Nitto
Innovation for Customers

Environmental Data Book 2019

Material flow

Environment Index				Value	Unit
Inputs	Raw materials	Other than organic solvent(resin film, chemicals etc.)(non-consolidated)		156,432	ton
		★Organic solvents purchased		56,882	ton
	Energies	★Electricity purchased		766,993	MWh
		★Green electricity purchased		33,785	MWh
		★Solar electricity generated		1,371	MWh
		★Steam purchased		6,560	ton
		★Diesel oil / A-type heavy oil purchased		3,044	kL
		★LPG purchased		2,202	ton
		★Natural gas purchased		1,856,399	GJ
		★LNG purchased		44,557	ton
		★Gasoline and kerosene purchased		13,738	GJ
	Water withdrawal	★Municipal supply water/ Industrial water		3,738,573	m^3
		★Ground water		3,097,296	m^3
Outputs	Atmospheric release	★Organic solvents		1,391	ton
		★CO_2		812,810	ton
	Waste etc.	★Amount disposed		127,294	ton
		Disposal	★Amount recycled	94,500	ton
			Final disposal amount(landfill or incineration without energy recovery)	32,794	ton
	Water discharged	★Amount discharged		5,665,596	m^3
		Discharge to	Public water areas	3,750,702	m^3
			Sewage lines	1,882,970	m^3
			Others	31,924	m^3
		★Pollutants(COD) to public water areas		12.8	ton
Others		★Organic solvent recycled		16,598	ton
		★Water recycled		825,969	m^3
		Water consumed		1,170,273	m^3

Environmental efficiency(to sales)

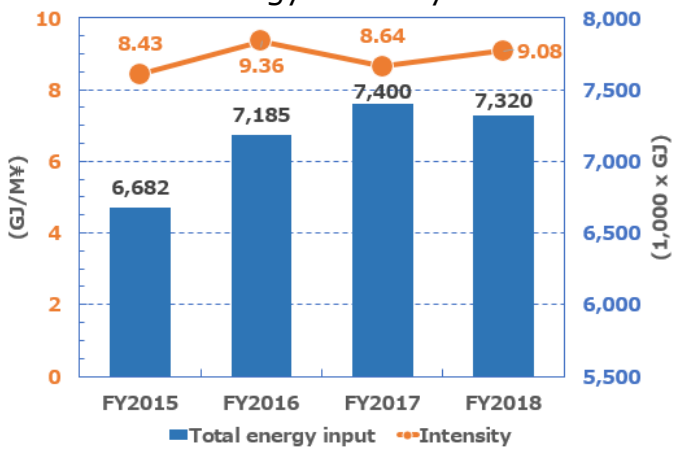
Energy intensity

	Unit	FY2015	FY2016	FY2017	FY2018
Total energy input	GJ	6,681,554	7,185,038	7,399,849	7,319,699★
Sales	M¥	793,054	767,710	856,262	806,495
Intensity	GJ/M¥	8.43	9.36	8.64	9.08

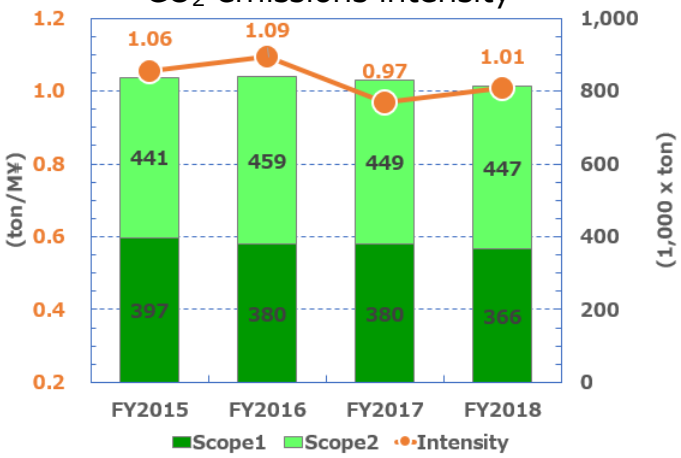
CO_2 emissions intensity

	Unit	FY2015	FY2016	FY2017	FY2018
CO_2 emissions(Scope1)	ton	397,144	380,150	380,422	366,163★
CO_2 emissions(Scope2)	ton	440,750	459,090	449,446	446,647★
CO_2 emissions(Total)	ton	837,894	839,240	829,868	812,810
Sales	M¥	793,054	767,710	856,262	806,495
Intensity	ton/M¥	1.06	1.09	0.97	1.01

