Sustainability indicators
2020 report

Indicator trends and participation
2003-2019
# Sustainability indicators
## 2003 to 2019

### Environmental Performance

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CO2 intensity (tonnes CO2/tonne crude steel cast)</td>
<td>1.80</td>
<td>1.79</td>
<td>1.81</td>
<td>1.80</td>
<td>1.76</td>
<td>1.75</td>
<td>1.82</td>
<td>1.80</td>
<td>1.87</td>
<td>1.87</td>
<td>1.84</td>
<td>1.81</td>
<td>1.83</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Material efficiency (% of solid materials converted to products &amp; co-products)</td>
<td>96.09</td>
<td>96.78</td>
<td>96.96</td>
<td>96.49</td>
<td>97.94</td>
<td>98.03</td>
<td>97.94</td>
<td>97.48</td>
<td>96.11</td>
<td>96.48</td>
<td>98.00</td>
<td>97.47</td>
<td>97.36</td>
<td>96.92</td>
<td>96.49</td>
<td>96.33</td>
</tr>
<tr>
<td>4</td>
<td>Environmental Management System (EMS) (% of employees &amp; contractors working in EMS-registered production facilities)</td>
<td>90.92</td>
<td>92.40</td>
<td>82.69</td>
<td>84.78</td>
<td>85.07</td>
<td>86.62</td>
<td>88.89</td>
<td>87.60</td>
<td>89.33</td>
<td>89.53</td>
<td>90.18</td>
<td>94.05</td>
<td>93.59</td>
<td>96.89</td>
<td>96.55</td>
<td>97.08</td>
</tr>
</tbody>
</table>

### Social Performance

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Lost-time injury frequency rate (injuries/million hours worked)</td>
<td>4.81</td>
<td>4.15</td>
<td>4.55</td>
<td>4.44</td>
<td>3.09</td>
<td>2.46</td>
<td>2.29</td>
<td>1.91</td>
<td>1.45</td>
<td>1.60</td>
<td>1.39</td>
<td>1.17</td>
<td>1.01</td>
<td>0.97</td>
<td>0.84</td>
<td>0.83</td>
</tr>
<tr>
<td>6</td>
<td>Employee training (training days/employee)</td>
<td>7.46</td>
<td>11.62</td>
<td>12.28</td>
<td>10.52</td>
<td>11.10</td>
<td>8.02</td>
<td>8.47</td>
<td>6.95</td>
<td>7.74</td>
<td>7.88</td>
<td>7.80</td>
<td>6.27</td>
<td>6.75</td>
<td>6.94</td>
<td>6.26</td>
<td>6.36</td>
</tr>
</tbody>
</table>

### Economic Performance

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Investment in new processes and products (% of revenue)</td>
<td>6.37</td>
<td>6.96</td>
<td>6.91</td>
<td>7.90</td>
<td>7.76</td>
<td>8.24</td>
<td>10.22</td>
<td>8.80</td>
<td>8.28</td>
<td>10.05</td>
<td>8.53</td>
<td>7.32</td>
<td>8.22</td>
<td>7.70</td>
<td>5.76</td>
<td>6.10</td>
</tr>
<tr>
<td>8</td>
<td>Economic Value Distributed (% of revenue)</td>
<td>78.18</td>
<td>78.30</td>
<td>90.52</td>
<td>93.46</td>
<td>95.65</td>
<td>99.77</td>
<td>96.83</td>
<td>96.31</td>
<td>100.09</td>
<td>97.48</td>
<td>95.36</td>
<td>93.84</td>
<td>98.02</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**
- Indicators 1 and 2: CO2 intensity and Energy intensity are calculated using route-specific energy and CO2 intensity for the basic oxygen furnace and electric arc furnace. The indicators are also weighted based on the production share of each route. Data prior to 2007 is not available.
- Indicator 5: Lost time injury frequency rate includes fatalities and is calculated based on figures including contractors and employees. Data prior to 2004 is not available.
- Indicator 6: Employee training includes production and non-production facilities.
- Indicator 7: Investment in new processes and products includes capital expenditure and R&D investment.
- Indicator 8: Data collection for EVD started in 2007.
Number of reporting companies
2003 to 2019

