77.2% in 2017 to 81.0% in 2018 (Figure 2.B).

Figure 2. Global crude steelmaking capacity and crude steel production

A. Capacity-Production gap (mmt)



B. Crude steel production as a % of capacity



Note: Capacity data reflect information up to December 2018. Annual production data for 2017 and 2018 are based on the press release of 25 January 2019 by the World Steel Association (World Steel Association, 2019[1]).Annual production data from 2008 to 2016 are from "Steel Statistical Yearbook 2018", published by the World Steel Association (World Steel Association, 2018[2]). Please see Annex D for a table with data on global crude steelmaking capacity and production from 2000 to 2018.
Source: OECD for capacity and World Steel Association for production.

3. A review of regional capacity developments

3.1. Africa

In Africa, there are some investment projects that are planned or already underway, aimed at increasing domestically produced steel for use in the development of the region's infrastructure. Overall, the region's steelmaking capacity could grow from a level of 39.0 mmt in 2017 to 44.4 mmt by 2021 (+13.8%). North African economies have attracted cross-border investments and there are several projects supported by neighbouring economies. For example, Turkey's Tosyali Holding started the operation of new Electric Arc Furnace (EAF) facilities in Algeria in May 2018, with the capacity to produce 2.3 mmt of steel (Metal Expert, 2018[3]) (Platts, 2018[4]). Algerian Qatari Steel (AQS), which is a joint venture company between Algeria's IMETAL and Qatar's Qatar Steel, has started to build a new EAF plant in Algeria with a capacity of 2.0 mmt— operations are scheduled to begin in 2019 (Algerian Qatari Steel, 2019[5]) (Danieli, 2015[6]).[3]

Amongst other projects, Nigeria's Standard Metallurgical Company commissioned a new EAF plant near Lagos in August 2018, with the annual capacity to produce 0.25 mmt of crude steel (Standard Metallurgical Company, 2018[7]).[4] Egypt's Ezz Rolling Mills (ERM) is constructing a new EAF with a capacity of 0.85 mmt, scheduled to begin operations in 2019 (Metal Expert, 2018[8]). Algeria's ETRHB has plans to install a new 0.8 mmt EAF in Berrahal, with operations scheduled to start in 2020 (Danieli, 2018[9]) (Metal Expert, 2018[10]). In addition, Namibia's Groot Group plans to construct the country's first steelmaking plant with a capacity of 1.0 mm in the Ohangwena region, which is planned to be completed in 2020 (Groot Group, 2018[11]).

3.2. Asia and Oceania

Steelmaking capacity in Asia decreased in 2018 for the third consecutive year, falling from 1 484.9 mmt in 2017 to 1 473.0 mmt in 2018 (-0.8%). However, in the absence of additional closures, steelmaking capacity in the region could increase to 1 526.4 mmt between 2019 and 2021 (+3.6%), based on potential gross capacity additions. In Oceania, there are no new investments underway, nor were permanent closures observed during 2018 from the publicly available sources used to update the OECD's monitoring databases.

Steelmaking capacity in the People's Republic of China (hereafter "China") has declined in recent years, falling by around 120 mmt between 2016 and 2017, according to the National Development and Reform Commission (NDRC, 2018[12]). A target was set for reducing steelmaking capacity by an additional 30 mmt in 2018 as part of the 100-150 mmt closure target set for the period until 2020 by authorities including the National Development and Reform Commission (NDRC, 2018[12]). In August 2018, the NDRC announced that Chinese steelmaking capacity closures had reached 24.7 mmt as of the end of July 2018 (State Council, 2018[13]).

Looking at gross capacity additions, new investments are now underway or planned, especially in the coastal areas of China. These investments are aimed at enabling the production of high value-added steel products to meet demand for flat products in, for example, the automotive and home appliance industries. Shougang Group is proceeding with an expansion project in its subsidiary, the Shougang Jingtang United Iron and Steel

(Shougang Jingtang). This project entails the installation of Basic Oxygen Furnace (BOF) facilities with a capacity of 5.0 mmt in Caofeidan port, Hebei province (China Metallurgical News, 2015[14]).[5] Sinogiant Steel Group is making a greenfield investment, the Hebei Zongheng Fengnan Steel steelworks (located in Fengnan district, a coastal site of Tangshan city, Hebei province), adding 7.7 mmt of BOF capacity (Sinogiant Steel Group, n.d.[15]). HBIS Group is constructing a new integrated steel plant, HBIS Laoting Steel, with a capacity of 7.47 mmt in Laoting area, Hebei province (Reuters, 2017[16]) (Metal Expert, 2017[17]). In June 2018, Guangxi Liuzhou Iron and Steel Group started construction of new steelmaking facilities with a capacity of 14.7 mmt in Fangchenggang area, Guangxi province (Platts, 2018[18]) (Guangxi News, 2018[19]). All these projects could become operational within 2019, if their construction is completed as scheduled. Baosteel Zhanjiang Iron and Steel has announced a plan to expand steelmaking capacities by 3.6 mmt, which is scheduled to become operational in July 2021 (Baosteel, 2018[20]) (Platts, 2018[21]).[6]

In addition, many steel companies in China are installing new EAF facilities.[7] According to publicly available sources used to update the OECD's monitoring databases, a total of 5.2 mmt of EAF capacity in China started operations up to end of 2018. These investments included Lishui Huahong with a capacity of 0.77 mmt (China Metallurgical Group Corporation, 2018[22]), Chongqing Zuhang with a capacity of 1.54 mmt (Chongqing Shuangqiao Economic and Technological Development Zone, 2018[23]), Tangshan Yutian Jinzhou with a capacity of 1.54 mmt (LangeSteel, 2018[24]) and Luoyang Steel with a capacity of 1.35 mmt (Luoyang Luogang Group, 2018[25]).

Box 2. Capacity replacement measures in China

The Ministry of Industry and Information Technology (MIIT) published the "replacement measure", effective from 1 January 2018, which revised and updated the measures released on April 2015. Specific measures to link the replacement and reduction of capacity were first introduced in 2010 and further revised subsequently. In the last revision in 2015, the policy set out a "replacement" ratio of a minimum of 1.25 tonnes of backward capacity to be reduced for each tonne of new capacity in the Beijing, Tianjin and Hebei areas and the Yangtze and Pearl River deltas. The 2018 revision of this measure specifies that the ratio of replacement of existing capacity versus new capacity installed would continue to be no less than 1.25:1 in the same areas. In other regions, the capacity to be phased out should be larger than the amount of new capacity (ratio>1). However, steelmakers are permitted to carry out the replacement of their existing BOFs with EAFs at a one-to-one ratio of existing capacity versus new capacity, justified by energy efficiency and emission reductions goals (MIIT, 2018[26]) (MIIT, 2015[27]) (Platts, 2018[28]) (Platts, 2018[29]).

Steelmaking capacity in India has been expanding at a fast rate in recent years. Further growth is expected over the short- to medium-term due to increasing demand, notably from infrastructure investments. In June 2018, Steel Authority of India Ltd (SAIL) completed the 3.0 mmt expansion of BOF facilities at the Bhilai Steel Plant in the state of Chhattisgarh (SAIL, 2018[30]) (Metal Expert, 2018[31]). In August 2018, India's Mono Steel launched new steelmaking facilities in its Kutch plant, in the state of Gujarat, with a capacity of 0.25 mmt (Metal Expert, 2018[32]). The National Mineral Development Corporation (NMDC) is constructing greenfield steelworks in the state of Chhattisgarh, with BOF capacity of 3

mmt, while Shree Uttam Steel and Power Ltd. is also installing a greenfield BOF plant in the state of Maharashtra with a capacity of 1.55 mmt. All these are expected to be operational in 2019, respectively (Metal Expert, 2019[33]).[8] In addition, JSW Steel has started an expansion project of BOF facilities at its Dolvi works in Maharashtra, raising capacity by 5.0 mmt by 2020 (JSW Steel Limited, 2018[34]) (Platts, 2017[35]). JSW Steel announced a plan to increase steelmaking capacity of its Vijayanagar Works by 3.0 mmt, which is likely to be completed by 2020 (JSW Steel Limited, 2018[36]). As a result of investment projects that are underway, steelmaking capacity in India could reach 137.6 mmt by 2021, in the absence of closures. If this materialises, India could become the world's second largest steel economy in terms of steelmaking capacity.

