

Implementation of SEEA in Japan: First experiences

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Recent policies related to SEEA in Japan

- Master Plan Concerning the Development of Official Statistics(March,2018)
 - 2 Development of statistics that accurately grasp changes in social and economic situations
 - (5) ... “Further, responses to international initiatives SEEA and SDGs have become important.”
- Follow-up on the Growth Strategy(July,2021) and Green Growth Strategy Through Achieving Carbon Neutrality in 2050(June,2021)
 - “ In addition, in order to achieve Carbon Neutrality, related ministries and agencies will collaborate in research and development of statistics(such as Green GDP(tentative name))and indicators that take environmental factors into account, in line with the System of Environmental and Economic Accounts(SEEA), an international standard set by the United Nations, and research by international organizations.

Recent policies related to SEEA in Japan

- Basic Policy on Economic and Fiscal Management and Reform2021(June,2021)

“In addition, research and development of Green GDP(tentative name)will be prompt.”

⇒ The Growth Strategy clearly states that research will be conducted in line with SEEA.

- As a first step, Air Emission Accounts is estimated to understand the relationship between GDP and GHG emissions by industry.

Data Material and Compiled Format

1. Industries and households

Main data①: National Greenhouse Gas Inventory Report of JAPAN(2021)

Main data②: General Energy Statistics

⇒ Commercial Industry(incl, Electricity) and Transportation is divided by energy consumption.

In term of other sectors, reclassification from CRF to JSIC

2. Bridging Item

Main data①: Entrance of Vessels by Nationality

Main data②: Arrival of Aircraft by Nationality

Main data③: Air Transport CO2 Emissions(OECDstat)

3. Compiled format

① **32 industries based on JSIC, 3 Household items and 5 Bridging Items**
(7 industries and 1 Household item in Air Emission Accounts – OECD Estimates)

② **FY1990-FY2019**

③ Only CO₂, CH₄, N₂O is compiled

Industrial Classification(Based JSIC)

A-B: AGRICULTURE AND FORESTRY and FISHERIES	
C: MINING AND QUARRYING OF STONE	
D: CONSTRUCTION	
E: MANUFACTURING	
E: MANUFACTURING	E09: MANUFACTURE OF FOOD
	E11: MANUFACTURE OF TEXTILE PRODUCTS
	E14: MANUFACTURE OF PULP, PAPER AND PAPER PRODUCTS
	E16, E17: MANUFACTURE OF CHEMICAL AND ALLIED PRODUCT, and MANUFACTURE OF PETROLEUM AND COAL PRODUCTS
	E21: MANUFACTURE OF CERAMIC, STONE AND CLAY PRODUCTS
	E22: MANUFACTURE OF IRON AND STEEL
	E23: MANUFACTURE OF NON-FERROUS METALS AND PRODUCTS
	E24-E27: MANUFACTURE OF FABRICATED METAL PRODUCTS , GENERAL-PURPOSE MACHINERY, PRODUCTION MACHINERY and BUSINESS ORIENTED MACHINERY
Miscellaneous Manufacturing Industry (other than the above)	
F: ELECTRICITY, GAS, HEAT SUPPLY AND WATER	
F: ELECTRICITY, GAS, HEAT SUPPLY AND WATER	F33: PRODUCTION, TRANSMISSION AND DISTRIBUTION OF ELECTRICITY
	F34-F36: PRODUCTION AND DISTRIBUTION OF GAS, HEAT SUPPLY and COLLECTION, PURIFICATION AND DISTRIBUTION OF WATER, AND SEWAGE COLLECTION, PROCESSING AND DISPOSAL
G: INFORMATION AND COMMUNICATIONS	
H: TRANSPORT AND POSTAL SERVICES	
H: TRANSPORT AND POSTAL SERVICES	H42-H44 and H47-H49: RAILWAY TRANSPORT, ROAD PASSENGER TRANSPORT, ROAD FREIGHT TRANSPORT, WAREHOUSING, SERVICES INCIDENTAL TO TRANSPORT, POSTAL SERVICES, INCLUDING MAIL DELIVERY
	H45: WATER TRANSPORT
	H46: AIR TRANSPORT
I: WHOLESALE AND RETAIL TRADE	
J: FINANCE AND INSURANCE	
K: REAL ESTATE AND GOODS RENTAL AND LEASING	
L-N: SCIENTIFIC RESEARCH, PROFESSIONAL AND TECHNICAL SERVICES and LIVING-RELATED AND PERSONAL SERVICES AND AMUSEMENT SERVICES	
M: ACCOMMODATIONS, EATING AND DRINKING SERVICES	
O: EDUCATION, LEARNING SUPPORT	
P: MEDICAL, HEALTH CARE AND WELFARE	
Q-R: COMPOUND SERVICES and SERVICES, N. E. C.	
Q-R: COMPOUND SERVICES and SERVICES, N. E. C.	R88: WASTE DISPOSAL BUSINESS
	Q and R89-R96: Miscellaneous Services
S-T: GOVERNMENT, EXCEPT ELSEWHERE CLASSIFIED and INDUSTRIES UNABLE TO CLASSIFY	

