Environmental Load Through the Value Chain

Calculation of GHG Emissions Throughout the Value Chain

We calculate greenhouse gas (GHG) emissions throughout the entire value chain in conformance with GHG Protocol standards to more effectively reduce these emissions. As a substantial amount of emissions comes from use of the products we sell, we make an ongoing effort to reduce emissions by enhancing the efficiency and energy-saving features of our products and services during their use.

**Environmental Data**

**Scope 1** Direct emissions from in-house fuel use and industrial processes
- 1.87 Mt-CO2e (1.3%)

**Scope 2** Indirect emissions from production of electricity and heat purchased by the company
- 2.60 Mt-CO2e (1.9%)

**Scope 3** Other indirect emissions not covered by Scope 1 and 2
- 11.54 Mt-CO2e (8.2%)

**Total GHG Emissions**
- 141.49 Mt-CO2e

**Scope 3** Downstream
- Other indirect emissions not covered by Scope 1 and 2
  - (Emissions by other entities related to the company’s activities)
  - 125.48 Mt-CO2e (88.6%)

**Scope 3** Upstream
- Other indirect emissions not covered by Scope 1 and 2
  - (Emissions by other entities related to the company’s activities)
  - 11.54 Mt-CO2e (8.2%)

In-house: Within the scope of the company’s organizational boundaries. In principle, the scope of all business activities of the company itself and activities within or controlled by its consolidated subsidiaries.

Upstream: In principle, activities related to purchased products and services.

Downstream: In principle, activities related to sold products and services.
### GHG Emissions Throughout the Hitachi Value Chain (Hitachi Group)

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
<th>Calculation Results (Mt-CO₂e)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Scope 1</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Direct emissions</td>
<td>Direct emissions from in-house fuel use and industrial processes</td>
<td>1.87 (1.3%)</td>
</tr>
<tr>
<td><strong>Scope 2</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Energy-related indirect emissions</td>
<td>Indirect emissions from production of electricity and heat purchased by the company</td>
<td>2.60 (1.9%)</td>
</tr>
<tr>
<td><strong>Scope 3:</strong> Upstream (other indirect emissions)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Purchased goods and services</td>
<td>Emissions from the resource extraction stage to the manufacturing stage, including raw materials, parts, supplied products, and sales</td>
<td>9.51 (6.8%)</td>
</tr>
<tr>
<td>Capital goods</td>
<td>Emissions generated in the construction, manufacture, and shipping of the company’s own capital goods, such as equipment, devices, buildings, facilities, and vehicles</td>
<td>1.45 (1.0%)</td>
</tr>
<tr>
<td>Fuel- and energy-related activities not included in Scope 1 and 2</td>
<td>Emissions from procuring fuel necessary for electricity and other energy production, including resource extraction, production, and shipping</td>
<td>0.24 (0.2%)</td>
</tr>
<tr>
<td>Upstream transportation and distribution</td>
<td>Emissions from distribution of raw materials, parts, supplied products, and sales prior to delivery of materials to the company, as well as other distribution activities of products for which the company bears the expense</td>
<td>0.10 (0.1%)</td>
</tr>
<tr>
<td>Waste generated in operations</td>
<td>Emissions from transportation, disposal, and treatment of waste generated in the company’s operations</td>
<td>0.11 (0.1%)</td>
</tr>
<tr>
<td>Business travel</td>
<td>Emissions generated from fuel and electric power used by employees for business travel</td>
<td>0.07 (0.0%)</td>
</tr>
<tr>
<td>Employee commuting</td>
<td>Emissions generated from fuel and electric power used in employee commuting</td>
<td>0.06 (0.0%)</td>
</tr>
<tr>
<td>Upstream leased assets</td>
<td>Emissions from the operation of assets leased by the company, excluding those counted in Scope 1 and 2</td>
<td>Included in Scope 1 and 2</td>
</tr>
<tr>
<td><strong>Scope 3:</strong> Downstream (other indirect emissions)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Downstream transportation and distribution</td>
<td>Emissions from transportation, storage, loading and unloading, and retail sales of products</td>
<td>0.01 (0.0%)</td>
</tr>
<tr>
<td>Processing of sold products</td>
<td>Emissions by downstream companies during processing of intermediate products</td>
<td>N/A**</td>
</tr>
<tr>
<td>Use of solid products***</td>
<td>Emissions from use of products by end users, such as consumers and businesses</td>
<td>125.05 (88.3%)</td>
</tr>
<tr>
<td>End-of-life treatment of solid products**</td>
<td>Emissions from transportation, waste disposal, and treatment of products by end users, such as consumers and businesses</td>
<td>0.31 (0.3%)</td>
</tr>
<tr>
<td>Downstream leased assets</td>
<td>Emissions from operating assets owned by the reporting company as lessor and leased to other entities</td>
<td>0.03 (0.0%)</td>
</tr>
<tr>
<td>Franchises</td>
<td>Emissions by franchises under Scope 1 and 2</td>
<td>N/A</td>
</tr>
<tr>
<td>Investments</td>
<td>Emissions related to management of investments</td>
<td>0.08 (0.0%)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>141.49 (100%)</td>
</tr>
</tbody>
</table>

Note: Figures in parentheses are percentages of GHGs emitted throughout the value chain.