Crude steelmaking capacity has expanded rapidly in the Association of South East Asian Nations (ASEAN) region over the past decade. Steelmaking capacity in ASEAN-6 could continue to increase from 54.1 mmt in 2017 to 64.8 mmt by 2021 (+21.2%).[9] In the Philippines, SteelAsia Manufacturing started the construction of a new 0.8 mmt EAF plant at Compostela Works in Cebu province, which is expected to begin operation in 2020 (SteelAsia Manufacturing Corp., 2018[37]) (Metal Expert, 2018[38]). In Viet Nam, Vietnam-Japan Steel (Vija) commissioned new steelmaking facilities with a capacity of 0.35 mmt in April 2018 (Danieli, 2016[39]) (Metal Expert, 2018[40])[10]. Viet Nam's Hoa Phat Group is constructing a new integrated steel plant with BOF capacity of 2.0 mmt in the Dung Quat Economic Zone, Quang Ngai province, which is expected to be complete in 2019 (Hoa Phat Group, 2018[41]). In addition, Hoa Phat Group has a plan to add more 2.0 mmt BOF in the same plant.[11]

Solid steel demand growth has attracted many foreign investors to the ASEAN region and there are several new investment projects supported by Chinese companies. For instance, Alliance Steel, which is a joint venture between China's Guangxi Beibu Gulf Port International Group and China's Guangxi Shenlong Metallurgical Company, has started the operation of BOF facilities with a capacity of 3.5 mmt in Kuantan Industrial Park, Malaysia in June 2018 (Metal Expert, 2018[42]). Gunung Gahapi Sakti (GGS) is installing a new EAF plant that has a 0.5 mmt capacity, as part of a joint venture with China's Nanjing Iron and Steel at Medan in north Sumatra, Indonesia, which is expected to start operation in 2019 (Gunung Steel Group, 2017[43]) (Metal Expert, 2018[44]). Dexin Steel Indonesia, a joint venture between China's Delong Holdings Limited, China's Shanghai Decent Investment Group and Indonesia's PT Indonesia Morowali Industrial Park, has started the construction of a new 3.5 mmt BOF steel mill in Morowali Industrial Park, Central Sulawesi province, with the start of production scheduled for 2019 (Delong Holdings, 2018[45]). In December 2018, China's HBIS Group, Huili Investment Fund Management, the Philippine's SteelAsia Manufacturing Corporation and PHIVIDEC Industrial Authority signed a memorandum to jointly develop a new integrated steel mill in Misamis Oriental, Philippines, with a steelmaking capacity of 0.6 mmt to be installed during the first phase of the project, and it would eventually reach 8.0 mmt through the second phase (Philippine Board of Investment, 2018[46]) (Reuters, 2018[47]).

Elsewhere in Asia, Bangladesh's Kabir Group of Industries (KSRM) has commissioned a new induction furnace (hereafter IF) facility with a capacity of 0.5 mmt in August 2018 in Chittagong (Metal Expert, 2018[48]). Bangladesh Steel Re-Rolling Mills (BSRM) and GPH Ispat are also constructing new steelmaking facilities, namely 0.9 mmt IF and 0.815 mmt EAF equipment, respectively, that are expected to become operational in 2019 (Metal Expert, 2018[48]). In Pakistan, Amreli Steels and Faizan Steel Mills are expanding their steelmaking capacity by 0.2 mmt and 0.08 mmt, respectively, which are also expected to

be completed in 2019 (Amreli Steel, 2018[49]) (Metal Expert, 2018[50]). Pakistan's Agha Steel Industries and Naveena Steel also have plans of installing new steelmaking facilities, respectively with capacities of 0.6 mmt and 0.27 mmt within the year 2019 (Metal Expert, 2019[33]) (Primetals Technologies, 2018[51]). In September 2018, Druk Holding and Investments Limited (DHI), with the Indian partner Mr. Dilip Kumar Goenka, started the construction of a greenfield steel plant with a capacity of 0.2 mmt (IF) 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 (Druk Holding and Investments Limited, 2018[52]).

3.3. CIS

In the Commonwealth of Independent States (CIS) region, Russian steelmaker Tulachermet-Steel is installing a 1.8 mmt BOF in the Central Federal District, which is expected to become operational in 2019.[12] In addition, the modernisation of steel manufacturing facilities continue to take place in the region, with outdated Open Hearth Furnaces (OHF) being shut down. Russia's OMK closed its two OHF facilities at Vyksa works in March 2018, which had a total of 0.46 mmt of steelmaking capacity (OMK, 2018[53]).[13] In Ukraine, Zaporizhstal Iron and Steel Works has a plan to replace its OHF that has a capacity of around 4.0 mmt with new BOF with a capacity of 3.2 mmt (Platts, 2018[54]).[14] In addition, Uzbekistan's Uzmetkombinat has announced a plan to expand EAF capacities by 1.0 mmt by 2020 (The Tashkent Times, 2018[55]) (Metal Expert, 2019[33]). Taking only projects that are underway into account, the CIS region's steelmaking capacity could increase from 142.4 mmt in 2018 to 144.2 mmt by 2021 (+1.3%) in the absence of any further closures.

3.4. Europe

Steelmaking capacity in the region called "Europe", which includes Turkey, remained stable at around 274 mmt between 2017 and 2018. However, in the absence of additional closures, steelmaking capacity in the region could increase again to 278.7 mmt in the period 2019-2021 (+1.6%), based on information currently available on possible gross capacity additions. There are several investments underway in Turkey. Kardemir has announced a steelmaking capacity expansion at its BOF plant in Karabuk province, amounting to 0.7 mmt of capacity expected to become operational in 2019 (Kardemir, 2018[56]) (Metal Expert, 2018[57]). Mescier Iron and Steel is constructing new EAF facilities with a capacity of 0.9 mmt in Bartin, northern Turkey, aiming to start production in June 2019 (Mescier Iron and Steel, n.d.[58]) (Metal Expert, 2018[59]). In addition, Tosyali Holding is proceeding with the construction of a new EAF plant with the capacity to produce 2.5 mmt of crude steel in the Iskenderun Bay, which is expected to start operation in 2020 (Tosyali Holding, n.d.[60]) (Metal Expert, 2017[61]).

In the European Union, Van Merksteijn International has announced a plan to install an EAF plant with a capacity of 1.0 mmt at the seaport of Eemshaven in the north of the Netherlands, which could start production by 2020 (Danieli, 2018[62]). In May 2018, India's JSW group, the new owner of Italy's Aferpi, announced plans to resume steelmaking production at the Piombino site by installing two new EAFs by 2020 (FIOM-CIGL, 2018[63]) (Platts, 2018[64]).[15][16]

3.5. Latin America

In Latin America, Ecuador's Adelca and Paraguay's Vemarcorp S.A. have commissioned new steelmaking facilities with a capacity of 0.4 mmt (EAF) and 0.15 mmt (IF) in 2018 (Metal Expert, 2018[65]; Metal Expert, 2018[66]). On the other hand, in July 2018, Vallourec Tubos do Brasil closed its BOF facilities in Belo Horizonte, Brazil, which had a capacity to produce 0.6 mmt of steel (Vallourec, 2018[67]) (Metal Expert, 2018[68]). For the region as a whole, Latin America's steelmaking capacity remained stable at around 74.7 mmt between 2017 and 2018.