Household and Bridging items

HH:Households		
	HH: Transport	
HH:Households	HH: Housing, water, electricity, gas and other fuels	
	HH: HH - Other	
BI:Bridging items		
	less National residents abroad	
	less National residents abroad	NRA-WATER: Water transport
		NRA-AIR: Air transport
	plus Non-residents on the territory	
	plus Non-residents on the territory	NRT-WATER: water transport
		NRT-AIR: Air transport
	OTHER: Other adjustments and statistical discrepancy	
	INV-TOTAL: Total emissions as reported to international conventions (UNFCCC)	

Air Emission Accounts in Japan (CO₂, FY1990–FY2006)

Tentative estimation
Presentation only

Unit:kt

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
A, B	21,551	22,026	22,053	21,557	20,296	20,082	20,904	20,699	20,660	20,174	20,296	21,050	20,349	20,338	20,640	20,086	18,996
C	3,735	3,356	3,245	3,179	3,108	2,929	2,825	2,692	2,549	2,409	2,258	2,153	2,027	1,913	1,914	1,818	1,677
D	5,709	5,548	5,676	5,922	6,046	6,227	5,918	5,616	5,374	5,168	4,770	4,661	4,395	4,139	4,054	3,810	3,853
E	470,113	467,255	459,977	461,738	468,895	476,000	481,084	477,449	444,612	452,055	464,203	455,204	458,304	457,706	459,379	455,258	453,549
E09	7,715	8,151	8,646	9,137	9,367	10,205	10,013	10,430	11,183	11,681	11,598	12,039	12,468	12,143	12,551	12,308	12,019
E11	15,933	15,238	15,155	14,836	14,755	14,731	14,267	14,505	14,636	13,865	12,960	12,687	12,501	12,343	11,638	9,672	8,866
E14	26,496	26,888	26,734	27,549	28,808	30,669	30,664	30,544	29,643	30,096	30,878	30,441	30,126	29,789	30,036	28,931	27,331
E16, E17	131,150	131,092	129,108	131,690	131,996	133,589	137,123	138,005	124,949	128,233	132,683	128,437	127,931	127,682	130,614	133,077	132,680
E21	92,866	94,788	95,656	95,550	97,277	97,606	97,755	94,207	84,418	83,862	84,072	81,970	79,055	78,652	76,364	76,714	76,835
E22	157,877	153,267	146,215	145,942	148,187	149,917	152,465	154,854	146,702	150,721	158,844	156,296	161,965	163,199	164,082	160,663	162,696
E23	8,487	8,342	8,331	7,985	7,765	7,410	6,642	6,898	6,710	6,642	6,343	6,377	6,296	6,310	6,192	5,716	5,666
E24–E27	20,930	20,881	20,781	20,461	21,156	22,249	22,929	18,046	16,354	16,961	16,680	16,546	17,059	16,388	16,244	16,484	16,518
others	8,659	8,609	9,350	8,587	9,584	9,623	9,227	9,959	10,017	9,993	10,146	10,411	10,902	11,199	11,659	11,695	10,937
F	311,683	313,951	320,900	301,193	338,914	326,982	328,430	322,973	313,532	333,310	341,319	334,669	362,460	379,862	374,601	389,208	378,758
F33	309,676	311,950	318,687	298,991	336,897	324,883	326,524	320,911	311,425	331,091	339,199	332,611	360,100	377,947	372,074	386,404	376,494
F34–F36	2,007	2,001	2,213	2,201	2,017	2,099	1,906	2,061	2,107	2,219	2,119	2,058	2,360	1,915	2,527	2,804	2,264
G	223	212	218	226	206	221	225	251	283	309	314	333	349	336	356	360	372
H	170,450	182,746	181,822	181,165	184,285	193,903	194,310	203,061	197,895	197,715	194,443	198,319	195,302	189,000	184,731	181,027	179,004
I	3,855	3,771	3,689	3,692	3,475	3,646	3,565	3,513	3,600	3,735	3,578	3,969	4,322	4,392	4,580	4,675	5,048
J	350	359	363	376	376	400	386	398	416	428	417	399	385	350	329	299	286
K	1,297	1,383	1,449	1,548	1,607	1,751	1,742	1,839	1,971	2,078	2,081	2,039	2,017	1,902	1,858	1,764	1,736
L–N	6,467	6,900	7,251	7,689	7,892	8,642	8,806	9,226	10,048	10,826	11,042	11,555	12,163	12,211	12,451	12,389	12,031
M	7,196	7,422	8,240	9,183	8,946	10,283	10,021	10,539	11,344	11,951	11,648	12,060	12,210	11,201	11,260	10,793	11,462
O	3,106	3,147	3,164	3,241	3,195	3,390	3,387	3,497	3,732	3,956	3,957	4,133	4,340	4,331	4,406	4,384	4,296
P	5,000	5,500	6,030	6,618	6,892	7,727	7,939	8,545	9,520	10,360	10,669	10,759	10,836	10,253	10,261	9,876	9,097
Q, R	17,550	17,677	18,862	18,817	21,332	21,961	22,502	23,322	23,739	24,020	24,247	23,065	22,538	22,298	21,601	20,830	19,834
R88	15,734	15,888	17,062	16,974	19,559	20,080	20,625	21,381	21,672	21,833	22,070	20,876	20,333	20,186	19,536	18,852	17,854
Q, R89–R96	1,816	1,788	1,800	1,842	1,773	1,881	1,876	1,941	2,067	2,187	2,177	2,189	2,205	2,112	2,065	1,978	1,980
S, T	37,346	35,493	33,014	34,840	36,126	36,402	31,762	33,636	34,916	36,305	36,034	35,667	35,280	36,608	41,352	44,173	42,675
HH	107,671	108,657	119,231	126,792	131,345	135,284	143,219	133,856	138,495	144,177	149,944	145,508	149,551	147,612	146,226	146,663	140,489
Total Industries +Total Households	1,173,303	1,185,403	1,195,183	1,187,776	1,242,936	1,255,830	1,267,024	1,261,113	1,222,687	1,258,976	1,281,221	1,265,543	1,296,829	1,304,451	1,299,999	1,307,415	1,283,163
BI less NRA plus NRT OTHER	15,296	15,712	15,787	15,436	15,663	16,211	15,494	16,332	17,693	17,365	16,846	15,777	17,709	16,984	17,138	17,044	15,801
INV–TOTAL	1,158,007	1,169,692	1,179,396	1,172,339	1,227,273	1,239,620	1,251,531	1,244,781	1,204,993	1,241,611	1,264,375	1,249,766	1,279,120	1,287,468	1,282,862	1,290,371	1,267,362