Energy intensity



CO_2 emissions intensity



Change in environment indexes

□**Total energy input** Unit: GJ

	FY2015	FY2016	FY2017	FY2018
Japan	4,218,336	4,384,177	4,551,713	4,560,461
The Americas	377,032	486,766	527,447	499,658
Europe	353,345	443,864	456,242	363,274
Asia and Oceania	1,732,841	1,870,231	1,864,447	1,896,307
Total	6,681,554	7,185,038	7,399,849	7,319,699★

□**CO_2 emissions(Scope1: Direct emissions)** Unit: ton

	FY2015	FY2016	FY2017	FY2018
Japan	265,958	252,119	250,736	236,390
The Americas	16,659	18,071	19,022	17,771
Europe	37,905	41,131	43,196	40,578
Asia and Oceania	76,622	68,829	67,468	71,424
Total	397,144	380,150	380,422	366,163★

□**CO_2 emissions(Scope2: Energy indirect emissions)** Unit: ton

	FY2015	FY2016	FY2017	FY2018
Japan	255,604	265,949	262,029	259,082
The Americas	20,771	24,224	25,649	25,675
Europe	7,014	7,455	7,278	4,214
Asia and Oceania	157,361	161,462	154,490	157,676
Total	440,750	459,090	449,446	446,647★

□**CO_2 emissions(Scope3: Other indirect emissions)(non-consolidated)** Unit: ton

	FY2017	FY2018
Purchased goods and services★	396,698	389,128
Capital goods	57,791	85,852
Fuel-and-energy-related activities(not included in Scope1 or 2)★	44,380	44,447
Upstream transportation and distribution	9,789	8,809
Waste generated in operations★	36,103	34,548
Business travel	790	801
Employee commuting	2,515	2,554
Upstream leased assets	-	-
Downstream transportation and distribution	-	-
Processing of sold products	-	-
Use of sold products	-	-
End of life treatment of sold products★	74,536	71,579
Downstream leased assets	-	-
Franchises	-	-
Investments	-	-
Total	622,602	637,717

□**Water withdrawal** Unit: m^3

	FY2015	FY2016	FY2017	FY2018
Japan	4,171,581	4,140,776	4,445,897	4,576,444
The Americas	719,810	666,324	643,168	537,586
Europe	88,057	82,641	78,488	93,226
Asia and Oceania	1,966,708	1,818,916	1,791,713	1,628,613
Total	6,946,156	6,708,657	6,959,266	6,835,869★

□**Pollutants(COD) to public water areas** Unit: ton

	FY2015	FY2016	FY2017	FY2018
Japan	11.4	9.3	9.3*	9.7
The Americas	0	0	0	0
Europe	0	0	0	0
Asia and Oceania	2.0	2.1	2.4	3.1
Total	13.4	11.4	11.7*	12.8★

*Values in FY2017 were revised to raise their accuracy.

□**Total waste etc. disposed** Unit: ton

	FY2015	FY2016	FY2017	FY2018
Japan	73,365	69,518	68,214	67,258
The Americas	8,370	11,423	9,468	10,103
Europe	10,426	10,902	9,789	9,530
Asia and Oceania	57,893	51,905	40,955	40,403
Total	150,054	143,748	128,426	127,294★

□**Percentage of waste etc. recycled** Unit: %

	FY2015	FY2016	FY2017	FY2018
Japan	93	98	98	99
The Americas	17	20	24	17
Europe	56	97	97	97
Asia and Oceania	28	41	50	42
Total	61	71	77	74★