*1 Includes SF₆, PFC, HFC, N₂O, NF₃, and CH₄. The gas and fuel conversion factor is based on the list of emissions and calculation methods published by Japan’s Ministry of the Environment.


*3 Cannot be determined due to insufficient information on processing.

*4 CO₂ emissions per unit is based on the Inventory Database for Environmental Analysis (IDEA), developed by the National Institute of Advanced Industrial Science and Technology (AIST) and the Japan Environmental Management Association for Industry (JEMAI).
Environmental Load from Operations

Data on Environmental Load from Operations (Hitachi Group, FY 2018)

The data below shows the resource inputs and the environmental load for Hitachi Group operations in fiscal 2018.

**INPUT**

**Total Energy Input (crude oil equivalent)**

2.27 GL

**Raw Materials Input**

4,403 kt

**Total Water Input**

37.02 million m³

**OUTPUT**

**Greenhouse Gas Emissions**

4,523 kt-CO₂e

**Total Volume of Waste and Valuables**

1,384 kt

**Total Volume of Water Effluents Discharged**

34.10 million m³

*1 CO₂e: CO₂ equivalent.
## Detailed Data on Resource Input and Environmental Load Output

### Total Input of Resources

Total resources input from Hitachi Group operations.

#### Total Energy Input

<table>
<thead>
<tr>
<th></th>
<th>FY 2017</th>
<th>FY 2018</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Renewable energy</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electricity</td>
<td>3.1 GWh (11.2 TJ)</td>
<td>7.1 GWh (25.6 TJ)</td>
</tr>
<tr>
<td><strong>Non-renewable energy</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electricity</td>
<td>6,020 GWh (21.7 PJ)</td>
<td>6,021 GWh (21.7 PJ)</td>
</tr>
<tr>
<td></td>
<td>For heating</td>
<td>120 GWh (0.5 PJ)</td>
</tr>
<tr>
<td></td>
<td>For cooling</td>
<td>277 GWh (1.0 PJ)</td>
</tr>
<tr>
<td></td>
<td>To generate steam</td>
<td>644 GWh (2.4 PJ)</td>
</tr>
<tr>
<td>Gas</td>
<td>0.19 Gm³ (0.6 PJ)</td>
<td>0.18 Gm³ (0.6 PJ)</td>
</tr>
<tr>
<td></td>
<td>For heating</td>
<td>18.4 Mm³ (0.8 PJ)</td>
</tr>
<tr>
<td></td>
<td>For cooling</td>
<td>10.3 Mm³ (0.5 PJ)</td>
</tr>
<tr>
<td></td>
<td>To generate steam</td>
<td>560 kt (1.3 PJ)</td>
</tr>
<tr>
<td>LPG, LNG, etc.</td>
<td>269 kt (14.5 PJ)</td>
<td>251 kt (13.5 PJ)</td>
</tr>
<tr>
<td>Fuel oil (heavy oil, kerosene, etc.)</td>
<td>117 ML (4.5 PJ)</td>
<td>87 ML (3.4 PJ)</td>
</tr>
<tr>
<td>Solid fuel (coke)</td>
<td>179 kt (6.3 PJ)</td>
<td>189 kt (5.5 PJ)</td>
</tr>
</tbody>
</table>

#### Raw Materials Input

<table>
<thead>
<tr>
<th></th>
<th>FY 2017</th>
<th>FY 2018</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Materials</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metals</td>
<td>3,388 kt</td>
<td>4,031 kt</td>
</tr>
<tr>
<td>New materials</td>
<td>1,571 kt</td>
<td>1,624 kt</td>
</tr>
<tr>
<td>Recycled materials, etc.</td>
<td>1,817 kt</td>
<td>2,407 kt</td>
</tr>
<tr>
<td>Plastics</td>
<td>151 kt</td>
<td>165 kt</td>
</tr>
<tr>
<td>New materials</td>
<td>120 kt</td>
<td>163 kt</td>
</tr>
<tr>
<td>Recycled materials, etc.</td>
<td>1 kt</td>
<td>2 kt</td>
</tr>
<tr>
<td>Other materials</td>
<td>258 kt</td>
<td>207 kt</td>
</tr>
<tr>
<td>New materials</td>
<td>250 kt</td>
<td>201 kt</td>
</tr>
<tr>
<td>Recycled materials, etc.</td>
<td>8 kt</td>
<td>6 kt</td>
</tr>
<tr>
<td><strong>Chemicals</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PRTR substances*1 handled</td>
<td>205 kt</td>
<td>189 kt</td>
</tr>
<tr>
<td>Ozone-depleting substances handled</td>
<td>77 t</td>
<td>130 t</td>
</tr>
<tr>
<td>Greenhouse gas substances handled</td>
<td>5,656 t</td>
<td>5,640 t</td>
</tr>
</tbody>
</table>