Table 1: Number of reporting organisation for Indicators 1 through 4

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>CO2 intensity</td>
<td>47</td>
<td>53</td>
<td>52</td>
<td>52</td>
<td>51</td>
<td>51</td>
<td>50</td>
<td>53</td>
<td>52</td>
<td>58</td>
<td>58</td>
<td>60</td>
<td>55</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Energy intensity</td>
<td>47</td>
<td>53</td>
<td>52</td>
<td>52</td>
<td>51</td>
<td>51</td>
<td>50</td>
<td>53</td>
<td>52</td>
<td>58</td>
<td>58</td>
<td>60</td>
<td>55</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mat. efficiency</td>
<td>18</td>
<td>23</td>
<td>24</td>
<td>28</td>
<td>27</td>
<td>27</td>
<td>36</td>
<td>38</td>
<td>40</td>
<td>44</td>
<td>38</td>
<td>41</td>
<td>33</td>
<td>37</td>
<td>42</td>
<td></td>
</tr>
<tr>
<td>EMS</td>
<td>17</td>
<td>30</td>
<td>27</td>
<td>31</td>
<td>24</td>
<td>25</td>
<td>35</td>
<td>41</td>
<td>43</td>
<td>44</td>
<td>39</td>
<td>41</td>
<td>50</td>
<td>56</td>
<td>42</td>
<td>47</td>
</tr>
</tbody>
</table>

Table 2: Number of reporting organisations for Indicators 5 and 6

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>LTIFR</td>
<td>35</td>
<td>33</td>
<td>36</td>
<td>44</td>
<td>41</td>
<td>64</td>
<td>90</td>
<td>92</td>
<td>89</td>
<td>74</td>
<td>77</td>
<td>79</td>
<td>82</td>
<td>78</td>
<td>75</td>
<td>66</td>
<td></td>
</tr>
<tr>
<td>Training</td>
<td>18</td>
<td>29</td>
<td>27</td>
<td>30</td>
<td>24</td>
<td>26</td>
<td>33</td>
<td>38</td>
<td>39</td>
<td>38</td>
<td>37</td>
<td>45</td>
<td>38</td>
<td>33</td>
<td>40</td>
<td>42</td>
<td></td>
</tr>
</tbody>
</table>

Table 3: Number of reporting organisations for Indicators 7 and 8

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Investments*</td>
<td>23</td>
<td>30</td>
<td>30</td>
<td>34</td>
<td>31</td>
<td>32</td>
<td>38</td>
<td>41</td>
<td>42</td>
<td>41</td>
<td>42</td>
<td>59</td>
<td>72</td>
<td>66</td>
<td>60</td>
<td>60</td>
<td>61</td>
</tr>
<tr>
<td>EVD**</td>
<td>24</td>
<td>25</td>
<td>36</td>
<td>41</td>
<td>42</td>
<td>43</td>
<td>41</td>
<td>60</td>
<td>76</td>
<td>65</td>
<td>59</td>
<td>59</td>
<td>62</td>
<td>60</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Investment in new processes and products
**Data collection for EVD started in 2007
Number of reporting companies
2003 to 2020

87 steel companies and associations listed below contributed data for one or more of the 2019 indicators.