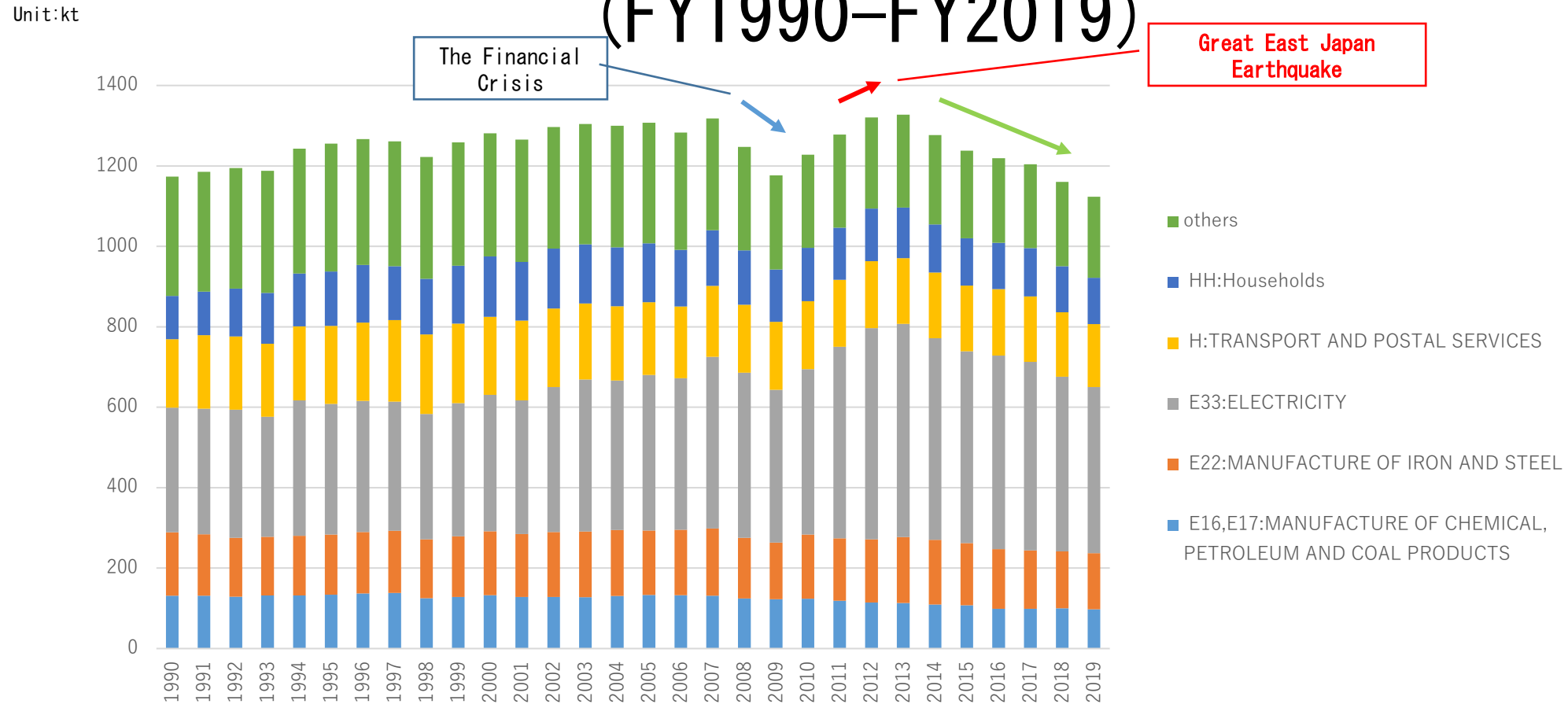
Air Emission Accounts in Japan (CO₂, FY2007–FY2019)

