

Trends in Industrial and Energy-Conversion Sectors

(10,000 t-CO₂; 10,000 kl, crude oil equivalents)

Industry	(: target defined in terms of this index)	Fiscal 1990	Fiscal 1997	Fiscal 1998	Fiscal 1999	Fiscal 2000	Fiscal 2001	Fiscal 2002	Fiscal 2003	Compared to fiscal 1990 (%)	Compared to fiscal 2002 (%)
Federation of Electric Power Companies	CO ₂ emissions	27,700	29,200	28,500	30,700	31,700	31,200	34,200	36,300	+31.0%	+6.1%
	CO ₂ emissions intensity	1	0.88	0.85	0.89	0.90	0.90	0.97	1.04		
	Energy consumption	10,800	11,200	10,900	11,700	12,000	11,700	12,800	13,500	+25.0%	+5.5%
	Energy consumption intensity	1	0.86	0.83	0.87	0.87	0.87	0.93	0.99		
	Production activity index	1	1.20	1.21	1.24	1.27	1.25	1.28	1.27		
Portion attributed to industry: these figures are used in the calculation of the 35-industry totals below	CO ₂ emissions	3,100	3,380	3,240	3,360	3,430	3,370	3,780	3,880	+25.2%	+2.6%
	Energy consumption	1,210	1,300	1,240	1,280	1,300	1,270	1,410	1,440	+19.0%	+2.1%
Petroleum Association of Japan	CO ₂ emissions	3,300	4,381	4,322	4,378	4,364	4,383	4,340	4,385	+32.9%	+1.0%
	CO ₂ emissions intensity	1	0.92	0.92	0.91	0.89	0.90	0.90	0.89		
	Energy consumption	1,282	1,700	1,666	1,671	1,675	1,672	1,651	1,684	+31.3%	+2.0%
	Energy consumption intensity	1	0.92	0.92	0.89	0.87	0.87	0.87	0.87		
	Production activity index	1	1.44	1.42	1.47	1.48	1.48	1.47	1.50		
Japan Gas Association	CO ₂ emissions	116	95	91	89	84	77	84	76	-34.6%	-9.5%
	CO ₂ emissions intensity	1	0.57	0.53	0.50	0.45	0.41	0.41	0.36		
	Energy consumption	68.2	51.6	49.3	48.8	46.5	43.0	45.3	39.6	-41.9%	-12.5%
	Energy consumption intensity	1	0.53	0.50	0.47	0.43	0.39	0.38	0.32		
	Production activity index	1	1.43	1.46	1.54	1.60	1.62	1.76	1.82		
Japan Iron and Steel Federation	CO ₂ emissions	19,483	19,502	18,426	18,870	18,227	17,795	18,133	18,240	-6.4%	+0.6%
	CO ₂ emissions intensity	1	0.97	0.96	0.96	0.95	0.95	0.94	0.93		
