2015
Taiwan Greenhouse Gas Inventory
Executive Summary

February 2016

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ES.1 Background Information on National Greenhouse Gas Inventory

The guidelines in Article 4 and Article 12 of the United Nation Framework Convention on Climate Change （UNFCCC） and Article 5 of Kyoto Protocol state that each party shall submit information on its progress in response to climate change to the UNFCCC Convention of the Parties for review. In particular, the National Inventory Report （NIR） is a national report in which the UNFCCC[1] requires each Annex I country to report on its national greenhouse gas（GHG）inventory describing the procedures for GHG emission inventory preparation, information on emission trends, statistics by sectors, and a national report of re-calculation while submitting its inventory based on Common Reporting Format（CRF）. Although Taiwan is not a UNFCCC party, it has long been committed to fulfill its responsibility as a member of global community by taking initiatives to slow down global warming with arduous efforts. The establishment of a national GHG inventory report and the estimation of GHG emission and absorption is the fundamental obligation of a country to UNFCCC as well as one of the essential steps in reducing global warming.

Since 1998, Taiwan has taken initiatives to prepare the national GHG inventory. According to the Decision 24/CP.17 of 17th Convention of the Parties （COP17）of the United Nations Framework Convention on Climate Change and the 7th Session of the Conference of the Parties （CMP7）to the Kyoto Protocol which held in Durban, requesting developed countries to submit Annual National Inventory Report starting from 2015 in accordance with 2006 Intergovernmental Panel on Climate Change Guidelines （2006 IPCC Guidelines） for National Greenhouse Gas Inventories proposed by Intergovernmental Panel on Climate Change, IPCC in 2006. This Report also carried out the statistics and compilation in accordance with 2006 IPCC Guidelines to actively demonstrate the effort and resolution to abide by the convention. Today, the country has established a greenhouse gas inventory database from 1990 to 2014. The database aims to summarize the overview on greenhouse gas inventory statistics to explain the GHG trends in Taiwan. It is also to quantify future greenhouse gas emissions, to introduce

1 UNFCCC, FCCC/CP/2002/8, 2002.

Taiwan' s greenhouse gas statistics overview, and thereby to receive comments from all fields for the continuous improvement on the quality of national greenhouse gas inventories.

ES.2 Summary of National Emission and Absorption Related Trends

Taiwan's total GHG emissions increased from 136,178 Kilotons of carbon dioxide (excluding carbon dioxide removal) in 1990 up to 284,514 Kilotons of carbon dioxide equivalents (excluding carbon dioxide removal) in 2013, with emission increased by 108.93% at an average annual growth rate of 2.94%. The total emission in 2013 is increased by 0.89% than the previous year. Net greenhouse gas emission increased from 116,913 Kilotons of carbon dioxide equivalents in 1990 up to 263,445 Kilotons of carbon dioxide equivalents in 2013, with emissions increased by 125.33%, at an average annual growth rate of 3.16%. The total emissions in 2013 are increased by 0.96% than the previous year, as shown in Figure ES2.1. Further comparison of statistics on various greenhouse gas emissions shows that carbon dioxide accounts for the majority of greenhouse gas emissions in Taiwan in 2013, followed by methane, nitrous oxide and then fluorinated greenhouse gas. Between 1990 and 2013, carbon dioxide emissions grew by 120.25%, increasing at an average annual growth rate of 3.16%; methane emission decreased by 45.53% with an average annual growth rate of -2.71%,