Tentative estimation
Presentation only

Unit:kt

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
A, B	19,204	16,459	19,547	18,203	16,920	16,707	15,355	15,052	16,646	17,428	17,551	14,652	14,828
C	1,502	1,347	1,382	1,341	1,498	1,489	1,283	1,252	1,187	1,136	1,118	1,084	1,077
D	3,642	2,827	3,075	3,399	4,785	4,808	4,073	3,993	4,358	4,543	4,715	4,609	4,131
E	449,755	415,167	391,524	409,828	403,178	401,192	406,553	396,292	385,122	365,296	360,784	359,946	350,311
E09	10,991	10,169	9,979	10,001	10,988	10,755	9,996	9,763	8,756	8,789	8,130	9,166	8,391
E11	7,932	6,796	6,444	7,013	6,460	5,964	6,768	6,553	6,714	6,015	5,890	5,642	5,386
E14	26,228	24,358	22,919	22,088	22,618	23,160	23,196	22,247	22,781	20,363	20,050	19,781	18,545
E16, E17	131,516	124,233	122,362	124,048	119,050	114,377	113,377	109,134	107,630	98,491	98,670	99,759	97,596
E21	74,753	70,292	62,061	61,527	61,770	62,592	64,870	63,791	61,791	60,742	60,935	60,772	58,652
E22	167,033	150,995	141,106	159,267	154,854	157,367	163,756	161,246	154,838	148,623	145,526	141,856	139,797
E23	5,065	4,814	4,075	4,007	3,879	4,044	3,783	3,674	3,281	3,557	3,163	3,339	2,960
E24–E27	15,677	13,658	13,096	12,424	13,787	13,209	11,396	10,667	9,966	9,842	9,815	10,508	9,797
others	10,559	9,852	9,482	9,453	9,771	9,724	9,411	9,216	9,365	8,874	8,604	9,123	9,187
F	430,165	414,722	383,977	415,781	481,295	530,464	534,642	505,606	480,658	486,444	472,852	438,043	416,246
F33	426,646	410,611	379,954	411,295	476,698	524,820	530,000	501,077	476,392	481,566	468,878	434,479	413,153
F34–F36	3,519	4,111	4,023	4,486	4,597	5,643	4,642	4,529	4,266	4,879	3,974	3,564	3,093
G	349	415	435	445	432	477	734	509	375	367	428	451	401
H	176,766	169,036	168,708	168,822	166,228	166,388	163,427	163,513	163,750	165,281	162,696	160,140	156,381
I	4,865	4,196	4,413	5,142	4,932	4,594	4,172	4,524	3,786	3,942	3,324	4,186	3,673
J	244	300	291	284	276	248	273	280	242	246	249	236	234
K	1,621	1,261	1,195	1,242	1,452	1,245	1,323	1,276	1,135	1,327	1,395	1,312	1,368
L–N	11,281	11,544	9,289	9,381	8,645	8,339	7,693	7,916	7,552	6,847	6,773	7,314	6,847
M	9,880	9,647	9,203	8,622	10,715	10,630	9,828	9,160	9,414	8,210	7,956	9,586	7,736
O	4,066	3,947	3,660	3,864	3,906	3,698	5,098	4,822	4,674	4,930	4,725	4,891	4,670
P	7,911	7,118	7,188	6,897	7,785	7,506	8,331	7,974	9,133	9,299	7,649	7,937	7,421
Q, R	20,016	19,896	17,221	17,881	17,572	17,775	17,305	16,956	16,887	16,415	15,573	16,730	16,340
R88	18,171	18,256	15,509	16,293	15,511	15,938	15,616	15,357	15,381	14,870	14,185	15,265	15,046
Q, R89–R96	1,845	1,639	1,712	1,588	2,060	1,837	1,688	1,600	1,507	1,545	1,388	1,465	1,293
S, T	38,558	34,500	25,179	24,008	19,270	13,842	21,180	17,880	15,641	12,501	16,731	15,094	16,321
HH	138,480	135,089	130,703	133,213	129,475	131,080	126,241	119,877	117,484	115,197	119,965	114,412	115,256
Total Industries +Total Households	1,318,305	1,247,472	1,176,991	1,228,352	1,278,363	1,320,479	1,327,510	1,276,883	1,238,042	1,219,409	1,204,483	1,160,623	1,123,241
BI													
less NRA	15,171	15,159	13,778	13,536	13,497	14,469	11,909	12,976	14,327	15,562	16,399	17,238	17,106
plus NRT	-	-	-	-	-	-	-	-	-	-	-	-	-
OTHER	-	-	-	-	-	-	-	-	-	-	-	-	-
INV-TOTAL	1,303,134	1,232,314	1,163,213	1,214,816	1,264,866	1,306,010	1,315,343	1,263,729	1,223,396	1,203,718	1,188,123	1,143,458	1,105,881

CO2 trends in main 5 sectors (FY1990–FY2019)



Because of Great East Japan Earthquake in 2011, CO2 emissions have been increased by about 3.8% from FY2011 to FY2013.

