

Reference Material #2-1. Supply and Use Table for Environmental Protection Services (1990)

Nominal								In ¥1 billion
		Government service providers	Industry	Professional service providers	Non-professional service providers		Total	Related products
				Waste treatment services provided (by the industry sector)	Secondary activity Recycling industry	Ancillary activity Internal environmental protection activities		
		1	2	3	4	5	6	7
Supply table								
Intermediate consumption	1	717.7	1,518.3	334.6	1,183.7	632.6	551.1	2,236.0
Consumption of fixed capital	2	533.6	207.2	92.5	114.7	53.2	61.5	740.8
Product tax	3	13.4	71.5	33.2	38.3	38.3	-	84.9
(less) Production subsidy	4	-	-2.5	-1.1	-1.4	-1.4	0.0	-2.5
Compensation of employees	5	900.6	1,228.7	961.6	267.0	173.5	93.5	2,129.3
Net operating surplus	6	-	248.0	170.3	77.7	77.7	-	248.0
Production subtotal	7	2,165.2	3,271.2	1,591.1	1,680.1	973.9	706.2	5,436.4
Import	8	0.3	191.7		191.7	191.7		192.1
Total supply at basic price	9	2,165.5	3,462.9	1,591.1	1,871.8	1,165.6	706.2	5,628.5
Transport and commercial margins	10							
Total supply at purchasers' price	11	2,165.5	3,462.9	1,591.1	1,871.8	1,165.6	706.2	5,628.5
Use table								
Intermediate consumption	12	459.5	3,264.1	1,403.9	1,860.2	1,154.0	706.2	3,723.7
Government service providers	13	2.1						2.1
Professional service providers	14	2.4						2.4
Non-professional service providers (secondary)	15		1,403.9	1,403.9			706.2	1,403.9
Non-professional service providers (other)	16	455.0			1,154.0	1,154.0		455.0
Government final consumption	17	1,347.8						1,347.8
Household final consumption	18	357.0	188.0	188.0				545.0
Gross capital formation	19							0.0
Export	20	0.6	13.3	0.3	13.0	13.0		13.8
Use total	21	2,165.0	3,465.4	1,592.2	1,873.2	1,167.0	706.2	5,630.4
Discrepancy (supply-use)	22	0.6	-2.5	-1.1	-1.4	-1.4	0.0	-1.9
Additional information								
Gross fixed capital formation	23	3,342.7	322.0	29.3	292.7	431.6	292.7	3,664.7
Fixed capital stock	24	33,578.8	2,346.2	213.3	2,132.9		2,132.9	35,925.0

Reference Materials #2-2. Supply and Use Table for Environmental Protection Services (1995)

Nominal

In ¥1 billion

		Government service providers	Industry				Total	Related products	
			Professional service providers	Non-professional service providers					
				Waste treatment services provided (by the industry sector)	Secondary activity	Ancillary activity			
		Sewerage and waste treatment services (at publicly owned facilities)	Recycling industry		Internal environmental protection activities				
		1	2	3	4	5	6	7	8
Supply table									
Intermediate consumption	1	985.2	1,492.5	588.1	904.4	408.7	495.7	2,477.7	
Consumption of fixed capital	2	869.5	203.7	104.5	99.2	38.9	60.4	1,073.2	
Product tax	3	17.1	142.2	113.6	28.6	28.6	-	159.3	
(less) Production subsidy	4	-	-8.6	-0.4	-8.2	-0.9	-7.3	-8.6	
Compensation of employees	5	1,009.4	1,069.8	840.3	229.5	130.6	98.9	2,079.3	
Net operating surplus	6	-	268.3	225.4	42.9	42.9	-	268.3	
Production subtotal	7	2,881.2	3,168.0	1,871.6	1,296.4	648.8	647.7	6,049.2	107.0
Import	8	0.1	131.5		131.5	131.5		131.6	
Total supply at basic price	9	2,881.3	3,299.5	1,871.6	1,427.9	780.3	647.7	6,180.8	107.0
Transport and commercial margins	10								
Total supply at purchasers' price	11	2,881.3	3,299.5	1,871.6	1,427.9	780.3	647.7	6,180.8	107.0
Use table									
Intermediate consumption	12	651.6	3,076.8	1,661.0	1,415.8	768.1	647.7	3,728.4	
Government service providers	13	4.0						4.0	
Professional service providers	14	8.0						8.0	
Non-professional service providers (secondary)	15		1,661.0	1,661.0			647.7	1,661.0	
Non-professional service providers (other)	16	639.6			768.1	768.1		639.6	
Government final consumption	17	1,629.6						1,629.6	
Household final consumption	18	598.7	210.5	210.5				809.2	
Gross capital formation	19							0.0	
Export	20	0.5	13.5	0.4	13.1	13.1		14.0	
Use total	21	2,880.4	3,300.8	1,871.9	1,428.8	781.2	647.7	6,181.2	107.0
Discrepancy (supply-use)	22	0.8	-1.3	-0.4	-0.9	-0.9	0.0	-0.4	0.0
Additional information									
Gross fixed capital formation	23	5,654.8	450.8	41.0	409.8	333.9	409.8	6,105.6	
Fixed capital stock	24	44,479.3	2,018.0	183.5	1,834.6		1,834.6	46,497.3	