1. Acciaierie Bertoli Safau S.p.A.
2. ACERINOX S.A.
3. Aichi Steel Corporation
4. AK Steel Corporation
5. Altos Hornos de México, S.A.B. de C.V. (AHMSA)
6. Ansteel Group Corporation Limited
7. Aperam
8. Asociación Latinomericana del Acero (Alacero)
9. AZA
10. Badische Stahlwerke GmbH
11. Big River Steel
12. BlueScope Steel Limited
14. British Steel Limited
15. CELSA Group
16. China Baowu Group
17. China Steel Corporation
18. CITIC PACIFIC Special Steel Group Co., Ltd
19. Cogne Acciai Speciali Spa
20. Çolakoğlu Metalurji A.Ş.
21. Companhia Siderúrgica Nacional (CSN)
22. Daido Steel Co., Ltd.
23. DEACERO, SAPI de C.V.
24. Deutsche Edelstahlwerke GmbH (DEW)
25. Dongkuk Steel Mill Co., Ltd
26. Dragon steel corporation
27. El Marakby for Metallic Industries
28. Emirates Steel Industries Company PJC
29. Eregli Demir ve Çelik Fabrikaları TAS (Eregli Iron and Steel Works, Co.)
30. Essar Steel Ltd.
31. EVRAZ
32. EZZ Steel
33. FENG HSN STEEL CO., LTD.
34. Georgsmarienhütte Holding GmbH
35. Gerdaú S.A.
36. HBIS Group Co., Ltd.
37. HYUNDAI BNG STEEL Company Ltd.
38. HYUNDAI Steel Company
39. IMIDRO
40. JFE Steel Corporation
41. Jindal Steel and Power Limited (JSPL)
42. JSW Steel Limited
43. Kobe Steel, Ltd
44. Kromam Çelik Sanayii A.Ş.
45. Liberty Steel Australia
46. Magnitogorsk Iron and Steel Works (PJSC)
47. Metalloinvest Management Company LLC
48. Metinvest Holding LLC
49. NatSteel Holdings Pte Ltd
50. Nippon Kinzoku Co., Ltd.
51. Nippon Steel Corporation
52. Nippon Steel Stainless Steel Corporation (NSSSC)
53. Nippon Yakin Kogyo Co., Ltd.
54. North American Stainless
55. Novolipetsk Steel (NLMK Group)
56. Nucor Corporation
57. Outokumpu Oyj
58. Ovako AB
59. POSCO
60. POSCO-Thainox Public Company Limited
61. Qatar Steel Company (Q.P.S.C.)
62. Rashtriya Ispat Nigam Ltd (VIZAG Steel)
63. SABIC-Saudi Basic Industries Corporation (HADEED)
64. Sahaviriya Steel Industries Public Company Limited (SSI)
65. SeAH Changwon Integrated Special Steel Corp.
66. Severstal (PAO)
67. Siam Yamato Steel, Thailand
68. SIDENOR S.A.
69. SIJ (Slovenian Steel Group)
70. SSAB AB
71. Stahlbeteiligungen Holding S.A. (Riva Group)
72. Steel Authority of India Ltd. (SAIL)
73. Tang Eng Iron Works Co. Ltd
74. Tata Steel Europe
75. Tata Steel Limited
76. Techint Group (Tenaris)
77. Ternium
78. The Japan Iron and Steel Federation (JISF)
79. thyssenkrupp AG
80. TMK (PAO)
81. TŘINECKÉ ŽELEZÁRNY, a.s
82. Tung Ho Steel Enterprise Corporation
83. UGITECH SA
84. United States Steel Corporation
85. Usinas Siderúrgicas de Minas Gerais S.A. (USIMINAS)
86. Vallourec
87. voestalpine AG

Publicly available data was used for the 17 companies below:

1. Anyang Steel
2. ArcelorMittal
3. Baotou Iron & Steel (Group) Co., Ltd
4. Benxi Steel
5. Fangda Steel
6. Jixi Steel
7. Jiuquan Steel
8. Lingyuan Steel
9. Liuzhou Steel
10. Nanjing Steel
11. Nanming Steel
12. Shagang Group
13. Shandong Steel
14. Shougang Group
15. Taiyuan Steel
16. Valin Group
17. Xinyu Steel
### Environmental performance