Since 2014, CO2 emissions is steadily decreasing due to renewable energy and energy conservation.

Air Emission Accounts in Japan (CH₄, FY1990–FY2006)

Tentative estimation
Presentation only

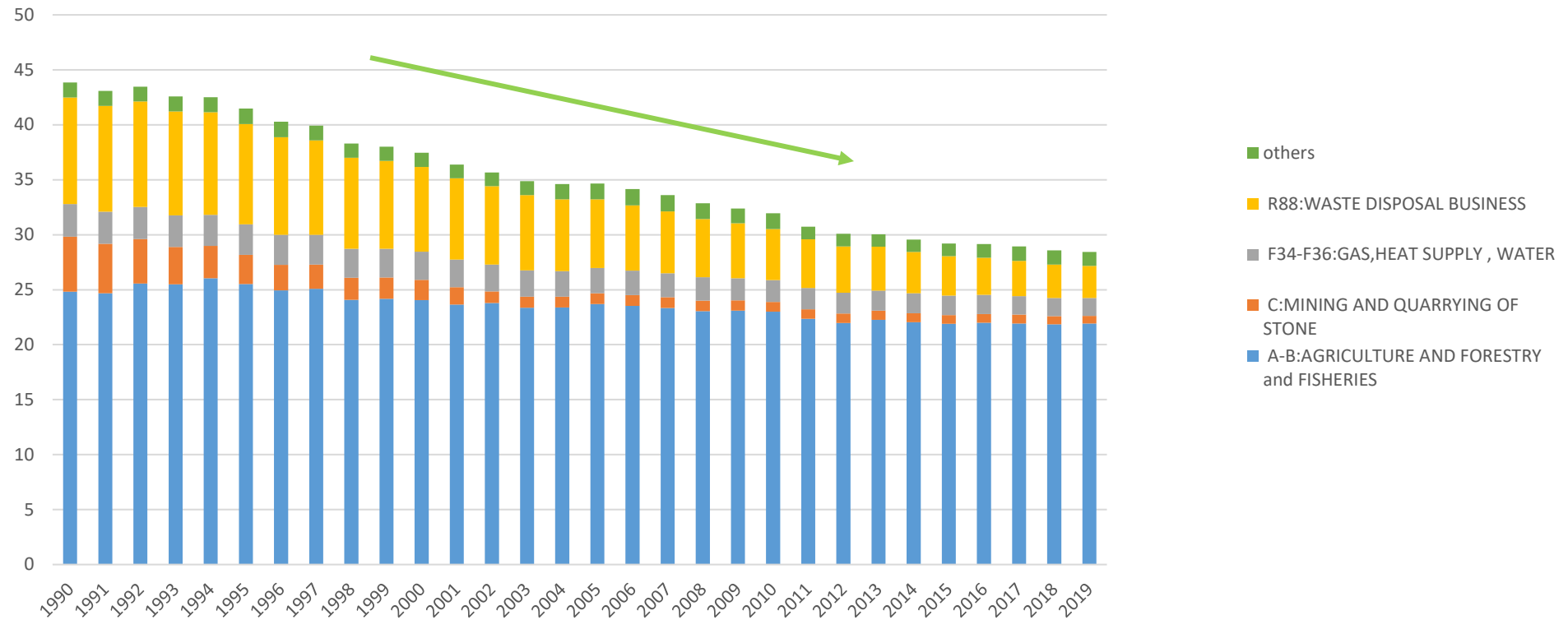
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
A, B	24,826	24,675	25,569	25,499	26,037	25,525	24,944	25,088	24,071	24,165	24,057	23,638	23,796	23,359	23,378	23,699	23,536
C	4,996	4,490	4,027	3,387	2,959	2,654	2,317	2,198	2,012	1,957	1,839	1,599	1,056	1,017	977	976	980
D	11	11	11	12	12	13	12	12	11	11	11	9	8	10	10	10	11
E	820	800	758	758	763	769	780	700	640	624	627	567	583	616	662	682	733
F	2,989	2,967	2,948	2,895	2,835	2,819	2,780	2,746	2,691	2,664	2,620	2,552	2,483	2,425	2,381	2,344	2,267
F33	26	28	28	27	31	45	49	51	48	53	51	52	50	49	45	47	47
F34–F36	2,963	2,939	2,920	2,868	2,804	2,774	2,731	2,695	2,643	2,611	2,569	2,500	2,433	2,376	2,336	2,297	2,221
G	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H	237	246	243	234	231	237	234	245	235	231	227	224	216	202	189	178	168
I	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
J	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
K	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
L–N	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
O	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Q, R	9,687	9,616	9,608	9,460	9,349	9,107	8,873	8,596	8,277	7,974	7,687	7,406	7,143	6,856	6,539	6,243	5,929
R88	9,687	9,616	9,608	9,460	9,349	9,107	8,873	8,596	8,277	7,974	7,687	7,406	7,143	6,856	6,539	6,243	5,929
Q, R89–R96	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
S, T	32	36	41	56	60	75	53	66	82	102	108	120	105	113	196	257	290
HH	246	243	267	275	270	277	295	275	275	275	290	274	282	268	266	268	248
Total Industries +Total Households	43,844	43,084	43,472	42,576	42,515	41,476	40,288	39,924	38,296	38,004	37,466	36,389	35,672	34,867	34,598	34,658	34,163
BI	15.0714	14.8164	14.4769	13.2842	11.7673	7.53481	8.50601	9.14840	8.22009	7.50632	6.33304	6.65641	6.38816	6.45115	6.64650	6.07922	
less NRA	3	6	8	7	7	9	7	7	7	3	7	5	2	5	3	6	
plus NRT	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
OTHER	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
INV–TOTAL	43828.48	43069.68	43454.78	42561.44	41464.31	40280.51	39915.61	38286.42	37995.44	37458.34	36382.64	35665.78	34860.32	34591.66	34651.17	34156.54	