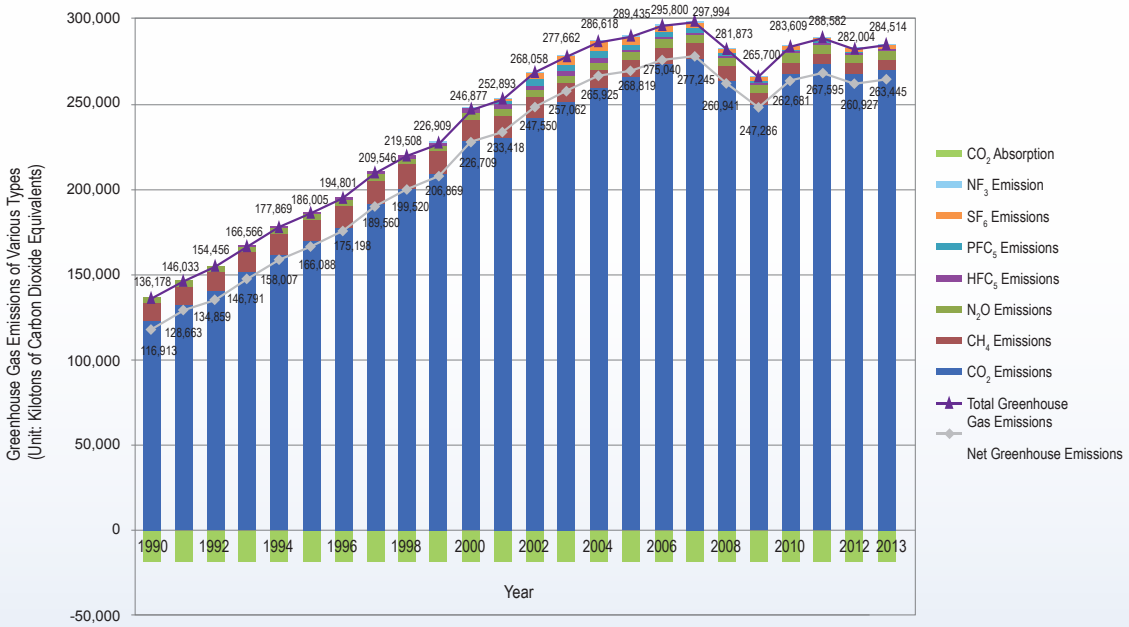

Figure ES2.1 Taiwan Greenhouse Gas Emissions Trends from Year 1990 to 2013

Table ES2.1 Taiwan Greenhouse Gas Emission Inventories from Year 1990 to 2013 By Gas Type

(Unit: Kilotons of Carbon Dioxide Equivalents)

Year	CO_2	CO_2 Absorption	CH_4	N_2O	HFCs	PFCs	SF_6	NF_3	Net GHG	Total GHG
1990	122,419	-19,265	10,882	2,878	NE	NE	NE	NE	116,913	136,179
1991	131,754	-17,370	11,157	3,122	NE	NE	NE	NE	128,663	146,033
1992	140,117	-19,597	11,207	3,133	NE	NE	NE	NE	134,859	154,456
1993	151,012	-19,775	11,603	3,196	755	NE	NE	NE	146,791	166,566
1994	161,399	-19,862	12,364	3,251	855	NE	NE	NE	158,007	177,869
1995	168,770	-19,917	13,108	3,326	801	NE	NE	NE	166,088	186,005
1996	176,702	-19,603	13,539	3,254	1,305	NE	NE	NE	175,198	194,801
1997	191,215	-19,986	13,559	3,294	1,477	NE	NE	NE	189,560	209,546
1998	200,607	-19,988	13,579	3,240	2,083	NE	NE	NE	199,520	219,508
1999	208,265	-20,040	13,705	3,201	1,609	3	116	11	206,869	226,909
2000	227,109	-20,168	13,490	3,816	2,319	13	120	10	226,709	246,877
2001	229,720	-19,475	12,646	3,988	2,619	2,939	746	235	233,418	252,893
2002	241,262	-20,508	12,029	4,097	2,216	4,143	3,914	398	247,550	268,058
2003	250,527	-20,600	11,493	4,122	2,397	4,198	4,385	540	257,062	277,662
2004	258,935	-20,693	10,760	4,279	2,451	4,341	5,193	659	265,925	286,618
2005	265,308	-20,616	10,258	4,320	1,070	3,070	4,683	726	268,819	289,435
2006	272,959	-20,760	9,584	4,766	987	3,264	3,590	650	275,040	295,800
2007	276,169	-20,749	9,063	4,863	1,093	2,933	3,114	759	277,245	297,994
2008	263,532	-20,932	8,345	4,457	1,046	1,682	2,644	166	260,941	281,873
2009	248,562	-18,414	7,682	4,618	980	1,143	2,176	538	247,286	265,700
2010	266,839	-20,928	7,092	5,017	934	1,354	2,155	219	262,681	283,609
2011	272,485	-20,987	6,676	4,905	1,016	1,365	1,755	381	267,595	288,582
2012	267,277	-21,077	6,321	4,816	869	725	1,647	349	260,927	282,004
2013	269,627	-21,069	5,927	4,594	981	929	1,722	734	263,445	284,514

Source: NE (not estimated), refers to the exclusion of estimation on existing emissions and removals.

as negative growth; nitrous oxide emission increased by 59.64% with an annual growth rate of 1.69%, as shown in Table ES2.1.