There is only one capacity investment underway in the region that will become operational during the 2019-2021 period. Bolivia's 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. The project started in November 2017 and operations are expected to begin in 2019 (Platts, 2017[69]) (Metal Expert, 2019[33]). Amongst other projects, Bolivia's Empresa Siderurgica del Mutun plans to install a new EAF plant with a capacity of 0.15 mmt in El Mutún, Santa Cruz. Construction of the plant could start in the beginning of 2019 and operations would begin by no later than 2020 (Metal Expert, 2018[70]). 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 MECC, 2016[71]). Peru's Aceros Arequipa has a plan to replace a current 0.85 mmt EAF with a new 1.25 mmt EAF by 2020 (Aceros Arequipa, 2018[72]). Venezuela's Siderurgica Nacional had suspended construction of an integrated steel plant including EAF with a capacity of 1.55 mmt in Ciudad Piar, Bolivar.[17] At this stage, there is no further information on whether this project is still going forward. Overall, steelmaking capacity in Latin America could slightly increase by 0.3% to 74.9 mmt by 2021.

3.6. Middle East

Steelmaking capacity has increased rapidly over the past decade in the Middle East, from 27.8 mmt in 2008 to 64.4 mmt in 2017 (+131.7%). Capacity increased by 2.9 mmt (+4.6%) between 2017 and 2018. Rapid growth is expected to continue over the next few years and steelmaking capacity could increase to 92.4 mmt by 2021 (+37.3%) if all the projects that are underway come on stream and in the absence of closures.

Iran is likely to be the largest contributor to the steelmaking capacity expansion in the region. A total of 2.9 mmt of steelmaking capacity started operations in 2018. These investments included Chadormalu Steel with a capacity of 0.3 mmt, Ardestan Steel Complex with a capacity of 0.5 mmt, Sarmad Iron and Steel Company with a capacity of 0.6 mmt, Bistoun Steel with a capacity of 0.4 mmt, Bardsir Sponge Iron and Steel Plant with a capacity of 1.0 mmt and Shahrood Steel with a capacity of 0.1 mmt (Metal Expert, 2019[33]). During the period 2019-2021, if all other projects that are currently underway are completed as scheduled, Iran's nominal crude steelmaking capacity would reach 57.5 mmt by 2021, i.e. an increase of 71% when compared to the capacity level of 33.6 mmt at the end of 2018. Iran is committed to attracting foreign investment for its steelmaking capacity projects.[18] However, the plan by Iranian Mines and Mining Industries Development and Renovation Organization (IMIDRO) to install a new steelmaking plant with a capacity of 1.6 mmt in Iran was cancelled in 2018. This was a joint-venture project that had been planned with Korea's POSCO Engineering and Construction (Metal Expert, 2018[73]) (Platts, 2018[74]). The Chinese Metallurgical Corporation of China (MCC) had agreed with

IMIDRO to finance some of the steelmaking capacity projects some years ago, but there is no additional information on the latest status of these projects (Reuters, 2014[75]).[19]

Elsewhere in the region, Saudi Arabia's Factory Rabigh Steel Industry expanded the steelmaking capacity of its IF by 0.038 mmt in August 2018 (Metal Expert, 2018[76]). Oman's Moon Iron and Steel (MISCO) is building a new 1.2 mmt EAF plant, which is expected to be operational in 2019 (Metal Expert, 2018[77]) (SMS Group, 2016[78]). Iraq's United Brothers Holding has a plan to install a new EAF facility with a capacity of 0.5 mmt, in the industrial area of Khor Al Zubair, near Basra by 2019 (Danieli, 2018[79]).

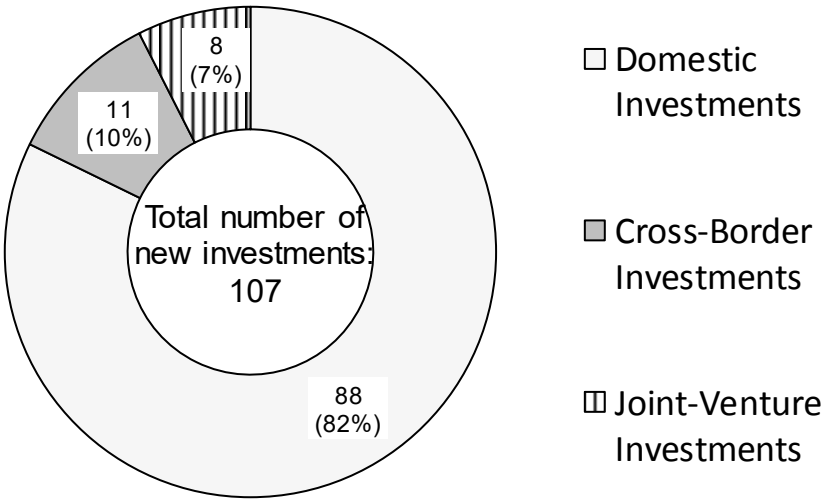
3.7. NAFTA

In the NAFTA region, crude steelmaking capacity increased slightly by 0.4% to 154.4 mmt in 2018. Mexico's Industrias CH, Grupo Simec, started operation of a new EAF with a capacity of 0.6 mmt in February 2018 (Danieli, 2018[80]). In the United States, Nucor Corporation is installing a new EAF mill with a capacity to produce 0.3 mmt in Sedalia, Missouri, with a view to starting operation in 2019 (Nucor Corporation, 2017[81]) (Danieli, 2018[82]). Nucor Corporation also announced a plan to build a second new EAF mill with a capacity of 0.3 mmt in Frostproof, Florida, with a view to start operations in 2020 (Nucor Corporation, 2018[83]). In addition, Big River Steel, Steel Dynamics and Australia's BlueScope Steel also announced plans to install new EAF facilities, respectively.[202122] Taking only projects that are underway into account, steelmaking capacity in the NAFTA region could increase by 0.3 mmt (+0.2%) to 154.7 mmt by 2021 in gross terms.

4. The latest developments in cross-border investments

Figure 3 shows the share of domestic and cross-border investments in steelmaking capacity. In total, there are 107 new steelmaking capacity projects around the world, classified as underway or planned, that are scheduled to become operational in 2018 or later — this includes projects that have started operation in 2018, as well as projects for which the start date is not available. Of these projects, domestic steelmakers are the investors/owners in 88 (82%) of the cases. Of the remaining steelmaking capacity projects, 11 (10%) entail cross-border investments, representing an investment that is based wholly on one or on several foreign investors/owners, and eight (7%) are structured as joint ventures (JV) between domestic and foreign investors/owners (Figure 3).

Figure 3. The share of domestic and cross-border investments in new steelmaking capacity projects underway or planned for 2018 or later



Note: This figure includes all new investment projects that are, underway or planned, and which are scheduled to become operational in 2018 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/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 six cross-border and six joint venture investments between domestic and foreign investors. Africa attracts one cross-border investment and one JV. Latin America has one JV while Europe and NAFTA have two cross-border investments respectively. The CIS, Middle East and Oceania regions currently have no cross-border investments nor JV investments.