Reference Materials #2-3. Supply and Use Table for Environmental Protection Services (2000)

Nominal

In ¥1 billion

		Government service providers	Industry				Total	Related products	
				Professional service providers	Non-professional service providers				
		Sewerage and waste treatment services (at publicly owned facilities)	Waste treatment services provided (by the industry sector)	Secondary activity Recycling industry	Ancillary activity Internal environmental protection activities				
1		2	3	4	5	6	7	8	
Supply table									
Intermediate consumption	1	1,147.6	1,940.6	634.9	1,305.8	880.9	424.9	3,088.3	
Consumption of fixed capital	2	205.6	274.0	138.0	136.0	84.2	51.8	479.6	
Product tax	3	36.3	287.3	213.4	74.0	74.0	-	323.7	
(less) Production subsidy	4	-	-1.4	1.3	-2.7	-2.7	0.0	-1.4	
Compensation of employees	5	1,023.5	1,374.4	1,013.3	361.1	276.3	84.8	2,397.9	
Net operating surplus	6	-	197.8	111.7	86.1	86.1	-	197.8	
Production subtotal	7	2,413.1	4,072.7	2,112.5	1,960.2	1,398.8	561.4	6,485.8	0.0
Import	8	0.1	162.9		162.9	162.9		163.0	
Total supply at basic price	9	2,413.2	4,235.7	2,112.5	2,123.1	1,561.7	561.4	6,648.8	0.0
Transport and commercial margins	10								
Total supply at purchasers' price	11	2,413.2	4,235.7	2,112.5	2,123.1	1,561.7	561.4	6,648.8	0.0
Use table									
Intermediate consumption	12	870.9	3,928.0	1,854.8	2,073.2	1,511.8	561.4	4,798.9	
Government service providers	13	4.8						4.8	
Professional service providers	14	11.5						11.5	
Non-professional service providers (secondary)	15		1,854.8	1,854.8			561.4	1,854.8	
Non-professional service providers (other)	16	854.6			1,511.8	1,511.8		854.6	
Government final consumption	17	785.2						785.2	
Household final consumption	18	755.4	253.4	253.4				1,008.8	
Gross capital formation	19							0.0	
Export	20	0.7	52.9	0.3	52.6	52.6		53.6	
Use total	21	2,412.1	4,234.4	2,108.5	2,125.8	1,564.4	561.4	6,646.5	0.0
Discrepancy (supply-use)	22	1.0	1.3	4.0	-2.7	-2.7	0.0	2.3	0.0
Additional information									
Gross fixed capital formation	23	5,167.5	246.7	22.4	224.3	33.8	224.3	5,414.2	
Fixed capital stock	24	55,791.1	1,836.1	166.9	1,669.2		1,669.2	57,627.3	