□**Hazardous waste disposed** Unit: ton

	FY2015	FY2016	FY2017	FY2018
Japan	6,248	10,071	9,416	8,297
The Americas	495	2,033	1,186	1,092
Europe	654	597	620	697
Asia and Oceania	30,055	23,823	15,184	14,637
Total	37,452	36,524	26,406	24,722★

□**Atmospheric release of PRTR substances(non-consolidated)** Unit: ton

	FY2015	FY2016	FY2017	FY2018★
Toluene	585.7	590.3	276.9	250.1
Xylene*	9.0	5.1	0.9	0.9
N-hexane	11.5	10.1	8.7	8.6
Butyl acrylate	3.1	0.3	0.3	0.3
2-hydroxyethyl acrylate	0.1	0.0	0.0	0.0

*Atmospheric release of xylene in FY2017 was revised to raise its accuracy.

□**Atmospheric release of NOx and SOx(non-consolidated)** Unit: ton

	FY2016	FY2017	FY2018★
NOx	206.2	224.8	161.0
SOx	3.8	0.2	0.3

□**Others** Unit: Yen in Millions

	FY2015*2	FY2016	FY2017	FY2018
Environmental Equipment Investment*1	1,492	2,872	3,384	3,596

*1 Calculated in approval basis.

*2 Value in FY2015 were revised to raise its accuracy.

*) Due to rounding, sum of values by country or region may not equal total value.

Environmental Data Calculation Standards

To enhance the reliability of its disclosed information, Nitto Group has such information assured by a third-party organization. In this Environmental Data Book 2019, environmental performance indicators marked with ★ have been assured accordingly.

1. Period and Organizations Covered by Environmental Data

FY	Period	Organizations Covered (No. of companies)	Organizations Covered (% of production unit)
2018	April 2018 to March 2019	38	95%

2. Calculation methods

2-1. Energy, CO_2, NOx and SOx related

Data	Calculation method
Total Energy Input Unit: GJ	Total Energy Input = Electricity purchased, and electricity generated x Heat value per unit Heat value per unit is based on " Act on Rationalizing Energy Use enforcement regulations ".
Electricity purchased Unit: MWh	Total amount of purchased electricity from third parties
Green electricity purchased Unit: MWh	Total amount of purchased green electricity from third parties
Solar electricity generated Unit: MWh	Total amount of solar electricity generated by Nitto Gr.
Steam purchased Unit: ton	Total amount of purchased steam from third parties
Diesel oil / A-type heavy oil purchased Unit: kL	Total amount of purchased Diesel oil, gas oil and A-type heavy oil (Japan) from third party
LPG purchased Unit: ton	Total amount of purchased Liquefied petroleum gas from third parties
Natural gas purchased Unit: GJ	Total amount of purchased natural gas from third parties
LNG purchased Unit: ton	Total amount of purchased Liquefied natural gas from third parties
Gasoline and kerosene purchased Unit: GJ	Total amount of purchased gasoline & kerosene from third parties

<table>
<tr><td>CO_2 emissions
Scope1:Direct emissions
Scope2:Energy indirect emissions
Unit: ton</td><td>The calculation method is based on “A Corporate Accounting and Reporting Standard Revised Edition” issued by The Greenhouse Gas Protocol.