	Energy consumption	6,396	6,411	6,032	6,170	6,003	5,849	5,972	6,029	-5.7%	+1.0%
	Energy consumption intensity	1	0.97	0.96	0.96	0.95	0.95	0.94	0.93		
	Production activity index	1	0.92	0.81	0.88	0.96	0.91	0.98	0.99		
Japan Chemical Industry Association	CO ₂ emissions	6,891	7,675	7,378	7,739	7,755	7,376	7,506	7,617	+10.5%	+1.5%
	CO ₂ emissions intensity	1	0.93	0.92	0.91	0.91	0.91	0.92	0.91		
	Energy consumption	2,732	3,114	3,002	3,113	3,065	2,918	2,951	2,966	+8.6%	+0.5%
	Energy consumption intensity	1	0.95	0.95	0.93	0.91	0.91	0.91	0.89		
	Production activity index	1	1.20	1.16	1.23	1.23	1.17	1.19	1.22		
Japan Paper Association	CO ₂ emissions	2,533	2,578	2,592	2,630	2,707	2,616	2,637	2,633	+3.9%	-0.2%
	CO ₂ emissions intensity	1	0.96	0.98	0.96	0.97	0.99	0.97	0.97		
	Energy consumption	939	943	947	957	972	931	936	926	-1.4%	-1.1%
	Energy consumption intensity	1	0.95	0.97	0.94	0.94	0.95	0.93	0.92		
	Production activity index	1	1.06	1.04	1.09	1.10	1.04	1.07	1.07		
Cement Association of Japan	CO ₂ emissions	2,743	2,781	2,480	2,465	2,474	2,376	2,249	2,186	-20.3%	-2.8%
	CO ₂ emissions intensity	1	1.02	1.02	1.02	1.02	1.02	1.01	1.01		
	Energy consumption	861	851	756	747	745	714	674	652	-24.3%	-3.3%
	Energy consumption intensity	1	0.99	0.99	0.98	0.98	0.98	0.97	0.96		
	Production activity index	1	0.99	0.89	0.88	0.88	0.85	0.81	0.79		
Japan Electrical Manufacturers' Association, Japan Electronics and Information Technology Industries Association, Communications and Information network Association of Japan, Japan Business Machine and Information System Industries Association	CO ₂ emissions	1,181	1,441	1,314	1,389	1,460	1,398	1,517	1,781	+50.8%	+17.4%
	CO ₂ emissions intensity	1	1.02	1.01	1.05	1.03	1.11	1.19	1.36		
	Energy consumption	672	914	835	848	891	853	868	972	+44.5%	+12.0%
	Energy consumption intensity	1	1.14	1.13	1.13	1.10	1.19	1.20	1.31		
	Production activity index	1	1.19	1.10	1.12	1.20	1.06	1.08	1.11		