Energy sector, industrial process sector, Energy sector, industrial processes and product use sector, agriculture sector, and waste sector are the main emission sources of carbon dioxide in Taiwan, as shown in Table ES2.2. In 1990, Taiwan had carbon dioxide emission of 122,419 Kilotons of carbon dioxide equivalents. In 2013, the figure was 269,627 Kilotons of carbon dioxide equivalent, with an increase by 120.25% and an average annual growth rate of 3.16%. In 2013 alone, energy sector accounted for 92.39%, industrial processes and product use sector 7.59%, agriculture sector 0.02%, and waste sector 0.002%. The emission in 2013 compared with 2012 was increased by 0.88%, mainly because of the increase in emission by 0.19% in energy sector and 10.56% in industrial processes and product use sector and the decrease in emission by 17.45% in agriculture sector and 92.67% in waste sector.

The main methane emission in Taiwan is from the agricultural sector, waste sector, and energy sector, as shown in Table ES2 .3. In 1990, total methane emission in Taiwan was 10,882 Kilotons of carbon dioxide equivalents. In 2013, total methane emission was 5,927 Kilotons of carbon dioxide equivalents, down by 45.53% with an average growth rate of -2.71%. In particular, waste sector is the largest source for methane emission, responsible for 69.23%, followed by agricultural sector 22.00%, energy sector 8.13%, and industrial processes and product use sector 0.63%. Compared to 2012, the 2013 methane emission was down by 6.23%, with energy sector up by 0.83%, industrial process and product use sector up by 7.81%, agriculture sector up by 0.31%, and waste sector down by 8.98%.

The main nitrous oxide emission in Taiwan is from the industrial processes and product use sector, agricultural sector, and energy sector with minor emissions from the waste sector, as shown in Table ES2.4. In 1990, total nitrous oxide emission in Taiwan was 2,878 Kilotons of carbon dioxide equivalents. In 2013, total nitrous oxide emission was 4,594 Kilotons of carbon dioxide equivalents, up by 59.61% with an average growth rate of 1.69%. In particular, the industrial processes and product use sector is the largest source for nitrous oxide in Taiwan in 2013, responsible for 33.50%, followed by agriculture sector 32.41%, energy sector 26.71%, and waste sector 7.38%. Compared to 2012, the 2013 nitrous oxide emission was down by 4.61%, with industrial process and product use sector down by 8.05% （most substantial decrease）, agriculture sector dropped by 5.22%, energy sector down

Table ES2.2 Taiwan Greenhouse Gas Emission Inventories from Year 1990 to 2013 by Sector

(Unit: Kilotons of Carbon Dioxide Equivalents)

Source \ Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
1. Energy Sector	109,491	118,414	126,056	135,212	142,982	150,437	158,104	170,599	181,294	190,260	209,364	213,039
1.A.1. Energy Industry	49,118	55,403	58,795	66,180	70,862	76,800	81,519	92,436	100,959	107,029	122,157	126,437
1.A.2. Manufacturing Industry and Construction	30,154	31,656	33,121	33,405	34,380	34,996	36,051	37,818	38,551	39,854	43,064	42,158
1.A.3. Transportation	19,646	20,888	24,033	26,103	27,540	28,822	29,801	30,536	31,844	32,772	33,207	33,246
1.A.4. Other Sectors	10,572	10,466	10,107	9,523	10,200	9,820	10,733	9,809	9,940	10,605	10,937	11,198
1.A.4.a Commerce (Service Industry)	3,621	3,529	2,989	2,490	3,018	2,445	3,175	2,483	2,948	3,155	3,220	3,562
1.A.4.b Residential	4,005	4,238	4,446	4,359	4,461	4,597	4,754	4,851	4,952	5,410	5,354	5,181
1.A.4.c Agriculture, Forestry, Fishery, and Husbandry	2,946	2,700	2,672	2,675	2,721	2,777	2,805	2,475	2,041	2,040	2,362	2,455
2. Industrial Processes and Product Use Sector	12,766	13,186	13,857	15,606	18,172	17,784	18,061	20,378	19,069	17,822	17,355	16,047
2.A. Mining Industry (Non-Metal Process)	8,546	8,547	9,500	10,729	13,257	12,659	12,663	13,412	11,581	10,762	9,582	7,856
2.B. Chemical Industry	563	539	565	609	762	850	992	1,020	1,003	1,075	1,143	1,232
2.C. Metal Process	3,655	4,098	3,789	4,265	4,151	4,273	4,404	5,945	6,483	5,983	6,628	6,957
2.H. Others	2.05	2.03	1.99	2.08	2.05	1.87	1.75	1.66	1.91	1.83	1.78	1.75
3. Agriculture Sector	142	146	139	131	135	151	151	134	127	118	131	94
4. Land Use and Forestry Sector	-19,265	-17,370	-19,597	-19,775	-19,862	-19,917	-19,603	-19,986	-19,988	-20,040	-20,168	-19,475
5. Waste Sector	20	8	65	63	110	398	387	105	117	65	259	540
Net Greenhouse Gas Emission	103,154	114,384	120,520	131,237	141,537	148,853	157,099	171,229	180,619	188,225	206,941	210,245
Total Greenhouse Gas Emission	122,419	131,754	140,117	151,012	161,399	168,770	176,702	191,215	200,607	208,265	227,109	229,720