Air Emission Accounts in Japan (CH₄, FY2007–FY2019)

Tentative estimation
Presentation only

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
A, B	23,343	23,057	23,104	23,001	22,349	21,979	22,268	22,054	21,900	21,994	21,932	21,848	21,914
C	973	947	918	886	869	853	820	809	791	796	804	747	717
D	11	11	13	14	22	25	24	27	29	30	33	31	29
E	756	756	737	784	612	616	636	644	653	663	679	681	675
F	2,222	2,168	2,062	2,024	2,063	2,032	1,936	1,899	1,922	1,964	1,935	1,903	1,865
F33	48	43	39	42	124	137	100	95	150	221	266	257	240
F34–F36	2,174	2,125	2,023	1,982	1,939	1,895	1,836	1,804	1,772	1,743	1,669	1,645	1,624
G	0	0	0	0	0	0	0	0	0	0	0	0	0
H	159	142	134	129	124	119	115	111	107	106	102	99	95
I	0	0	0	0	0	0	0	0	0	0	0	0	0
J	0	0	0	0	0	0	0	0	0	0	0	0	0
K	0	0	0	0	0	0	0	0	0	0	0	0	0
L–N	0	0	0	0	0	0	0	0	0	0	0	0	0
M	0	0	0	0	0	0	0	0	0	0	0	0	0
O	0	0	0	0	0	0	0	0	0	0	0	0	0
P	0	0	0	0	0	0	0	0	0	0	0	0	0
Q, R	5,629	5,298	4,988	4,657	4,415	4,199	3,993	3,769	3,579	3,380	3,212	3,049	2,910
R88	5,629	5,298	4,988	4,657	4,415	4,199	3,993	3,769	3,579	3,380	3,212	3,049	2,910
Q, R89–R96	0	0	0	0	0	0	0	0	0	0	0	0	0
S, T	275	266	201	224	69	59	52	44	44	43	46	47	49
HH	239	225	218	223	216	213	202	191	182	181	190	170	172
Total Industries +Total Households	33,607	32,871	32,376	31,943	30,739	30,095	30,047	29,549	29,207	29,157	28,934	28,574	28,425
BI													
less NRA	5.909337	5.707638	5.330069	5.370287	5.448258	5.843393	6.299482	6.189025	6.839762	7.485881	7.967723	8.265693	8.368035
plus NRT	–	–	–	–	–	–	–	–	–	–	–	–	–
OTHER	–	–	–	–	–	–	–	–	–	–	–	–	–
INV-TOTAL	33600.69	32865.6	32370.91	31937.59	30734.05	30089.01	30040.85	29542.82	29199.89	29149.5	28925.75	28566.19	28416.47

CH4 trends in main 4 sectors (FY1990–FY2019)



The decrease since FY1990 is mainly result of a decrease in emission from the waste sector .

Air Emission Accounts in Japan (CO₂, FY1990–FY2006)