Table 2. Domestic and cross-border investments in new steelmaking capacity projects underway and planned investments for 2018 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	4	2.9	1	2.3	1	2.0
Asia	30	94.2	6	22.5	6	15.2
CIS	3	6.0	0	0.0	0	0.0
Europe	4	5.1	2	0.0	0	0.0
Latin America	5	3.6	0	0.0	1	0.2
Middle East	37	33.2	0	0.0	0	0.0
NAFTA	5	5.5	2	0.6	0	0.0
Oceania	0	0.0	0	0.0	0	0.0
World Total	88	150.4	11	25.4	8	17.4

Note: This table includes all new investment projects that are, underway or planned, and which are scheduled to become operational in 2018 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

Table 3 provides a two-way matrix of the cross-border and joint venture investments by economy. Chinese companies account for two cross-border investments and participate in five JV investments abroad.[23] ASEAN is the most attractive region for Chinese companies, who are also investing in Latin America. Malaysia is the location for two cross-border Chinese investments, while Indonesia is the location for two JV investments by Chinese companies.[24] In the Philippines, there are two JV investments with Chinese companies.

Regarding the other investments, two Chinese Taipei companies and a Japanese company are jointly investing in two cross-border projects in Viet Nam.[2526] An Indian company has two cross-border investments in Italy and one cross-border investment in the United States.[27] Another Indian company is involved in one joint venture project with a Bhutanese counterpart. A company from the U.A.E. has two cross-border investments in Pakistan (Danieli, 2015[84]). Investors from Turkey and Australia have one cross-border investment each, respectively in Algeria and the United States. Investors from Korea and Qatar have one joint venture project each, respectively with companies in Indonesia and Algeria.[28]

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

A. Cross-Border Investments

		Location where the investment is taking place											
		Africa		Asia						Europa		NAFTA	
		Algeria		Malaysia		Pakistan		Viet Nam		Italy		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	0	0.0	2	8.5	0	0.0	0	0.0	0	0.0	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	2	n/a	1	n/a
Europe	Turkey	1	2.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Middle East	UAE	0	0.0	0	0.0	2	1.0	0	0.0	0	0.0	0	0.0
Oceania	Australia	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.6

B. Joint Venture Investments

		Location where the investment is taking place									
		Africa		Asia						Latin America	
		Algeria		Bhutan		Indonesia		Philippines		Bolivia	
Foreign JV partner: firm based in		Number	Capacity (mmt)	Number	Capacity (mmt)	Number	Capacity (mmt)	Number	Capacity (mmt)	Number	Capacity (mmt)
Asia	China	0	0.0	0	0.0	2	4.0	2	8.0	1	0.2
	India	0	0.0	1	0.2	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
Middle East	Qatar	1	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 2018 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 summarises the plant level database providing the developments in underway or planned steelmaking capacity investments - including projects that have started operation in 2018, according to publicly available information.

Table 4. Investment data

REGION	ECONOMIES	LOCATION	COMPANY	OWNER (ECONOMIES)	EQUIPMENT	CAPACITY (thousand metric tonnes)	STATUS	START	SOURCES
Africa	Algeria	Bethioua	Tosyali	Tosyali Holding (Turkey)	EAF	2 300	operating	2018	Platts, Metal Expet
Africa	Algeria	Bellara, Jijel	Algerian Qatari Steel	IMETAL (Algeria), Qatar Steel (Qatar)	EAF	2 000	underway	2019	Company HP, Platts
Africa	Algeria	Berrahal	ETRHB	The ETRHB HADDAD Group (Algeria)	EAF	800	plan	2020	Company HP, Metal Expert
Africa	Egypt	Sokhna, Suez	Ezz Rolling Mills (ERM)	Ezz Steel (Egypt)	EAF	850	underway	2019	World Steel Capacities
Africa	Namibia	Oshikango, Ohangwena region	Groot Group	Groot Group (Namibia)	Steelmkg	1 000	plan	2020	Company HP
Africa	Nigeria	Lagos	Standard Metallurgical Company	Standard Metallurgical Company (Nigeria)	EAF	250	operating	2018	Company HP, Metal Expert
Asia	Bangladesh	Ghoramora, Bara Kumira, Sitakunda, Chittagong	KSRM	Kabir Group of Industries (Bangladesh)	IF	500	operating	2018	Metal Expert
Asia	Bangladesh	Masjiddah, Kumira, Sitakunda, Chittagong	GPH Ispat Ltd	GPH Ispat Ltd (Bangladesh)	EAF	815	underway	2019	Company HP, Metal Expert
Asia	Bangladesh	Chittagong	Bangladesh Steel Re-Rolling Mills (BSRM)	BSRM (Bangladesh)	IF	900	underway	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
Asia	China	Lishui city, Zhejiang	Lishui Huahong (丽水华宏钢铁制品有限公司)	Lishui Huahong Iron & Steel Products Co., Ltd (China)	EAF	770	operating	2018	Company HP(中国一冶集团), Wood Mackenzie
Asia	China	Shuangqiao Economic Development Zone, Chongqing	Chongqing Zuhang (重庆足航钢铁有限公司)	Chongqing Zuhang Iron & Steel Co., Ltd (China)	EAF	1 540	operating	2018	Chongqing Shuangqiao Economic and Technological Development Zone HP(重庆市双桥经济技术开发区), Wood Mackenzie

REGION	ECONOMIES	LOCATION	COMPANY	OWNER (ECONOMIES)	EQUIPMENT	CAPACITY (thousand metric tonnes)	STATUS	START	SOURCES
Asia	China	Guojiatun, Yutian, Tangshan City	Tangshan Yutian Jinzhou (玉田金州实业)	Tangshan Yutian Jinzhou Industrial Co., Ltd.(China)	EAF	1 540	operating	2018	LangeSteel (兰格钢铁), Wood Mackenzie
Asia	China	Luoyang City, Henan Province	Luoyang Steel (河南洛阳洛钢集团钢铁有限公司)	Luoyang Luogang Group Steel Co., Ltd. (China)	EAF	1 350	operating	2018	Company HP, Wood Mackenzie
Asia	China	Caofeidian port, Hebei	Shougang Jingtang United Iron and Steel (首钢京唐公司)	Shougang Group (China)	BOF	5 000	underway	2019	Platts, Wood Mackenzie, Xinhuanet (新华网), China Metallurgical News (中国冶金报社)
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	underway	2019	Company HP, Platts, Metal Expert, Wood Mackenzie
Asia	China	Laoting, Hebei	HBIS Laoting Steel(河钢乐亭钢铁)	Hebei Iron and Steel (HBIS) (China)	BOF	7 470	underway	2019	Platts, Metal Expert, Wood Mackenzie, Reuters
Asia	China	Fangchenggang, Guangxi	Liuzhou Iron and Steel (柳州钢铁)	Guangxi Liuzhou Iron and Steel Group (China)	BOF	14 700	underway	2019	Platts, Wood Mackenzie, Guangxi News(广西新闻网版)
Asia	China	Zhanjiang, Guangdong	Baosteel Zhanjiang Iron and Steel Co., Ltd. (湛江钢铁)	Baowu Iron and Steel Group (China)	BOF	3 600	plan	2021	Company HP, Platts, Metal Expert, Wood Mackenzie
Asia	India	Bhilai, Chhattisgarh	Steel Authority of India Ltd (SAIL)	Steel Authority of India Ltd (SAIL) (India)	BOF	3 000	operating	2018	Company HP, Metal Expert
Asia	India	Anjar, Kutch, Gujarat	Mono Steel (India) Ltd. / Kutch plant	Mono Steel (India) Ltd.	IF	250	operating	2018	Metal Expert
Asia	India	Dilmili, Chhattisgarh	NMDC	NMDC (India)	BOF	3 000	underway	2019	Company HP, Metal Expert
Asia	India	Sindhudurg, Maharashtra	Shree Uttam Steel and Power Ltd	Uttam Galva Steels Ltd(UGSL) (India)	BOF	1 550	underway	2019	World Steel Capacities
Asia	India	Dolvi, Maharashtra	JSW Steel / Dolvi works	JSW Holdings (India)	BOF	5 000	underway	2020	Company HP, Platts, World Steel Capacities
Asia	India	Toranagallu, Karnataka	JSW Steel / Vijayanagar Works	JSW Holdings (India)	BOF	3 000	plan	2020	Company HP, Platts
Asia	India	Kalinganagar, Odisha	Tata Steel / Kalinganagar	Tata Steel (India)	BOF	5 000	plan	n/a	Company HP, Platts
Asia	India	Jamshedpur, Jharkhand	Tata Steel / Jamshedpur	Tata Steel (India)	EAF	1 300	plan	n/a	Company HP, Platts
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	underway	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	2019	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	Malaysia	Kuantan Industrial Park	Alliance Steel	Guangxi Beibu Gulf Iron and Steel Investment (China)	BOF	3 500	operating	2018	Company HP, Platts, Metal Expert, Wood Mackenzie
Asia	Malaysia	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	Pakistan	Karachi	Faizan Steel Mills	Faizan Steel Group	IF	80	underway	2019	World Steel Capacities