Industry	(: target defined in terms of this index)	Fiscal 1990	Fiscal 1997	Fiscal 1998	Fiscal 1999	Fiscal 2000	Fiscal 2001	Fiscal 2002	Fiscal 2003	Compared	Compared
										to fiscal	to fiscal
										1990 (%)	2002 (%)
Japan Federation of Construction Contractors	CO ₂ emissions	923	892	876	718	704	660	643	514	-44.2%	-19.9%
	CO ₂ emissions intensity	1	0.97	0.95	0.94	0.90	0.92	0.97	0.90		
	Energy consumption	429	416	409	336	324	301	286	229	-46.7%	-19.9%
	Energy consumption intensity	1	0.97	0.95	0.95	0.89	0.90	0.93	0.86		
	Production activity index	1	1.00	1.00	0.82	0.85	0.78	0.72	0.62		
Japan Automobile Manufacturers Association	CO ₂ emissions	759	695	662	641	625	585	595	579	-23.7%	-2.7%
	CO ₂ emissions intensity	1	0.97	1.00	0.99	0.92	0.83	0.77	0.75		
	Energy consumption	410	377	357	343	333	313	316	308	-24.8%	-2.4%
	Energy consumption intensity	1	0.98	1.00	0.98	0.91	0.83	0.76	0.74		
	Production activity index	1	0.94	0.87	0.85	0.90	0.93	1.01	1.01		
Japan Auto Parts Industries Association	CO ₂ emissions	718	691	647	653	641	591	647	671	-6.5%	+3.7%
	CO ₂ emissions intensity	1	0.94	0.93	0.91	0.86	0.81	0.83	0.81		
	Energy consumption	375	406	390	381	361	335	350	348	-7.4%	-0.8%
	Energy consumption intensity	1	1.05	1.07	1.02	0.93	0.87	0.86	0.81		
	Production activity index	1	1.03	0.97	1.00	1.03	1.02	1.08	1.15		
Japan Federation of Housing Organizations	CO ₂ emissions	538	537	508	519	497	497	487	454	-15.5%	-6.7%
	CO ₂ emissions intensity	1	1.08	1.14	1.08	1.06	1.14	1.18	1.08		
	Energy consumption	205	204	193	169	164	164	188	175	-14.4%	-6.7%
	Energy consumption intensity	1	1.08	1.14	0.93	0.92	0.99	1.19	1.10		
	Production activity index	1	0.92	0.83	0.89	0.87	0.81	0.77	0.78		
Japan Mining Industry Association	CO ₂ emissions	488	484	482	495	506	503	502	517	+6.0%	+2.9%
	CO ₂ emissions intensity	1	0.92	0.93	0.90	0.87	0.88	0.90	0.91		
	Energy consumption	205	210	213	218	214	216	215	215	+4.9%	+0.3%
	Energy consumption intensity	1	0.95	0.97	0.95	0.88	0.91	0.91	0.90		
	Production activity index	1	1.07	1.06	1.12	1.18	1.16	1.15	1.16		
Japan Lime Association	CO ₂ emissions	297	240	212	225	233	209	226	232	-21.7%	+2.9%
	CO ₂ emissions intensity	1	0.88	0.85	0.86	0.88	0.84	0.86	0.84		
	Energy consumption	98.6	81.2	72.4	77.2	78.7	70.7	75.6	76.5	-22.5%	+1.2%
	Energy consumption intensity	1	0.90	0.88	0.89	0.89	0.86	0.86	0.83		
	Production activity index	1	0.91	0.84	0.88	0.89	0.83	0.89	0.94		
The Japan Rubber Manufacturers Association	CO ₂ emissions	195	192	188	195	190	186	200	218	+11.6%	+8.9%
	CO ₂ emissions intensity	1	0.98	0.97	0.96	0.93	0.95	0.97	1.00		
	Energy consumption	96.0	100	99.5	100.8	95.9	94.3	98.7	104	+8.3%	+5.4%
	Energy consumption intensity	1	1.03	1.05	1.01	0.95	0.98	0.97	0.97		
	Production activity index	1	1.01	0.99	1.04	1.05	1.01	1.06	1.11		
The Federation of Pharmaceutical Manufacturers Associations of Japan Japan Pharmaceutical Manufacturers Association	CO ₂ emissions	158	189	191	207	207	206	211	212	+34.1%	+0.4%
	CO ₂ emissions intensity	1	0.90	0.93	0.93	0.88	0.83	0.83	0.83		
	Energy consumption	74.6	96.8	99.1	104	102	103	103	102	+36.4%	-1.4%
	Energy consumption intensity	1	0.97	1.02	1.00	0.91	0.88	0.86	0.84		
	Production activity index	1	1.34	1.30	1.40	1.49	1.58	1.61	1.62		
Flat Glass Association	CO ₂ emissions	178	164	145	138	135	137	133	135	-24.0%	+1.8%
	CO ₂ emissions intensity	1	1.15	1.17	1.09	1.10	1.11	1.12	0.99		
	Energy consumption	71.4	65.0	58.8	55.4	53.8	55.1	53.3	53.3	-25.3%	+0.0%
	Energy consumption intensity	1	1.14	1.18	1.10	1.10	1.11	1.12	0.97		
	Production activity index	1	0.80	0.70	0.71	0.69	0.69	0.67	0.77		