Attachment 3. Data for "Hybrid Accounting System integrating Environmental Pressures and Economic Activities"

Name			Data description		Unit	
National Accounting Matrix: Monetary value						
Items other than environmental protective assets			“Annual Report on National Accounts of 2004” (calendar year, nominal basis), Input-Output Table, etc.		Monetary value (¥1 billion)	
Environmental protective assets			Environmental protection asset data in Japan’s SEEA (sources: “Japan’s Social Capital” edited by Director General of Cabinet Office, “Survey on Antipollution Capital Investments” by METI and other documents.) • Man-made assets owned by the industry and government sectors as environmental protection assets (Columns 26 and 27) • Forests in the cultivated asset category (Column 31)		Monetary value (¥1 billion)	
Environmental accounts: Quantity basis						
Pollutants	Air-related	Global warming	CO ₂	“GIO Greenhouse Gas Inventory Database,” Greenhouse Gas Inventory Office of Japan (GIO), Center for Global Environmental Research, National Institute for Environmental Studies	1,000 tonnes (CO ₂ equivalent)	
			N ₂ O	N ₂ O emission in the above-mentioned database	1,000 tonnes (N ₂ O actual weight)	
			CH ₄	CH ₄ emission in the above-mentioned database	1,000 tonnes (CH ₄ actual weight)	
			HFCs	Hydrofluorocarbons (HFCs) emission in the above-mentioned database	1,000 tonnes (CO ₂ equivalent)	
			PFCs	Perfluorocarbons (PFCs) emission in the above-mentioned database	1,000 tonnes (CO ₂ equivalent)	
			SF ₆	SF ₆ emission in the above-mentioned database	1,000 tonnes (CO ₂ equivalent)	
		Ozone depletion	CFC	Not included. ★ Data on shipment, production and consumption volumes are available on Environment Ministry, “Annual Report on Monitoring Ozone Layer,” but data on emission volume are not available.		
			Acidification	NO _x	“UNFCCC” Green Gas Emission Database	1,000 tonnes (NO ₂ equivalent)
				SO ₂	SO ₂ emission in the said document	1,000 tonnes (SO ₂ actual weight)
		NH ₃		Not included ★ Emission volume data is not available. ¹⁾		
		Water	T-P		T-P data in the “DPO to Water” section of “The Weight of Nations” (Material Outflows from Industrial Economies, World Resources Institute, 2000)	1,000 tonnes (T-P equivalent)
			T-N		T-N data in the said document	1,000 tonnes (T-N equivalent)
	Wastewater (COD)		Organic load (as COD) in the said document	1,000 tonnes (COD equivalent)		
	Waste	Total emission, recycled volume and final disposal volume		Nonindustrial waste: Ministry of Environment, “Waste Treatment in Japan.” Industrial waste: Data on final disposal volume in Ministry of Environment, “Survey on Generation/Disposal of Industrial Wastes.” (The former Ministry of Welfare used to publish both of these two publications.)	10,000 tonnes → 1,000 tonnes	
	Natural resources	Energy	Gas	Gaseous energy resources including natural gas and LNG (liquefied natural gas). Production volume and consumption volume: Agency for Natural Resources and Energy and the Institute of Energy Economics, Japan, “General Energy Statistics” (energy balance table). Reserves: Agency for Natural Resources and Energy and the Institute of Energy Economics, Japan, “General Energy Statistics” (Reference section: Original data comes from Oil & Gas Journal.).	Production and consumption: PJ (1,000 trillion J, or sometimes 1 million m ³) Reserves: bcf (billion cubic feet)→PJ	
Crude oil			Liquid energy resources including crude oil and NGL (natural gas liquid) Production volume and consumption volume: Same as gas. Reserves: Same as gas.	Production and consumption: PJ (1,000 trillion J, or sometimes 1 million m ³) Reserves: 1 bbl→PJ		
Coal			Solid energy resources including fuel coal, coking coal and anthracite coal Production volume and consumption volume: Same as gas. Reserves: Agency for Natural Resources and Energy and the Institute of Energy Economics, Japan, “General Energy Statistics” (Reference section: Original data comes from BP statistics.).	Production and consumption: PJ (1,000 trillion J, or sometimes 1,000 tonnes) Reserves: 1 million tonnes →PJ		