REGION	ECONOMIES	LOCATION	COMPANY	OWNER (ECONOMIES)	EQUIPMENT	CAPACITY (thousand metric tonnes)	STATUS	START	SOURCES
Asia	Pakistan	Dhabeji	Amreli Steels / Dhabeji plant	Amreli Steels (Pakistan)	IF	200	underway	2019	Company HP, Metal Expert
Asia	Pakistan	Port Qasim, Karachi	Agha Steel Industries	Agha Steel Industries(Pakistan)	EAF	600	plan	2019	Company HP, World Steel Capacities
Asia	Pakistan	Port Qasim, Karachi	Naveena Steel Mills	Naveena Group (Pakistan)	IF	270	plan	2019	Company HP, Metal Expert
Asia	Pakistan	n/a	Taybah Steel, MI.DA	Taybah Steel Group (UAE)	EAF	500	plan	2020	Company HP, Metal Expert
Asia	Pakistan	n/a	Taybah Steel, MI.DA	Taybah Steel Group (UAE)	EAF	500	plan	n/a	Company HP, Metal Expert
Asia	Philippines	Compostela, Cebu	SteelAsia Manufacturing / Compostela Works	SteelAsia Manufacturing (Philippines)	EAF	800	underway	2020	Company HP, Platts, Metal Expert, Wood Mackenzie
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	Department of Trade and Industry of Philippines, Platts, Reuters
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	Department of Trade and Industry of Philippines, Platts, Reuters
Asia	Viet Nam	Hai Phong	Vietnam-Japan Steel (Vija)	Vietnam-Japan Steel (Vija) (Viet Nam)	EAF	350	operating	2018	Company HP, Metal Expert
Asia	Viet Nam	Dung Quat Industrial Park, Quang Ngai	Hoa Phat Dung Quat	Hoa Phat Group (Viet Nam)	BOF	2 000	underway	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	plan	2019	Company HP, Platts, 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	3 000	plan	n/a	Company HP, 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, World Steel Capacities
CIS	Russia	Tula, Central Federal District	Tulachermet-Steel	Industrial Metallurgical Holdings (Russia)	BOF	1 800	underway	2019	Company HP, Metal Expert
CIS	Ukraine	Zaporizhzhya	Zaporizhstal Iron and Steel Works	Metinvest (Ukraine)	BOF	3 200	plan	2022	Platts, World Steel Capacities
CIS	Uzbekistan	Bekobod	Uzmetkombinat	Uzmetkombinat (Uzbekistan)	EAF	1 000	plan	2020	The Tashkent Times, World Steel Capacities
Europe	Netherlands	Eemshaven	Van Merksteijn International	Van Merksteijn International (Netherlands)	EAF	1 000	plan	2020	Company HP, World Steel Capacities
Europe	Italy	Piombino	Aferpi	JSW Holdings (India)	EAF	n/a	plan	2020	FIOM-CGIL HP, Platts, Metal Expert
Europe	Italy	Piombino	Aferpi	JSW Holdings (India)	EAF	n/a	plan	2021	FIOM-CGIL HP, Platts, Metal Expert
Europe	Turkey	Karabuk	Kardemir	Kardemir (Turkey)	BOF	700	underway	2019	Company HP, Platts, World Steel Capacities
Europe	Turkey	Bartin	Mescier Iron and Steel	Mescier Iron and Steel (Turkery)	EAF	900	underway	2019	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
Latin America	Bolivia	San Jacinto, Buena Vista municipality, Santa Cruz district	La Siderurgica Las Lomas	Las Lomas (Bolivia)	n/a	200	underway	2019	Platts, Metal Expert
Latin America	Bolivia	El Mutún, Santa Cruz	Empresa Siderurgica del Mutun	Empresa Siderurgica del Mutun (Bolivia), Sinosteel Equipment (China)	EAF	150	plan	2020	Platts, World Steel Capacites

REGION	ECONOMIES	LOCATION	COMPANY	OWNER (ECONOMIES)	EQUIPMENT	CAPACITY (thousand metric tonnes)	STATUS	START	SOURCES
Latin America	Ecuador	Milagro, province of Guayas	Adelca / Milagro Iron and Steel Plant	Adelca (Ecuador)	EAF	400	operating	2018	World Steel Capacities
Latin America	Paraguay	Villa Hayes	Vemarcorp S.A. / Saladillo plant	Vemarcorp S.A. (Paraguay)	IF	150	operating	2018	Company HP, Metal Expert
Latin America	Peru	Pisco	Aceros Arequipa	Aceros Arequipa (Peru)	EAF	1 250	plan	2020	Company HP
Latin America	Venezuela	Ciudad Piar, Bolivar	Siderurgica Nacional	Siderurgica Nacional (Venezuela)	EAF	1 550	plan	n/a	Company HP, Metal Expert
Middle East	Iran	Ardakan, Yazd	Chadormalu Steel Co	Chadormalu Mining and Industrial Co. (Iran)	EAF	300	operating	2018	Metal Expert
Middle East	Iran	Ardestan, Isfahan	Ardestan Steel Complex	Ardestan Steel Company (Iran)	EAF	500	operating	2018	Metal Expert
Middle East	Iran	Abarkuh, Yazd, Sarmad Abarkuh	Sarmad Iron and Steel Company	Chadormalu Mining and Industrial Co. (Iran), Mines and Metal Development Investment Company(Iran)	EAF	600	operating	2018	Metal Expert, Wood Mackenzie
Middle East	Iran	Bardsir, Kerman province	Bardsir Sponge Iron and Steel Plant - Bardsir Steel Making Plant	Middle East Mines Industries Development Holding Company (MIDHCO) (Iran)	EAF	1 000	operating	2018	Company HP, Metal Expert
Middle East	Iran	Kermanshah	Bistoun Steel	Bistoun Steel (Iran)	IF	400	operating	2018	Metal Expert
Middle East	Iran	Sadr	Shahrood Steel Co	Shahrood Steel Co (Iran)	IF	100	operating	2018	Company HP, Metal Expert
Middle East	Iran	Esfahan	Natanz Steel Industries	Natanz Steel Industries (Iran)	EAF	850	underway	2019	World Steel Capacities
Middle East	Iran	Shiraz	Fasa Steel Complex Co (Fasco)	Fasa Steel Complex Co (Fasco) (Iran)	EAF	1 500	underway	2019	Company HP, Platts, World Steel Capacities
Middle East	Iran	Fars	Eghlid Steel Company	Eghlid Steel Company (Iran)	EAF	1 500	underway	2019	Platts, World Steel Capacities
Middle East	Iran	Eshtehard, Alborz	Aria Zob Steel Complex	Aria Zob Steel Company	EAF	500	underway	2019	World Steel Capacities
Middle East	Iran	Mashhad, Razavi Khorasan	Kabkan Steel Company	Shekofteh Industrial Group (Iran)	EAF	150	underway	2019	World Steel Capacities
Middle East	Iran	South Khorasan	Ghaenat Steel Complex	IMIDRO / Private section (Iran)	EAF	800	underway	2019	Company HP, Metal Expert
Middle East	Iran	Sirjan, Kerman	Jahan Foolad Sirjan Steel Complex	Golgohar Mining and Industrial Co. (Iran)	EAF	1 300	underway	2019	Company HP, Metal Expert
Middle East	Iran	Zarand, Kerman	Zarand Iron and Steel Company (ZISCO)	Middle East Mines Industries Development Holding Company (MIDHCO) (Iran)	BOF	1 700	underway	2019	Company HP, Metal Expert
Middle East	Iran	Bandar Abbas	Kish South Kaveh Steel	Kaveh Pars Mining Industries Company (Iran)	EAF	1 200	underway	2019	Company HP, Metal Expert
Middle East	Iran	Charmahal-va-Bakhtiyari	Morarakeh Steel / Sefid Dasht Steel Complex (Chaharmahal Bakhtiari)	IMIDRO (Iran)	EAF	1 000	underway	2019	Company HP, Metal Expert
Middle East	Iran	Abhar, Zanjan	West Alborz Steel Co.	West Alborz Steel Co. (Iran)	EAF	1 000	underway	2019	Company HP, Metal Expert
Middle East	Iran	Buin Zahra, Qazvin	Arian Steel	Arian Steel (Iran)	EAF	550	underway	2019	Metal Expert
Middle East	Iran	Dezful, Khorasan province	South Rohina Steel / Dezful Steel	South Rohina Steel (Iran)	EAF	450	underway	2019	Metal Expert, Wood Mackenzie
Middle East	Iran	Yazd	Iran Alloy Steel Company	Iran Alloy Steel Company (Iran)	EAF	200	underway	2019	Platts, World Steel Capacities, Wood Mackenzie