Industry	(: target defined in terms of this index)	Fiscal 1990	Fiscal 1997	Fiscal 1998	Fiscal 1999	Fiscal 2000	Fiscal 2001	Fiscal 2002	Fiscal 2003	Compared	Compared
										to fiscal 1990 (%)	to fiscal 2002 (%)
Japan Aluminum Association	CO ₂ emissions	149	162	152	161	163	155	162	166	+11.5%	+2.6%
	CO ₂ emissions intensity	1	0.94	0.95	0.94	0.93	0.97	0.96	0.95		
	Energy consumption	73.4	84.5	79.8	83.1	80.8	76.8	78.4	78.6	+7.1%	+0.3%
	Energy consumption intensity	0.95	0.95	0.96	0.94	0.89	0.92	0.90	0.86		
	Production activity index	1	1.16	1.08	1.15	1.18	1.08	1.13	1.18		
Brewers Association of Japan	CO ₂ emissions	110	119	114	111	105	102	97.7	92.1	-16.5%	-5.7%
	CO ₂ emissions intensity	1	0.99	0.95	0.91	0.87	0.84	0.83	0.84		
	Energy consumption	52.6	58.8	58.9	56.8	52.6	51.9	48.1	43.8	-16.8%	-9.1%
	Energy consumption intensity	1	1.03	1.02	0.98	0.92	0.90	0.86	0.84		
	Production activity index	1	1.09	1.09	1.10	1.09	1.09	1.06	0.99		
Japan Electric Wire and Cable Makers' Association	CO ₂ emissions	100	93.3	87.7	88.2	92.4	85.9	85.2	89.2	-10.9%	+4.7%
	CO ₂ emissions intensity (copper/aluminum)	1	0.97	1.04	1.11	1.07	1.11	1.10	1.16		
	Energy consumption	58.8	61.0	58.4	56.9	57.1	53.2	50.1	49.5	-15.8%	-1.3%
	Energy consumption intensity (copper/aluminum)	1	1.07	1.17	1.21	1.12	1.16	1.10	1.10		
	Production activity index	1	0.85	0.81	0.63	0.46	0.40	0.42	0.46		
	Production activity index (copper/aluminum)	1	0.89	0.79	0.72	0.76	0.65	0.68	0.68		
		1	5.38	5.29	8.33	13.82	18.02	13.03	11.75		
Japan Auto-body Industries Association, Inc.	CO ₂ emissions	92.6	84.9	83.1	85.4	90.0	90.9	95.1	96.6	+4.4%	+1.7%
	CO ₂ emissions intensity	1	0.95	0.95	0.92	0.88	0.75	0.72	0.71		
	Energy consumption	48.4	48.1	48.1	47.7	49.0	49.4	50.3	50.0	+3.4%	-0.5%
	Energy consumption intensity	1	1.03	1.05	0.99	0.92	0.77	0.73	0.71		
	Production activity index	1	0.96	0.95	1.00	1.11	1.32	1.43	1.46		
Japan Dairy Industry Association	CO ₂ emissions	85.7	95.8	98.3	102	102	105	110	118	+37.2%	+6.4%
	CO ₂ emissions intensity	1.00	0.94	0.95	0.97	1	1.02	1.13	1.11		
	Energy consumption	40.2	48.4	50.2	51.2	49.9	51.4	52.6	54.7	+36.1%	+4.0%
	Energy consumption intensity	0.97	0.97	1.00	1.00	1	1.03	1.08	1.07		
	Production activity index	1	1.20	1.21	1.23	1.20	1.20	1.18	1.23		
Japan Brass Makers Association	CO ₂ emissions	65.8	57.5	50.9	54.4	56.7	45.5	49.4	54.3	-17.4%	+10.0%
	CO ₂ emissions intensity	1	0.88	0.84	0.87	0.85	0.89	0.88	0.93		
	Energy consumption	37.0	35.4	31.6	32.7	33.3	26.7	27.8	29.3	-20.9%	+5.2%
	Energy consumption intensity	1	0.97	0.93	0.94	0.89	0.92	0.88	0.89		
	Production activity index	1	0.99	0.92	0.95	1.02	0.78	0.85	0.89		
Japan Society of Industrial Machinery Manufacturers	CO ₂ emissions	63.2	57.1	50.4	49.6	51.3	49.2	50.2	52.3	-17.3%	+4.1%
	CO ₂ emissions intensity	1	0.97	1.08	1.07	1.14	1.15	1.24	1.24		
	Energy consumption	35.0	34.3	31.2	29.7	29.4	28.0	27.5	27.4	-21.9%	-0.6%
	Energy consumption intensity	1	1.00	1.07	1.02	1.08	1.05	1.08	1.08		
	Production activity index	1	0.98	0.89	0.79	0.82	0.74	0.75	0.72		
Japan Bearing Industrial Association	CO ₂ emissions	62.3	58.7	53.8	55.1	59.9	55.4	61.1	65.4	+4.9%	+7.1%
	CO ₂ emissions intensity	1	0.99	0.96	0.96	0.95	1.00	0.99	1.01		
	Energy consumption	35.9	36.4	34.4	34.0	35.5	32.9	34.9	35.6	-0.8%	+1.9%
	Energy consumption intensity	1	1.02	0.96	0.96	0.91	0.95	0.91	0.88		
	Production activity index	1	0.93	0.98	0.98	1.07	0.95	1.05	1.11		