Tentative estimation
Presentation only

Unit: kt-CO₂e

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
A, B	11,483	11,353	11,295	11,300	11,080	10,699	10,544	10,444	10,317	10,238	10,284	10,097	10,096	10,088	9,977	10,033	10,065
C	19	18	17	19	19	18	17	16	15	14	13	12	11	10	10	9	8
D	28	28	29	34	35	35	33	32	30	28	26	25	22	21	21	19	19
E	11,500	11,099	11,128	10,998	12,203	12,199	13,288	14,024	12,654	6,509	9,065	5,682	5,566	5,607	5,787	5,292	5,488
E09	11	12	13	14	14	16	16	17	18	19	19	21	22	22	24	24	25
E11	70	68	69	76	76	75	71	73	74	69	64	60	57	56	53	44	39
E14	140	137	140	146	216	264	261	267	255	261	275	272	268	267	274	282	279
E16, E17	10,507	10,098	10,110	9,880	10,968	10,897	11,955	12,581	11,265	5,080	7,580	4,187	4,067	4,102	4,266	3,762	3,987
E21	238	240	247	298	311	316	392	498	473	483	515	532	515	526	523	589	591
E22	333	340	344	363	394	399	365	380	371	396	417	417	446	448	468	439	418
E23	73	72	72	70	67	69	64	66	65	64	62	62	61	60	52	23	22
E24–E27 other than above	102 27	105 27	106 28	120 31	124 33	128 35	131 34	106 37	94 39	96 40	94 40	91 40	91 40	88 39	88 41	90 40	90 37
F	5,815	6,022	5,945	5,856	5,875	6,408	6,395	6,582	6,428	6,377	6,275	6,367	6,216	6,050	5,890	5,920	5,746
F33	510	528	499	497	555	918	939	959	964	1,048	1,104	1,293	1,341	1,369	1,372	1,582	1,565
F34–F36	2,392	2,415	2,424	2,421	2,396	2,444	2,427	2,445	2,427	2,352	2,306	2,292	2,279	2,301	2,320	2,289	2,248
G	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H	2,913	3,079	3,021	2,939	2,924	3,046	3,029	3,177	3,037	2,977	2,865	2,782	2,596	2,380	2,198	2,049	1,932
I	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
J	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
K	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
L–N	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
O	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Q, R	1,619	1,657	1,790	1,792	1,949	2,087	2,208	2,280	2,284	2,355	2,337	2,269	2,143	2,181	2,180	2,282	2,173
R88	1,619	1,657	1,790	1,792	1,949	2,087	2,208	2,280	2,284	2,355	2,337	2,269	2,143	2,181	2,180	2,282	2,173
Q, R89–R96	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
S, T	452	468	475	492	506	536	532	560	588	607	627	645	543	532	541	545	548
HH	1,036	1,015	1,152	1,204	1,288	1,289	1,379	1,273	1,325	1,365	1,378	1,280	1,240	1,180	1,090	1,013	930
Total Industries +Total Households	31,952	31,660	31,831	31,695	32,955	33,270	34,396	35,211	33,641	27,493	30,005	26,377	25,837	25,669	25,497	25,114	24,977
BI																	
less NRA	127	130	131	128	130	135	130	137	148	146	141	132	149	143	144	143	133
plus NRT	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
OTHER	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
INV-TOTAL	31,825	31,530	31,700	31,567	32,825	33,135	34,266	35,074	33,493	27,348	29,864	26,245	25,688	25,526	25,353	24,970	24,844

Air Emission Accounts in Japan (N2O, FY2007–FY2019)