<table>
<thead>
<tr>
<th>INDICATOR</th>
<th>DEFINITION</th>
<th>RELEVANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. CO 2 emissions</td>
<td>This indicator calculates tonnes of CO&lt;sub&gt;2&lt;/sub&gt; emissions normalized against production (tonnes of crude steel cast). The calculation is based on route-specific energy and CO&lt;sub&gt;2&lt;/sub&gt; intensities for 2 steel production routes: 1) basic oxygen furnace 2) electric arc furnace This indicator is weighted based on the production share of each route.</td>
<td>Reducing GHG emissions in steelmaking must be tackled on a global level. Making the substantial CO&lt;sub&gt;2&lt;/sub&gt; reductions required will need technology transfer, collaboration and breakthrough technologies. Steel products also play an important role in a low carbon economy due to their long life cycle, 100% recyclability, and innovative qualities.</td>
</tr>
<tr>
<td>2. Energy intensity</td>
<td>This indicator measures the energy consumed normalized against production (tonnes of crude steel cast). The calculation is based on route-specific energy and CO&lt;sub&gt;2&lt;/sub&gt; intensities for 2 steel production routes: 1) basic oxygen furnace 2) electric arc furnace This indicator is weighted based on the production share of each route.</td>
<td>Steel production is energy-intensive. The steel industry has made significant reductions in energy consumption in the past decades resulting in benefits to the environment while ensuring economic competitiveness.</td>
</tr>
<tr>
<td>3. Material efficiency</td>
<td>This indicator measures the percentage of raw materials used on-site to make crude steel converted to products and co-products. The industry’s goal is zero waste.</td>
<td>The recovery and use of co-products within and outside the steel industry combined with the responsible management of natural resources contribute to material efficiency and help to prevent waste.</td>
</tr>
<tr>
<td>4. Environmental management system (EMS)</td>
<td>This indicator measures the percentage of employees and contractors who work in a production facility that has been certified to a recognised international EMS standard such as ISO 14001*, or EMAS**.</td>
<td>Registered environmental management systems are an effective way to manage environmental performance and to ensure legal compliance.</td>
</tr>
</tbody>
</table>
### Social performance

<table>
<thead>
<tr>
<th>INDICATOR</th>
<th>DEFINITION</th>
<th>RELEVANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. Lost time injury frequency rate (LTIFR)</td>
<td>A Lost Time Injury (LTI) is an incident that causes an injury that prevents the person from returning to his next scheduled shift or work period. Lost Time Injury Frequency Rate (LTIFR) is the number of Lost Time Injuries per million man-hours. LTIFR includes fatalities.</td>
<td>Our industry employs millions of people. Nothing is more important than the safety and health of the people who work in the steel industry.</td>
</tr>
<tr>
<td>6. Employee training</td>
<td>This indicator measures the total days of training per employee. The result of the calculation is the average number of training days per employee and year. Training may include various types of development programmes such as classroom instruction, computer-based training, self-study and learning or on-the-job instruction. Employee training does not focus on safety and health, but may include it.</td>
<td>Human capital is a key asset for all organisations and a main driver for the creation of value. Training programmes aim to expand the knowledge and skills of employees and help them to make the best use of their talents.</td>
</tr>
</tbody>
</table>
### Economic performance

<table>
<thead>
<tr>
<th>INDICATOR</th>
<th>DEFINITION</th>
<th>RELEVANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>7. Investment in new processes and products</td>
<td>This indicator measures the value of investments made on capital expenditure, and research and development expressed as a percentage of revenue. Capital expenditure refers to money used to acquire or improve long-term physical assets such as property, plants, machinery and equipment, industrial buildings and warehouses. Research and development refers to money used with the prospect of gaining new scientific or technical knowledge to develop new products, processes, and services. The result is presented as percentage of annual revenue.</td>
<td>Investments in new processes and R&amp;D contribute to a sustainable steel industry.</td>
</tr>
</tbody>
</table>
| 8. Economic value distributed (EVD) | This indicator aims to quantify the value distributed to society by the steel industry. It includes direct and indirect contributions, regardless of the country’s financial structure (e.g. all contributions are captured - whether made directly from the company to the community or indirectly from the company through government taxes, shareholder dividends or employee wages, etc.). It is a sum of:  
- Operating costs (payments to suppliers, contractors, etc.)  
- Employee wages and benefits (gross values, including employee tax paid)  
- Dividends paid to all shareholders (including non-controlling interest)  
- Interest payments made to providers of loans  
- Payments to government (gross taxes and royalties, not including employee tax paid)  
- Community investments (voluntary contributions and investments of funds in the broader community, including donations and scholarships, etc.). | Steel is critical to economic growth. It is important to quantify the value companies create and to establish how much of this wealth is distributed to society. |

The result is presented as billion US$ and US$ as a percentage of total revenue.
World Steel Association

Avenue de Tervueren 270
1150 Brussels
Belgium

T: +32 (0) 2 702 89 00
F: +32 (0) 2 702 88 99
E: steel@worldsteel.org

C413 Office Building
Beijing Lufthansa Center
50 Liangmaqiao Road
Chaoyang District
Beijing 100125
China

T: +86 10 6464 6733
F: +86 10 6468 0728
E: china@worldsteel.org

worldsteel.org