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										1990 (%)	2002 (%)
Japan Sugar Refiners' Association	CO ₂ emissions	58.0	48.9	47.7	47.5	49.3	48.9	46.0	48.2	-16.9%	+4.7%
	CO ₂ emissions intensity	1	0.94	0.94	0.94	0.95	0.96	0.93	0.95		
	Energy consumption	24.3	22.1	21.6	21.5	22.0	21.8	20.1	21.0	-13.8%	+4.3%
	Energy consumption intensity	1	1.01	1.02	1.02	1.01	1.03	0.97	0.99		
	Production activity index	1	0.90	0.88	0.87	0.90	0.88	0.86	0.87		
Japan Sanitary Equipment Industry Association	CO ₂ emissions	47.9	41.6	34.9	35.6	36.5	37.3	35.4	36.4	-23.9%	+2.8%
	CO ₂ emissions intensity	1	0.81	0.82	0.83	0.80	0.83	0.80	0.78		
	Energy consumption	22.4	21.4	18.3	18.4	18.3	18.2	17.0	16.9	-24.8%	-0.6%
	Energy consumption intensity	1	0.89	0.91	0.91	0.86	0.86	0.82	0.77		
	Production activity index	1	1.08	0.89	0.89	0.95	0.94	0.93	0.98		
The Japan Soft Drinks Association	CO ₂ emissions	46.0	65.6	67.8	74.1	80.3	83.5	86.7	91.3	+98.6%	+5.3%
	CO ₂ emissions intensity	1	0.98	0.99	1.02	1.07	1.05	1.10	1.11		
	Energy consumption	20.3	30.7	32.5	35.5	38.1	39.9	41.2	42.8	+110.5%	+3.8%
	Energy consumption intensity	1	1.04	1.07	1.10	1.15	1.13	1.18	1.18		
	Production activity index	1	1.45	1.49	1.58	1.63	1.73	1.72	1.79		
Limestone Association of Japan	CO ₂ emissions	45.4	42.0	39.9	40.6	41.7	41.3	39.1	36.5	-19.8%	-6.7%
	CO ₂ emissions intensity	1	0.90	0.95	0.97	0.97	0.98	0.94	0.97		
	Energy consumption	22.6	22.0	21.1	20.9	20.9	20.6	19.0	17.2	-23.6%	-9.2%
	Energy consumption intensity	1	0.96	1.01	1.02	0.99	0.99	0.92	0.92		
	Production activity index	1	1.02	0.93	0.91	0.94	0.92	0.91	0.82		
Japan Machine Tool Builders' Association	CO ₂ emissions	23.1	20.9	22.9	20.1	20.7	19.5	18.4	20.4	-11.6%	+10.6%
	CO ₂ emissions intensity	1	1	1.01	1.19	1.08	1.07	1.37	1.24		
	Energy consumption	14.5	14.5	16.3	13.7	14.1	13.3	11.9	12.5	-13.5%	+5.2%
	Energy consumption intensity	1	1	1.04	1.17	1.06	1.06	1.29	1.10		
	Production activity index	1	1.00	1.09	0.81	0.91	0.87	0.64	0.79		
Flour Millers Association	CO ₂ emissions	17.0	18.7	18.1	18.7	19.2	19.0	20.4	22.6	+32.9%	+11.0%
	CO ₂ emissions intensity	1	1.00	0.92	0.95	0.97	0.96	1.03	1.12		
	Energy consumption	10.8	12.6	12.9	12.7	12.5	12.4	12.5	13.0	+20.4%	+4.1%
	Energy consumption intensity	1	1.06	1.04	1.02	0.99	0.98	1.00	1.02		
	Production activity index	1	1.10	1.15	1.16	1.17	1.16	1.16	1.19		
Japan Shipbuilders' Association of Japan (A) The Cooperative Association of Japan Shipbuilders (B)	CO ₂ emissions	15.0	19.2	18.0	18.7	18.3	18.2	24.2	26.0	+72.5%	+7.1%
	CO ₂ emissions intensity (A)	1	0.88	0.80	0.77	0.73	0.74	1.01	0.98		
	CO ₂ emissions intensity (B)	1	1	1	1	1	1.23	1.22	1.29		
	Energy consumption	9.8	14.3	13.9	13.6	12.6	12.5	15.6	15.5	+58.3%	-0.4%
	Energy consumption intensity (A)	1	0.96	0.91	0.81	0.88	0.90	0.95	0.98		
	Energy consumption intensity (B)	1	0.92	0.97	0.88	0.87	0.88	0.87	0.89		
	Production activity index (A)	1	1.45	1.50	1.62	1.42	1.40	1.40	1.55		
Production activity index (B)	1	1	1	1	1	0.77	0.85	0.86			
Japan Industry Vehicles Association	CO ₂ emissions	6.1	6.1	5.7	6.2	6.1	5.4	5.8	6.0	-1.4%	+4.6%
	CO ₂ emissions intensity	1	1.23	1.48	1.56	1.38	1.35	1.42	1.39		
	Energy consumption	3.2	3.5	3.3	3.4	3.4	3.0	3.1	3.2	-2.1%	+1.3%
	Energy consumption intensity	1	1.33	1.62	1.63	1.45	1.44	1.46	1.38		
	Production activity index	1	0.81	0.63	0.65	0.72	0.65	0.66	0.71		