*1 PRTR substances: The 462 chemicals designated in Japan’s Pollutant Release and Transfer Register (PRTR) Law.
## Total Water Input

<table>
<thead>
<tr>
<th>Water provided by municipality or other sources</th>
<th>FY 2017</th>
<th>FY 2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tap water</td>
<td>7.40 m³</td>
<td>7.61 m³</td>
</tr>
<tr>
<td>Industrial water, river water</td>
<td>17.46 m³</td>
<td>16.63 m³</td>
</tr>
<tr>
<td>Groundwater</td>
<td>13.96 m³</td>
<td>12.74 m³</td>
</tr>
<tr>
<td>Rain water</td>
<td>0.02 m³</td>
<td>0.01 m³</td>
</tr>
<tr>
<td>Recycled water (recycled from the wastewater of other organizations)</td>
<td>0.10 m³</td>
<td>0.03 m³</td>
</tr>
</tbody>
</table>

Water use: 37.02 million m³
## Total Output of Environmental Load
Environmental load output from Hitachi Group operations.

### Greenhouse Gas Emissions

<table>
<thead>
<tr>
<th></th>
<th>FY 2017</th>
<th>FY 2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO₂ emissions</td>
<td>4,663 kt-CO₂</td>
<td>4,470 kt-CO₂</td>
</tr>
<tr>
<td>Other GHGs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SF₆ (sulfur hexafluoride)</td>
<td>40 kt-CO₂e</td>
<td>35 kt-CO₂e</td>
</tr>
<tr>
<td>PFCs (perfluorocarbons)</td>
<td>4 kt-CO₂e</td>
<td>5 kt-CO₂e</td>
</tr>
<tr>
<td>HFCs (hydrofluorocarbons)</td>
<td>7 kt-CO₂e</td>
<td>3 kt-CO₂e</td>
</tr>
<tr>
<td>N₂O, NF₃, CH₄ (dinitrogen monoxide, nitrogen trifluoride, methane)</td>
<td>1 kt-CO₂e</td>
<td>3 kt-CO₂e</td>
</tr>
<tr>
<td>CO₂ from non-energy sources</td>
<td>3 kt-CO₂</td>
<td>7 kt-CO₂</td>
</tr>
</tbody>
</table>

**Notes:**
- The gas and fuel oil conversion factor is based on the list of emissions and calculation methods published by Japan’s Ministry of the Environment.

### Total Volume of Waste and Valuables

<table>
<thead>
<tr>
<th></th>
<th>FY 2017</th>
<th>FY 2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waste and valuables generation</td>
<td>1,384 kt</td>
<td>Nonhazardous: 1,348 kt (hazardous*: 36 kt)</td>
</tr>
<tr>
<td>Waste reduction</td>
<td>83 kt (9.0)</td>
<td>94 kt (5.6)</td>
</tr>
<tr>
<td>Recycling</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reuse</td>
<td>1 kt (0.4)</td>
<td>1 kt (0.0)</td>
</tr>
<tr>
<td>Materials recycled</td>
<td>1,038 kt (20.2)</td>
<td>1,044 kt (25.6)</td>
</tr>
<tr>
<td>Thermal recovery</td>
<td>11 kt (1.4)</td>
<td>13 kt (1.4)</td>
</tr>
<tr>
<td>Landfill</td>
<td>223 kt (5.2)</td>
<td>232 kt (3.7)</td>
</tr>
<tr>
<td>Chemicals</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PRTR substances discharged or transferred</td>
<td>4.2 kt</td>
<td>4.1 kt</td>
</tr>
<tr>
<td>SOₓ (sulfur oxides)</td>
<td>107 kNm³**</td>
<td>96 kNm³**</td>
</tr>
<tr>
<td>NOₓ (nitrogen oxides)</td>
<td>469 kNm³</td>
<td>452 kNm³</td>
</tr>
<tr>
<td>Ozone-depleting substances emitted (CFC-11, etc.)</td>
<td>1 t (0.1-ODP**²)</td>
<td>1 t (0.01-ODP**²)</td>
</tr>
</tbody>
</table>

*1 Waste materials that pose a threat to human health or the living environment. We dispose of all such materials in accordance with the laws and regulations of each country and region.
*2 Includes SOₓ generated by a materials company that became a consolidated member of the Hitachi Group in fiscal 2016.
*3 ODP (ozone depletion potential): A coefficient indicating the extent to which a chemical compound may cause ozone depletion relative to the depletion for CFC-11 (trichlorofluoromethane, ODP = 1.0). The emissions factor uses the ODP and global warming potential of Japan’s Ministry of the Environment.