	Forest	Forest	Deforestation: Forestry Agency, "Timber Demand-Supply Table." Forest growth data: Forestry Agency, "Statistics on National Forests" (and data calculated on the private forests). Demand/supply volume: Forestry Agency, "Timber Demand-Supply Table."	1,000 m ³
	Water	Water use	Water use data (on the water-intake basis) from Ministry of Land, Infrastructure and Transport, "Water Resources in Japan." Water use data include agricultural water, industrial water and domestic noncommercial water.	100 million m ³ → 1 million m ³
	Fishery	Marine products	Data on domestic production, import, export, and edible/inedible fishery products bound for domestic market from Ministry of Land, Infrastructure and Transport, "Food Demand-Supply Table." This section covers fish and shellfish (Fishery products also include seaweeds and whales.)	1,000 tonnes (on the pre-processing weight basis)
Land use (land use purpose category)	Agricultural land	Agricultural land data from the "Land space by National land use category" section of the former National Land Agency, "National Land Statistics Handbook" and from the "National Land Use" section of Ministry of Land, Infrastructure and Transport, "White Paper on Land."		10,000 ha→ 1,000 ha
	Forest and wildland	Forest and wildland in the said documents.		10,000 ha→ 1,000 ha
	River and waterway	Data on rivers and waterways in the said documents.		10,000 ha→ 1,000 ha
	Road	Road data in the said documents.		10,000 ha→ 1,000 ha
	Residential area space	Residential space data in the said documents		10,000 ha→ 1,000 ha
	Other land	"Others" in the said documents		10,000 ha→ 1,000 ha
Hidden material flows		Ministry of Environment, "Environmental Statistics Handbook of 2002" and Japan's hidden flow data in the material balance (at home and abroad).		100 million tonnes → 1 million tonnes
Environmental accounts: Environmental problems				
Global warming		GWP data from "Study Results on Calculating Greenhouse Effect Gas Emission" (Supporting material #5, List of Global Warming Coefficients stipulated in Article 4 of the enforcement order), prepared by Study Group on How to Calculate Greenhouse Effect Gas Emission, the former Environment Agency, September 2000. Applicable substances: CO ₂ , CH ₄ , N ₂ O, HFCs, PFCs and SF ₆ .		GWP (Global warming potential)
Ozone depletion		ODP data from Annexes A to E of "The Montreal Protocol on Substances that Deplete the Ozone Layer." (Source: "Annual Report on Monitoring Ozone Layer") Applicable substances: CFC, HCFC, etc.		ODP (Ozone depletion potential)
Acidification		AEQ data from "Life cycle assessment"(An operational guide to the ISO standards, Final report, May 2001)		AEQ (acidification equivalent)
Eutrophication		EEQ conversion coefficient from the said publication		EEQ (eutrophication equivalent)
Decrease in natural resources	Energy resources	Calorie data from "General Energy Statistics"		PJ (1,000 trillion J)
	Forest resources	— ²⁾		1,000 m ³
	Water resource	—		1 million m ³
	Fishery resources	—		1,000 tonnes
Land use (by land use purpose category)		—		1,000 ha
Hidden material flows		—		1 million tonnes

Notes: 1) Sources of NH₃ include living organism (livestock, etc.), burning, chemical fertilizer inputs as well as industrial process for manufacturing NH₃ and fertilizers, but data on emission amount is not available.

2) In the "environmental accounts," the symbol "—" means that data in the corresponding substances account are usable without making adjustments.