REGION	ECONOMIES	LOCATION	COMPANY	OWNER (ECONOMIES)	EQUIPMENT	CAPACITY (thousand metric tonnes)	STATUS	START	SOURCES
Middle East	Iran	Sabzevar, Razavi Khorasan province	Sabzevar Steel Complex	IMIDRO (Iran)	EAF	800	underway	2019	Metal Expert
Middle East	Iran	Chatroud, Kerman Province	Butia Steel Company	Middle East Mines Industries Development Holding Company (MIDHCO) (Iran)	EAF	1 500	underway	2019	Metal Expert
Middle East	Iran	Abarkooh, Yazd	Abar Kouh Steel and Rolling	Chadormalu Mining and Industrial Co. (Iran)	EAF	600	underway	2019	World Steel Capacities
Middle East	Iran	Arvand, Khoramshahr	Arvand Jahanara Steel Company (Phase 1)	Arvand Jahanara Steel Company (Iran)	EAF	1 200	underway	2019	World Steel Capacities
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	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	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	Hormozgan, Hormozgan	Mobarakeh Steel / Hormozgan Steel Complex	IMIDRO (Iran)	EAF	1 500	underway	2020	Platts, World Steel Capacities
Middle East	Iran	Chabahar city, Sistan and Baluchestan	Makran Steel Complex	IMIDRO (Iran)	EAF	3 200	underway	2020	Metal Expert
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	Sadr	Shahrood Steel Co	Shahrood Steel Co (Iran)	IF	100	plan	2021	Metal Expert
Middle East	Iran	Shadegan, Khuzestan	Shadegan Steel Complex	Khouzestan Steel (Iran), IMIDRO (Iran)	EAF	1 000	plan	n/a	Company HP, Metal Expert
Middle East	Iran	Kurdistan province	Kurdistan Steel	IMIDRO (Iran)	n/a	1 500	plan	n/a	Company HP, Platts
Middle East	Iraq	Khor Al-Zubair, Basra	State Company for Iron and Steel (SCIS)	United Brothers Holding (Iraq)	EAF	500	plan	2019	Company HP, World Steel Capacities
Middle East	Oman	Sohar	Moon Iron and Steel (MISCO)	Moon Iron and Steel (MISCO) (Oman)	EAF	1 200	underway	2019	Company HP, Metal Expert
Middle East	Saudi Arabia	Rabigh	Factory Rabigh Steel Industry	Factory Rabigh Steel Industry (Saudi Arabia)	IF	38	operating	2018	Metal Expert
Middle East	Saudi Arabia	Ras Al-Khair	Gulf Tubing Co	Gulf Tubing Co (Saudi Arabia)	EAF	600	plan	2019	Company HP, World Steel Capacities
NAFTA	Mexico	Apizaco, Tlaxcala	Grupo SIMEC Long Products	Industrias CH (Mexico)	EAF	600	operating	2018	Company HP, Metal Expert
NAFTA	United States	Sedalia, Missouri	Nucor Steel Sedalia	Nucor Steel (United States)	EAF	318	underway	2019	Company HP, World Steel Capacities
NAFTA	United States	Frostproof, Florida	Nucor Steel Florida	Nucor Steel (United States)	EAF	318	plan	2020	Company HP, Platts, World Steel Capacities
NAFTA	United States	Osceola, Arkansas	Big River Steel	Big River Steel (United States)	EAF	1 496	plan	2020	Company HP, Metal Expert
NAFTA	United States	Southwest U.S.	Steel Dynamics, Inc.	Steel Dynamics, Inc. (United States)	EAF	2 722	plan	2021	Company HP. Platts, Metal Expert
NAFTA	United States	Delta, Ohio	North Star BlueScope Steel	BlueScope Steel (Australia)	EAF	600	plan	n/a	Company HP, The Wall Street Journal, Platts, Metal Expert
NAFTA	United States	Baytown, Texas	JSW USA	JSW Holdings (India)	EAF	n/a	plan	n/a	Company HP, Platts, Metal Expert

Source: Company HP and media sources in the table.

Annex B. AVAILABLE EVIDENCE OF PLANT LEVEL CLOSURES

The closure information collected in Table 5 is based on plant-level data originally obtained from public and commercial sources, in particular from media reports, but does not represent an exhaustive list of closures. Table 5 summarises the plant-level closure information, which were reported by public and commercial sources within the year of 2018.

Table 5. Closure data

REGION	ECONOMIES	LOCATION	COMPANY	EQUIPMENT	TYPE OF CLOSURE	CAPACITY (thousand metric tonnes)	YEAR	SOURCES
Asia	China	n/a	n/a(aggregate)	Steelmkg	Permanent	24 700	2018	National Development and Reform Commission (NDRC)
CIS	Russia	Vyksa	OMK	OHF	Permanent	460	2018	Company HP, World Steel Capacities
Latin America	Brazil	Belo Horizonte, Minas Gerais	Vallourec Solucoes Tubulares do Brasil	BOF	Permanent	600	2018	Company HP. 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.