Emission coefficient
a) Energy(fuel, steam):
Coefficient stipulated in ”Act on Promotion of Global Warming Countermeasures”
b) Energy(electric power):
Emission coefficient by electric suppliers or individual region’s coefficient provided by GHG Protocol, Purchased Electricity Tool ver.4.8(GWP 2014 IPCC 5th Assessment Report)
c)Materials burned by Nitto Gr. (solvent):
Coefficient decided by Nitto assuming combustion reaction of solvent
d) Materials burned by Nitto Gr. (waste):
Coefficient stipulated in ”Act on Promotion of Global Warming Countermeasures”</td></tr>
<tr><td>CO_2 emissions
Scope3:Other indirect emissions
Unit: ton</td><td>The calculation method is based on The Basic Guidelines on Accounting for Greenhouse Gas Emissions throughout the Supply Chain ver.2.3 (Ministry of the Environment and Ministry of Economy, Trade and Industry in Japan).
Emission coefficients are based on the following database:
a) the Emissions per Unit Database for the Purpose of Calculating the Greenhouse Gas and other Emissions of Organizations throughout the supply Chain ver.2.6
b) JEMAI CFP Program Basic Database ver. 1.01
c) JEMAI CFP Program Available Database ver. 1.04
<table>
<tr><td>1</td><td>Purchased goods and services</td><td>Σ{Weight of purchased material by type x CO_2 emissions per unit}</td></tr>
<tr><td>2</td><td>Capital goods</td><td>Equipment investment amount x CO_2 emissions per unit</td></tr>
<tr><td>3</td><td>Fuel-and energy-related activities</td><td>Σ{Amount of purchased energy by type x CO_2 emissions per unit}</td></tr>
<tr><td>4</td><td>Upstream transportation and distribution</td><td>Based on the Act on the Rationalizing Energy Use</td></tr>
<tr><td>5</td><td>Waste generated in operations</td><td>Σ{Amount of waste discharged by type x CO_2 emissions per unit}</td></tr>
<tr><td>6</td><td>Business travel</td><td>Number of employees x CO_2 emissions per unit</td></tr>
<tr><td>7</td><td>Employee commuting</td><td>Σ{Number of employees by site x Number of employees x Annual operating days}</td></tr>
<tr><td>8</td><td>Upstream leased assets</td><td>Included in Scope1 & 2</td></tr>
<tr><td>9</td><td>Downstream transportation and distribution</td><td>Included in “Upstream transportation and distribution”</td></tr>
</table>
</td></tr>
</table>

	10	Processing of sold products	Not calculated (because our products are intermediate materials and it is difficult to recognize processes of our customers.)
	11	Use of sold products	Not calculated (because our products are intermediate materials and it is difficult to recognize processes of our customer.)
	12	End-of-life treatment of sold products	Shipped weight (plastic product) x CO_2 emissions per unit
	13	Downstream leased asset	N/A (no leased asset)
	14	Franchises	N/A (no franchises)
	15	Investments	N/A (We are not investors or financial providers.)
NOx atmospheric emissions Unit: ton	NOx atmospheric emissions = Concentration of nitrogen oxides contained in exhaust gas x Amount of exhaust gas		
SOx atmospheric emissions Unit: ton	SOx atmospheric emissions = Concentration of sulfur oxides contained in exhaust gas x Amount of exhaust gas		

2-2. Water-related*2

Data	Calculation method
Water withdrawal Unit: m3	Sum of municipal supply water, industrial water and ground water.
Municipal supply water/ Industrial water Unit: m3	Total amount of water of quality that can be used for household use, and water of quality not suitable for household use purchased from outside the Nitto Gr.
Ground water Unit: m3	Total amount of ground water pumped by Nitto Gr.
Water recycled Unit: m3	Total amount of rainwater stored for reuse and recycled water within the Nitto Gr. *1 Results of Nitto Denko Corp. Onomichi and Kameyama Plants.
Water discharged Unit: m3	Total amount of water discharged to public water areas, sewage lines and the others from Nitto Gr. Some sites, which do not measure amount of water discharged, regard amount of water withdrawal as amount of water discharged.
Pollutants (COD) /COD Discharged Unit: ton	Pollutants(COD) = Concentration of chemical oxygen demand (COD) contained in water discharged x Amount water discharged This data covers only sites which must measure COD according to local rules.
Water consumed Unit:m3	Deduct amount of water discharged from water withdrawal

*2 Nitto Denko Avecia Inc., Nitto Denko (Foshan) Co., Ltd. and Matex Kakoh Corporation are excluded for this water related data.