### Total Volume of Water Effluents Discharged

<table>
<thead>
<tr>
<th></th>
<th>FY 2017</th>
<th>FY 2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public water</td>
<td>23.12 million m³</td>
<td>22.44 million m³</td>
</tr>
<tr>
<td>Sewerage</td>
<td>8.62 million m³</td>
<td>8.18 million m³</td>
</tr>
<tr>
<td>Underground infiltration, evaporation, etc.</td>
<td>3.39 million m³</td>
<td>3.48 million m³</td>
</tr>
<tr>
<td>Water quality</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BOD (biological oxygen demand)</td>
<td>392 t</td>
<td>390 t</td>
</tr>
<tr>
<td>COD (chemical oxygen demand)</td>
<td>617 t</td>
<td>1,701 t</td>
</tr>
</tbody>
</table>
Environmental Accounting

Hitachi discloses environmental accounting data based on a set of environmental accounting procedures conforming to the Japanese Ministry of the Environment's Environmental Accounting Guidelines. We use the environmental accounting data to raise the efficiency of our environmental investments and activities, more effectively allocating management resources to our ongoing environmental efforts.

Achievements

Environmental Investments, Environmental Protection Costs, and Economic Effects (Hitachi Group)

<table>
<thead>
<tr>
<th>Year</th>
<th>Environmental Investments</th>
<th>Environmental Protection Costs</th>
<th>Economic Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>4.5</td>
<td>15.2</td>
<td>112.0</td>
</tr>
<tr>
<td>2015</td>
<td>7.5</td>
<td>7.5</td>
<td>107.6</td>
</tr>
<tr>
<td>2016</td>
<td>14.1</td>
<td>12.7</td>
<td>89.5</td>
</tr>
<tr>
<td>2017</td>
<td>11.0</td>
<td>21.4</td>
<td>92.5</td>
</tr>
<tr>
<td>2018</td>
<td>9.9</td>
<td>9.9</td>
<td>94.2</td>
</tr>
</tbody>
</table>

Fiscal 2018 Environmental Investments by Countermeasure (Hitachi Group)

- Climate change response: 71%
- Pollution prevention: 25%
- Waste reduction: 3%
- Other: 1%
Environmental Investments

(billions of yen)

<table>
<thead>
<tr>
<th>Description</th>
<th>FY 2014</th>
<th>FY 2015</th>
<th>FY 2016</th>
<th>FY 2017</th>
<th>FY 2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total investment: Investment in energy-saving equipment and equipment that directly reduces environmental load</td>
<td>4.46</td>
<td>7.50</td>
<td>5.12</td>
<td>10.99</td>
<td>9.86</td>
</tr>
</tbody>
</table>

Environmental Protection Costs

(billions of yen)

<table>
<thead>
<tr>
<th>Item</th>
<th>FY 2014</th>
<th>FY 2015</th>
<th>FY 2016</th>
<th>FY 2017</th>
<th>FY 2018</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total</strong></td>
<td>111.97</td>
<td>107.59</td>
<td>89.50</td>
<td>92.46</td>
<td>94.16</td>
</tr>
</tbody>
</table>

Environmental Protection Effects

• Economic Effects*1

(billions of yen)

<table>
<thead>
<tr>
<th>Item</th>
<th>FY 2014</th>
<th>FY 2015</th>
<th>FY 2016</th>
<th>FY 2017</th>
<th>FY 2018</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total</strong></td>
<td>15.19</td>
<td>14.05</td>
<td>12.73</td>
<td>21.44</td>
<td>16.55</td>
</tr>
</tbody>
</table>

• Physical Effects*1

(million kWh)

<table>
<thead>
<tr>
<th>Item</th>
<th>FY 2014</th>
<th>FY 2015</th>
<th>FY 2016</th>
<th>FY 2017</th>
<th>FY 2018</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total</strong></td>
<td>68</td>
<td>69</td>
<td>51</td>
<td>41</td>
<td>55</td>
</tr>
</tbody>
</table>

Environmental Liability

We have appropriated 7.2 billion yen in expenses for the disposal of PCB-containing waste and 1.5 billion yen to clean up contaminated soil as the amounts that we can reasonably project as of March 2019 as future environmental liabilities.