Annex C. STEELMAKING CAPACITY DATA BY ECONOMY

Table 6. Crude Steelmaking capacity developments (in mmt)

	Nominal crude steelmaking capacity					
	2008	2014	2015	2016	2017	2018
Africa	31.5	36.5	35.7	38.2	39.0	41.6
Algeria	2.4	3.6	3.6	3.6	3.6	5.9
Angola	0.0	0.0	0.5	0.5	0.5	0.5
Botswana	0.0	0.0	0.1	0.1	0.1	0.1
Cameroon	0.2	0.2	0.2	0.2	0.2	0.2
Democratic Republic of Congo	0.1	0.1	0.1	0.1	0.1	0.1
Côte d'Ivoire	0.0	0.0	0.0	0.0	0.0	0.0
Egypt	9.5	12.0	12.0	14.5	15.3	15.3
Ethiopia	0.5	0.5	0.5	0.5	0.5	0.5
Gabon	0.0	0.1	0.1	0.1	0.1	0.1
Ghana	0.4	0.4	0.4	0.4	0.4	0.4
Kenya	0.4	0.5	0.5	0.5	0.5	0.5
Libya	1.7	1.7	1.7	1.7	1.7	1.7
Mauritius	0.0	0.0	0.0	0.0	0.0	0.0
Morocco	0.8	2.8	2.8	2.8	2.8	2.8
Mozambique	0.0	0.0	0.0	0.0	0.0	0.0
Namibia	0.0	0.0	0.0	0.0	0.0	0.0
Nigeria	2.4	2.6	2.6	2.6	2.6	2.8
South Africa	12.0	10.7	9.4	9.4	9.4	9.4
Sudan	0.1	0.1	0.1	0.1	0.1	0.1
Tanzania	0.0	0.0	0.0	0.0	0.0	0.0
Togo	0.0	0.0	0.0	0.0	0.0	0.0
Tunisia	0.1	0.2	0.2	0.2	0.2	0.2
Uganda	0.1	0.1	0.1	0.1	0.1	0.1
Zambia	0.1	0.1	0.1	0.1	0.1	0.1
Zimbabwe	0.8	0.8	0.8	0.8	0.8	0.8

	Nominal crude steelmaking capacity					
	2008	2014	2015	2016	2017	2018
Asia	966.9	1554.5	1574.7	1522.6	1484.9	1473.0
Non-OECD Asia	776.9	1336.4	1356.8	1305.1	1268.8	1256.9
Bangladesh	2.5	3.7	4.6	4.6	4.6	5.1
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)	644.3	1 140.0	1 150.1	1 089.4	1 042.9	1 023.4
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	66.5	108.0	114.5	121.8	124.8	128.1
Indonesia	6.7	9.7	9.7	10.9	10.9	10.9
Japan	129.8	130.6	130.5	129.5	128.1	128.1
Korea	60.1	87.4	87.4	87.9	87.9	87.9
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	10.7	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	4.0	5.6	5.9	5.9	6.1	6.1
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	7.0	9.9	9.9	9.9	9.9	9.9
Viet Nam	4.9	10.1	12.6	13.1	20.1	20.5
ASEAN-6	30.3	42.9	45.4	47.1	54.1	58.0
CIS	139.9	141.7	141.7	142.7	142.9	142.4
Armenia	0.0	0.2	0.2	0.2	0.2	0.2
Azerbaijan	1.0	1.3	1.3	1.3	1.3	1.3
Belarus	2.8	3.0	3.0	3.0	3.0	3.0
Georgia	0.6	0.6	0.6	0.6	0.6	0.6
Kazakhstan	6.5	8.2	8.2	8.2	8.2	8.2
Moldova	1.0	1.0	1.0	1.0	1.0	1.0
Russia	77.5	83.8	83.8	84.8	85.0	84.5
Turkmenistan	0.0	0.2	0.2	0.2	0.2	0.2
Ukraine	49.5	42.5	42.5	42.5	42.5	42.5
Uzbekistan	1.0	1.0	1.0	1.0	1.0	1.0

	Nominal crude steelmaking capacity					
	2008	2014	2015	2016	2017	2018
Europe	284.6	287.1	279.1	275.6	274.0	274.0
Non-OECD Europe	14.9	13.1	13.1	13.1	13.1	13.1
EU-28	242.6	229.1	223.0	219.6	216.5	216.5
Austria	8.0	8.5	8.5	8.5	8.5	8.5
Belgium	15.1	8.6	8.6	8.9	8.9	8.9
Bulgaria	3.2	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	7.8	6.8	6.8	6.8	6.8
Denmark	0.5	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	23.5	19.6	19.6	19.6	19.1	19.1
Germany	51.4	51.7	51.9	51.9	51.9	51.9
Greece	3.7	3.7	3.7	3.7	3.7	3.7
Hungary	2.6	2.0	2.0	2.0	2.0	2.0
Ireland	0.0	0.0	0.0	0.0	0.0	0.0
Italy	35.9	37.9	37.9	37.0	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	12.1	12.1	12.1	12.1	12.1	12.1
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	5.5	4.9	4.9	4.9	4.9
Slovenia	0.7	0.7	0.7	0.7	0.7	0.7
Spain	23.0	22.4	22.4	21.7	21.7	21.7
Sweden	6.0	6.0	6.0	6.0	6.0	6.0
United Kingdom	18.7	18.7	14.1	12.1	12.1	12.1
Other Europe	42.0	58.0	56.0	56.0	57.5	57.5
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	34.1	49.4	47.4	47.4	48.9	48.9

	Nominal crude steelmaking capacity					
	2008	2014	2015	2016	2017	2018
Latin America	62.3	69.9	71.1	74.1	74.7	74.7
South America	59.6	67.1	68.3	71.3	71.9	71.9
Non OECD Latin America	60.3	68.0	69.1	72.1	72.7	72.7
Argentina	6.7	6.7	6.7	6.7	7.3	7.3
Brazil	41.2	47.6	48.3	51.3	51.3	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	1.7	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	0.3	0.9	0.9	0.9	0.9	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	0.1	0.3
Peru	1.6	1.6	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	6.1	6.2	6.2	6.2	6.2	6.2
Middle East	27.8	59.7	61.5	61.9	64.4	67.3
Non OECD Middle East	27.3	59.1	60.9	61.3	63.8	66.8
Afghanistan	0.0	0.0	0.0	0.0	0.0	0.0
Bahrain	0.0	1.0	1.0	1.0	1.0	1.0
Iran	15.0	27.0	28.2	28.2	30.7	33.6
Iraq	0.4	1.7	1.7	1.7	1.7	1.7
Israel	0.6	0.6	0.6	0.6	0.6	0.6
Jordan	0.4	1.1	1.1	1.1	1.1	1.1
Kuwait	0.2	1.4	1.4	1.4	1.4	1.4
Lebanon	0.1	0.3	0.3	0.3	0.3	0.3
Oman	0.4	3.0	3.0	3.0	3.0	3.0
Qatar	2.8	3.9	3.2	3.2	3.2	3.2
Saudi Arabia	7.4	12.5	13.7	13.7	13.7	13.7
Syrian Arab Republic	0.1	2.7	2.7	2.7	2.7	2.7
United Arab Emirates	0.5	4.4	4.4	4.8	4.8	4.8
Yemen	0.1	0.3	0.3	0.3	0.3	0.3

	Nominal crude steelmaking capacity					
	2008	2014	2015	2016	2017	2018
NAFTA	152.6	152.9	152.2	153.5	153.8	154.4
Canada	17.7	15.4	15.6	15.6	15.6	15.6
Mexico	21.5	24.0	25.2	25.6	25.6	26.2
United States	113.4	113.5	111.3	112.3	112.6	112.6
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	623.9	653.9	645.0	642.4	639.7	640.3
Non-OECD TOTAL	1 050.7	1 654.8	1 677.2	1 632.5	1 600.3	1 593.4
WORLD TOTAL	1 674.6	2 308.7	2 322.2	2 274.8	2 240.1	2 233.7

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)

Unit: mmt	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Steelmaking Capacity	1 070	1 079	1 115	1 195	1 267	1 372	1 465	1 592	1 675	1 768	1 892	1 984	2 088	2 261	2 309	2 322	2 275	2 240	2 234
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	1 809
Capacity-Production Gap	220	227	210	224	204	224	215	244	331	529	458	446	528	611	639	702	648	510	425
Crude steel production as a % of capacity	79.5%	79.0%	81.1%	81.3%	83.9%	83.7%	85.3%	84.7%	80.2%	70.1%	75.8%	77.5%	74.7%	73.0%	72.3%	69.8%	71.5%	77.2%	81.0%

Note: Capacity data reflect information up to December 2018. Annual production data for 2017 and 2018 are based on the press release of 25 January 2019 by the World Steel Association (World Steel Association, 2019[1]).Annual production data from 2008 to 2016 are from "Steel Statistical Yearbook 2018" and data from 2000 and 2007 are from "World Steel in Figures 2018", published by the World Steel Association (World Steel Association, 2018[2]) (World Steel Association, 2018[85]).
Source: OECD for capacity and World Steel Association for production.