2-3. Organic solvents-related

Data	Calculation method
Amount purchased Unit: ton	Total amount of purchased organic solvents (see below) from third parties: Toluene, Ethyl acetate, Cactus solvent, Dimethylformamide, Isopropyl alcohol, Hexane *Until FY2017 it partially included purchased organic solvents other than the above ones, but from FY2018 it was limited to the above ones.
Amount recycled Unit: ton	Total amount of refined organic solvents for the purpose of reuse by Nitto Gr.
Atmospheric release of organic solvents Unit: ton	Atmospheric release of organic solvents (see below) = Σ{Concentration of organic solvent by type x Amount of exhaust gas}. Some sites use estimated figures calculated from purchased solvents. Toluene, Ethyl acetate, Cactus solvent, Dimethylformamide, Isopropyl alcohol, Hexane *Until FY2017 it was partially included organic solvents other than the above ones, but from FY2018 it was limited to the above ones.

2-4. Waste-related

Data	Calculation method
Amount disposed / Total waste etc. disposed Unit: ton	Total amount of waste (including hazardous waste) and valuable resources that are treated by external experts' service.
Amount recycled Unit: ton	Amount recycled = Total amount of waste which is recycled, reused or incinerated for energy recovery + Total amount of valuable resources
Percentage of waste etc. recycled Unit: %	Percentage of waste etc. recycled = Amount recycled ÷ Total waste etc. disposed
Hazardous waste disposed Unit: ton	Total amount of hazardous waste regulated by each country and is treated by external experts' service.

2-5. PRTR-related

Data	Calculation method
Atmospheric release Unit: ton	Calculation method of each substance is based on Law concerning Pollutant Release and Transfer Register (PRTR) in Japan.

Third-Party Assurance

KPMG

Independent Assurance Report

To President, CEO & COO of Nitto Denko Corporation

We were engaged by Nitto Denko Corporation (the "Company") to undertake a limited assurance engagement of the environmental performance indicators marked with ★ (the "Indicators") for the period from April 1, 2018 to March 31, 2019 included in its Environmental Data Book 2019 (the "Data Book") for the fiscal year ended March 31, 2019.

The Company's Responsibility

The Company is responsible for the preparation of the Indicators in accordance with its own reporting criteria (the "Company's reporting criteria"), as described in the Data Book.

Our Responsibility

Our responsibility is to express a limited assurance conclusion on the Indicators based on the procedures we have performed. We conducted our engagement in accordance with the 'International Standard on Assurance Engagements (ISAE) 3000, Assurance Engagements other than Audits or Reviews of Historical Financial Information' and the 'ISAE 3410, Assurance Engagements on Greenhouse Gas Statements' issued by the International Auditing and Assurance Standards Board. The limited assurance engagement consisted of making inquiries, primarily of persons responsible for the preparation of information presented in the Data Book, and applying analytical and other procedures, and the procedures performed vary in nature from, and are less in extent than for, a reasonable assurance engagement. The level of assurance provided is thus not as high as that provided by a reasonable assurance engagement. Our assurance procedures included:

- Interviewing the Company's responsible personnel to obtain an understanding of its policy for preparing the Data Book and reviewing the Company's reporting criteria.
- Inquiring about the design of the systems and methods used to collect and process the Indicators.
- Performing analytical procedures on the Indicators.
- Examining, on a test basis, evidence supporting the generation, aggregation and reporting of the Indicators in conformity with the Company's reporting criteria, and recalculating the Indicators.
- Visiting two of the Company's factories selected on the basis of a risk analysis.
- Evaluating the overall presentation of the Indicators.

Conclusion

Based on the procedures performed, as described above, nothing has come to our attention that causes us to believe that the Indicators in the Data Book are not prepared, in all material respects, in accordance with the Company's reporting criteria as described in the Data Book.

Our Independence and Quality Control

We have complied with the Code of Ethics for Professional Accountants issued by the International Ethics Standards Board for Accountants, which includes independence and other requirements founded on fundamental principles of integrity, objectivity, professional competence and due care, confidentiality and professional behavior. In accordance with International Standard on Quality Control 1, we maintain a comprehensive system of quality control including documented policies and procedures regarding compliance with ethical requirements, professional standards and applicable legal and regulatory requirements.

KPMG AZSA Sustainability Co., Ltd.

KPMG AZSA Sustainability Co., Ltd.
Osaka, Japan
June 24, 2019