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										1990 (%)	2002 (%)
Japan Association of Rolling Stock Industries	CO ₂ emissions	4.3	3.4	3.2	3.3	3.2	3.2	3.0	3.1	-28.9%	+3.2%
	CO ₂ emissions intensity	1	0.81	0.77	0.70	0.74	0.77	0.64	0.66		
	Energy consumption	2.4	2.0	2.0	2.0	1.9	1.9	1.7	1.7	-29.4%	-1.3%
	Energy consumption intensity	1	0.89	0.88	0.78	0.79	0.83	0.67	0.66		
	Production activity index	1	0.96	0.96	1.08	1.01	0.95	1.07	1.07		
Emissions from industrial processes	CO ₂ emissions	6,040	5,897	5,281	5,271	5,324	5,159	5,033	4,973		
Revisions	CO ₂ emissions	-75	-327	-334	-259	-254	-242	-173	-89		
	Energy consumption	-155	-167	-142	-144	-226	-210	-202	-212		
Total	CO ₂ emissions	50,555	52,481	49,649	50,692	50,301	48,847	49,739	50,239	-0.6%	+1.0%
	Energy consumption	16,637	17,790	16,955	17,154	16,956	16,416	16,703	16,831	+1.2%	+0.8%

* "Emissions from industrial processes" refers to CO₂ emitted by non-energy sources in the course of the manufacturing process.

* Total CO₂ emissions and energy consumption for the 35 industries are calculated on the basis of "generating end" electric power input per unit output for the respective industries on a fiscal year basis. On the other hand, in follow-up surveys, industries may also choose to report emissions in terms of "demand end" electric power input per unit output or fixed (the ratio in fiscal 1990) electric power input per unit output (as have the Japan Gas Association, Japan Iron and Steel Federation, Japan Electrical Manufacturers' Association, Japan Electronics and Information Technology Industries Association, Communications and Information Network Association of Japan, Japan Business Machine and Information System Industries Association, Japan Automobile Manufacturers Association, Japan Mining Industry Association, and Japan Machine Tool Builders' Association). Revisions are defined as the differences between the totals of data submitted by industries and the totals of the revised industry figures.

* Due to a revision of the Caloric Value Table, calculations of emissions from fiscal 2000 on are based on different heat conversion coefficients from those used through fiscal 1999.

* In cases where an industry uses a year other than fiscal 1990 as the base year, intensity indexes are calculated based on figures for the base year used by that industry (Japan Society of Industrial Machinery Manufacturers, Japan Bearing Industrial Association, and Japan Machine Tool Builders' Association use fiscal 1997 as the base year, Japan Dairy Industry Association uses fiscal 2000 as the base year, and Japan Aluminum Association uses fiscal 1995 as the base year for the energy consumption intensity index).