Annex E. WORKING DEFINITION USED

Steelmaking capacity

The OECD Secretariat employs a definition of nominal crude steelmaking capacity based on maximum theoretical equipment capacity.[29] 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

The three databases described in this paper are used to assess capacity developments. 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 forecast, 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] OECD capacity data and reports that the Committee agreed to its declassification are available on the OECD Steelmaking Capacity portal at (oe.cd/steelcapacity).

[2] The new estimate for capacity in 2017 and 2018 is based on information made available up to December 2018 and reflects comments and modifications from OECD Steel Committee delegates after discussion on a draft of this report at the Steel Committee meeting in March 2019.

[3] According to "World Steel Capacities Database" (compiled by Metal Expert) on 11 January 2019, the commissioning date is expected to be in Q1 2019 (Metal Expert, 2019[33]).

[4] According to Danieli's publication "DANIELI YEAR 2018", page 75, the capacity of SMC's new EAF is described as 0.25 mmt (Danieli, 2018[9]).

[5] Shougang Jingtang has completed its first stage and started the operation of BOF facilities with a capacity of 9.7 mmt of steelmaking in 2009. Shougang Jingtang has started construction of the expansion project in August 2015 (Shougang Group, n.d.[87]).

[6] Baosteel Zhanjiang Iron and Steel has started full operation of BOF facilities with a capacity of around 9.0 mmt in 2016 (Baosteel, 2016[108]).

[7] According to Mr. Shen Wenrong, the chairman of Shagang Group, following the closures of outdated induction furnaces in 2017, many steelmakers have started to build EAF facilities in replacement and these might come on stream in 2018 (wallstreetcn, 2018[109]).

[8] According to NMDC's annual report 2016-2017, page 33-34, the commissioning of new steel plant would be in March 2019, with a description of "NMDC will put its all efforts to roll the first steel products by March 2019" (NMDC, 2016-2017[89]).

[9] 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.

[10] Despite the name, Vietnam-Japan Steel (Vija) has no investment from Japan. Vija was established in November 1998 under the Law of Domestic Investment of Viet Nam (Vietnam-Japan Steel, n.d.[90]) (Platts, 2016[91]).

[11] According to "World Steel Capacities Database" on 11 January 2019, the project status of 2.0 mmt BOF is described as "underway" and scheduled for commissioning in 2019, while another 2.0 mmt BOF is described as "plan", and which is planned for commissioning in 2019 (Metal Expert, 2019[33]).

[12] According to the report by Metal Expert on 26 November 2018, the commissioning of steelmaking facilities of Tulachermet Steel is expected in the first half of 2019 (Metal Expert, 2018[92]).

[13] According to "World Steel Capacities Database" on 11 January 2019, the capacity of closed OHF facilities is described as 0.46 mmt (Metal Expert, 2019[33]).

[14] Additional information including current steelmaking capacity are available at the website of Zaporizhstal Iron and Steel Works (Zaporizhstal Iron and Steel Works, n.d.[104]).

[15] India's JSW group signed an agreement to acquire Aferpi from the former owner Cevital of Algeria in May 2018 (Ministry of Economic Development of Italy, 2018[94]).

[16] Aferpi closed its BOF facilities at the Piombino works in 2017, which had a capacity of 2.9 mmt (OECD, 2018[112]).

[17] According to the report by Metal Expert on 15 January 2019, the project of a new steel mill has been indefinitely suspended due to debts to the contractor (Metal Expert, 2019[110]).

[18] According to a report by Platts on 28 March 2018, the Iranian Steel Producers' Association noted that about $27.4 billion in new investment – by domestic or foreign sources – is required to achieve the national target of 55 mmt of steelmaking capacity by 2025 (Platts, 2018[105]).

[19] According to a report by Platts on 16 July 2013, MCC would support construction of seven EAF mills in Iran with a capacity of 0.8 mmt respectively (a total of 5.6 mmt of capacity) (Platts, 2013[106]).

[20] According to Big River Steel's announcement, the expansion of EAF capacity in the Arkansas mill would be up to around 3.0 mmt (increase by around 1.5 mmt). The construction was expected to have started later in 2018 and continue for approximately two years (Big River Steel, 2018[95]) (SMS Group, n.d.[96]).

[21] Steel Dynamics has a plan to install a new EAF with a capacity of around 2.7 mmt. The location of the plant is expected to be in the south-western region of the United States and the construction would begin in 2020, followed by the start of operations during the second half of 2021 (Steel Dynamics, 2018[97]).

[22] Australia's BlueScope Steel has started a comprehensive study to examine the expansion of steelmaking capacity through installing new EAF in its subsidiary North Star in Delta, Ohio, the United States. The capacity additions would be from 0.6 to 0.9 mmt and an update of the study is to be provided in 2019 (BlueScope Steel, 2018[98]).

[23] Please see Section 3. for details on the cross-border and JV investments, which have newly been announced in 2018 or already underway, including have started operation in 2018. The details on other investments which have been announced before are available at the footnote from 24 to 28, as well as Annex A.

[24] Hebei Xinwuan Steel Group and Metallurgical Corporation of China (MCC) has a plan of construction of new 5.0 mmt integrated steel mill in Sarawak State, Malaysia (MCC, 2016[100]).

[25] These project 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) (Formosa Ha Tinh Steel Corporation, n.d.[111]). According to Steel Plantech (the steel engineering company, which had supplied 7.0 mmt BOF facilities to FHS commissioned in 2017), FHS plans to expand steelmaking capacity to 10 mmt, and eventually expand to be more than 20 mmt (Steel Plantech, 2012[101]).

[26] According to an interview report by Metal Expert on 12 November 2018, Mr. Chen Yuan-Cheng, Chairman of FHS, said that "The future plans, such as the third blast furnace, will depend on the production, market conditions and government support. These factors will define when the actual investment will take place. But the location and layout for the expansion have been reserved" (Metal Expert, 2018[102]).

[27] India's JSW Steel has a plan to install a new EAF facility in its mill of Baytown, Texas, the United States, but no further details about this project, including the schedule and steelmaking capacity, has been disclosed yet (Tenova, 2018[99]).

[28] PT Krakatau POSCO (the investors are Krakatau Steel, and Indonesian company, and POSCO, a Korean company) has a plan of expanding steelmaking capacity by 3.0 mmt in the near future. Fildzah Fikrotuzzakiah of PT Krakatau POSCO presented on "2017 SEAISI Conference & Exhibition", May 2017 (PT Krakatau POSCO, 2017[103]).

[29] This definition is also commonly referred to as nominal, rated or nameplate capacity.