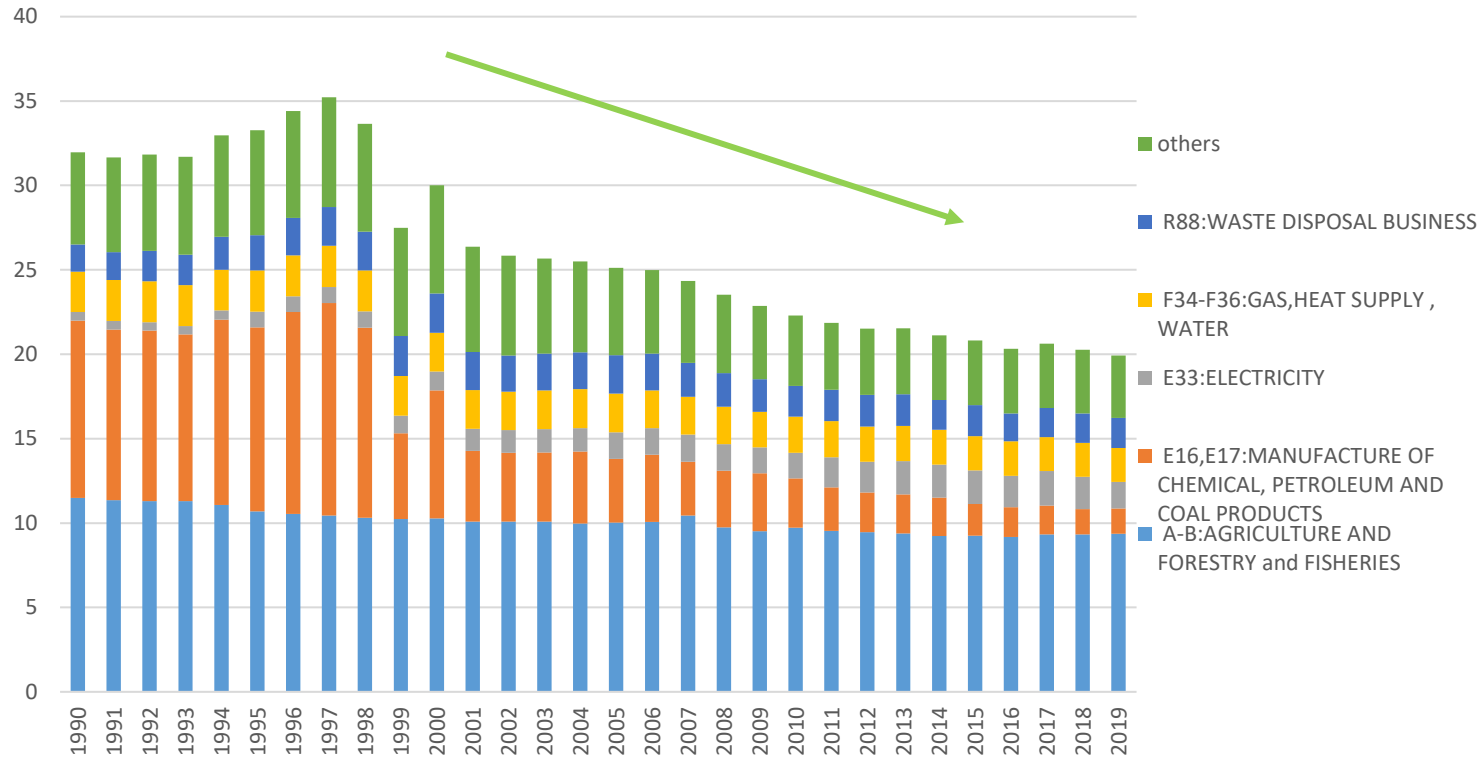
Tentative estimation
Presentation only

Unit: kt-CO2e

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
A, B	10,448	9,740	9,518	9,736	9,548	9,459	9,383	9,236	9,248	9,185	9,338	9,331	9,365
C	7	6	7	7	9	9	7	6	6	6	6	5	5
D	18	14	15	18	27	29	22	20	22	23	25	24	21
E	4,753	4,891	4,889	4,321	3,926	3,758	3,733	3,666	3,298	3,126	3,036	2,832	2,800
E09	25	23	23	23	22	22	21	21	18	17	14	17	16
E11	35	29	29	33	34	33	34	30	31	29	29	28	27
E14	282	326	334	327	327	335	350	357	361	349	343	335	304
E16, E17	3,179	3,359	3,427	2,907	2,561	2,361	2,316	2,265	1,885	1,751	1,693	1,492	1,494
E21	592	563	518	464	472	482	492	484	496	473	455	459	450
E22	503	465	435	446	361	377	395	395	401	398	397	383	403
E23	18	17	15	14	18	18	17	16	14	16	15	16	14
E24–E27	86	74	73	73	92	91	72	61	58	60	60	65	60
other than above	33	34	33	33	40	39	37	36	33	33	31	36	32
F	5,691	5,514	5,278	5,194	5,408	5,327	5,457	5,407	5,380	5,269	5,406	5,231	4,872
F33	1,615	1,581	1,538	1,520	1,785	1,816	1,962	1,970	1,986	1,857	2,047	1,912	1,573
F34–F36	2,231	2,219	2,111	2,133	2,147	2,087	2,095	2,057	2,039	2,049	2,015	2,009	2,018
G	0	0	0	0	0	0	0	0	0	0	0	0	0
H	1,845	1,714	1,628	1,540	1,477	1,425	1,400	1,379	1,355	1,362	1,344	1,310	1,282
I	0	0	0	0	0	0	0	0	0	0	0	0	0
J	0	0	0	0	0	0	0	0	0	0	0	0	0
K	0	0	0	0	0	0	0	0	0	0	0	0	0
L–N	0	0	0	0	0	0	0	0	0	0	0	0	0
M	0	0	0	0	0	0	0	0	0	0	0	0	0
O	0	0	0	0	0	0	0	0	0	0	0	0	0
P	0	0	0	0	0	0	0	0	0	0	0	0	0
Q, R	2,013	1,985	1,924	1,824	1,860	1,862	1,870	1,756	1,838	1,655	1,721	1,748	1,775
R88	2,013	1,985	1,924	1,824	1,860	1,862	1,870	1,756	1,838	1,655	1,721	1,748	1,775
Q, R89–R96	0	0	0	0	0	0	0	0	0	0	0	0	0
S, T	527	520	470	473	405	424	449	456	459	511	546	537	536
HH	876	847	759	714	674	657	615	573	565	543	558	560	559
Total Industries +Total Households	24,334	23,517	22,859	22,288	21,858	21,526	21,537	21,120	20,815	20,318	20,636	20,268	19,934
BI													
less NRA	127	127	116	114	113	121	131	128	130	139	146	139	139
plus NRT	–	–	–	–	–	–	–	–	–	–	–	–	–
OTHER	–	–	–	–	–	–	–	–	–	–	–	–	–
INV–TOTAL	24,207	23,390	22,743	22,174	21,745	21,404	21,406	20,991	20,686	20,179	20,490	20,129	19,795

N2O trend in main 5 sectors (FY1990–FY2019)

Unit: kt-CO2e



N2O emissions are mainly dependent on the operation of adipic acid production plant.

N2O is decreasing due to N2O abatement equipment from FY1998.

(From FY1999 to FY2000, N2O abatement equipment's operation rate decreased due to machine failure.)

Application and Extension

- We use AEAs to estimate Environmental Adjusted Multi-Factor Productivity (EAMFP) by industry
 1. AEAs is consistent with SNA
 2. Compilation of mid-term GHG emission data (1990-2019)
⇒ we expect to **estimate the impacts of GHG on GDP by industry.**
- Future Development
 1. Reclassification from JSIC to ISIC
to allow for international comparison on climate change issues
 2. Retroactive Estimation Period
to provide more useful econometric analysis between economics and environment
 3. Compilation of other GHG data