Reference Material #4. Breakdown of Air Substances by Sector

(1) Global warming substance (CO₂)

		Global warming		
		CO ₂		
		In 1,000 tonnes (CO ₂)		
		1990	1995	2000
A. Production activities	00	959,805	1,015,987	1,017,274
Industry sector	01	933,500	983,479	979,517
Agriculture, forestry and fishery	02	33,452	33,898	29,791
Mining	03	1,801	2,303	1,997
Manufacturing	04	374,779	386,717	388,469
Foods	05	8,203	7,928	9,170
Textile	06	9,520	10,032	10,392
Paper and pulp	07	25,227	28,992	28,678
Chemical	08	145,411	145,343	60,178
Petroleum and coal products	09	10,435	12,306	14,661
Ceramic, stone and clay products	10	98,302	102,666	89,288
Primary metals	11	152,909	146,250	146,231
Iron and steel	12	147,528	142,067	143,362
Nonferrous metals	13	5,381	4,183	2,869
Metal and machinery	14	48,901	32,539	8,289
Other manufacturing	15	32,636	29,569	40,524
Overlapping correction	16	(156,764)	(128,907)	(18,941)
Construction	17	15,478	16,608	11,109
Electricity, gas and water supply	18	341,904	356,335	366,330
Wholesale and retail	19	15,313	17,268	17,086
Financial and insurance	20	5,553	6,429	7,169
Real estate	21	9,047	10,533	12,565
Transport and communication	22	113,273	129,175	115,178
Service	23	22,898	24,213	29,823
Government service providers	24	24,642	30,482	35,536
Private non-profit-based service providers to households	25	1,663	2,025	2,221
B. Final consumption	00	162,312	194,921	221,424
Government actual final consumption (aggregate)	01	0	0	0
Domestic household actual final consumption	02	162,312	194,921	221,424
C. Emissions due to leakage in the production process and other factors	00	1	1	1
Leakage in the production process	01	1	1	1
Other	02	0	0	0
D. Flows from foreign nations (ROW)	00	-	-	-
E. Flows to foreign nations (ROW)	00	-	-	-
F. Total emission	00	1,122,117	1,210,908	1,238,699

(2) Acidification substances (NO_x, SO₂)

		Acidification			
		NO _x		SO ₂	
		1,000 tonnes (NO _x)		1,000 tonnes (SO ₂)	
		1990	1995	1990	1995
1 Agriculture, forestry and fishery	1	258	222	137	123
2 Mining	2	7	6	2	1
3 Foods	3	20	20	52	49
4 Textile products	4	13	12	19	17
5 Pulp, paper and wooden products	5	35	39	48	51
6 Chemical products	6	66	70	70	73
7 Petroleum and coal products	7	45	54	33	47
8 Ceramic, stone and clay products	8	144	173	33	33
9 Iron and steel	9	93	89	63	65
10 Nonferrous metals	10	15	13	17	15
11 Metal products	11	7	8	3	3
12 General machinery	12	9	8	4	4
13 Electrical machinery	13	8	8	4	5
14 Transportation equipment	14	11	10	7	6
15 Precision instruments	15	1	1	0	0
16 Other manufacturing products	16	13	13	17	16
17 Construction	17	116	139	11	13
18 Electricity, gas and heat supply	18	259	258	250	221
19 Water supply and waste management services	19	20	24	15	24
20 Commerce	20	13	13	30	33
21 Commerce	21	1	1	0	0
22 Real estate	22	4	5	3	3
23 Transport	23	2,018	2,123	965	973
24 Communication and broadcasting	24	3	4	1	1
25 Public administration	25	21	19	11	16
26 Education and research	26	22	20	12	14
27 Medical service, health and social security and nursing care	27	15	19	13	17
28 Other public services	28	1	2	1	1
29 Business services	29	11	11	4	5
30 Personal services	30	25	29	11	13
31 Office supplies	31	0	0	0	0
32 Activities not elsewhere classified	32	33	9	14	4
33 Total of intermediate sectors	33	3,305	3,420	1,853	1,846
34 Household consumption expenditures	34	68	90	16	24
35 Grand total	35	3,373	3,510	1,870	1,870

(Source) Center for Global Environmental Research, National Institute for Environmental Studies, Japan,
"Embodied Energy and Emission Intensity Data for Japan Using Input-Output Tables (3EID) – Inventory Data for LCA"