Source \ Year	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
1. Energy Sector	221,092	230,675	238,513	245,202	252,068	255,869	244,632	232,181	248,276	253,446	248,637	249,108
1.A.1. Energy Industry	130,556	140,966	146,638	153,821	160,602	164,426	158,464	148,914	159,910	163,547	161,112	160,239
1.A.2. Manufacturing Industry and Construction	44,935	43,559	43,974	42,654	43,945	45,866	42,388	39,556	43,660	44,894	43,253	44,562
1.A.3. Transportation	34,542	34,509	35,859	36,844	36,769	35,415	33,394	33,711	34,824	35,293	34,502	34,472
1.A.4. Other Sectors	11,058	11,641	12,041	11,883	10,752	10,162	10,387	9,999	9,881	9,712	9,769	9,835
1.A.4.a Commerce (Service Industry)	3,493	3,961	4,118	4,233	4,248	4,192	4,201	4,226	4,203	3,961	3,958	4,177
1.A.4.b Residential	5,107	4,869	4,947	5,023	4,857	4,879	4,820	4,775	4,737	4,814	4,770	4,649
1.A.4.c Agriculture, Forestry, Fishery, and Husbandry	2,459	2,811	2,977	2,626	1,646	1,091	1,365	998	941	937	1,041	1,009
2. Industrial Processes and Product Use Sector	19,465	19,352	19,826	19,695	20,362	19,681	18,401	16,171	18,301	18,871	18,525	20,469
2.A. Mining Industry (Non-Metal Process)	10,762	10,505	11,023	11,637	11,332	10,276	9,271	8,363	8,396	9,591	9,170	9,880
2.B. Chemical Industry	1,313	1,384	1,485	1,552	1,530	1,654	1,457	1,514	1,599	1,637	1,503	1,572
2.C. Metal Process	7,388	7,461	7,316	6,505	7,498	7,748	7,671	6,292	8,305	7,641	7,850	9,016
2.H. Others	1.60	1.61	1.70	1.74	1.85	1.77	1.73	1.83	1.74	1.69	1.82	1.70
3. Agriculture Sector	93	82	84	62	59	57	57	55	54	53	55	45
4. Land Use and Forestry Sector	-20,508	-20,600	-20,693	-20,616	-20,760	-20,749	-20,932	-18,414	-20,928	-20,987	-21,077	-21,069
5. Waste Sector	612	417	512	348	470	562	443	154	208	115	61	4
Net Greenhouse Gas Emission	220,754	229,927	238,242	244,692	252,199	255,420	242,600	230,148	245,911	251,498	246,200	248,558
Total Greenhouse Gas Emission	241,262	250,527	258,935	265,308	272,959	276,169	263,532	248,562	266,839	272,485	267,277	269,627

Table ES2.3 Methane Emission Inventories for Taiwan from Year 1990 to 2013

(Unit: Kilotons of Carbon Dioxide Equivalents)

Source \ Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
1. Energy Sector	254	270	293	310	328	344	359	370	390	409	430	435
2. Industrial Processes and Product Use Sector	5	7	6	7	8	10	11	12	10	12	14	23
3. Agriculture Sector	1,873	1,901	1,864	1,863	1,832	1,855	1,839	1,723	1,623	1,644	1,618	1,565
3.A. Livestock Gastrointestinal Fermentation	670	731	738	775	789	822	822	732	674	694	692	660
3.B. Livestock Waste Treatment	206	236	234	240	247	259	266	219	192	205	210	201
3.C. Rice Culturing	960	909	845	825	775	767	745	765	751	738	702	689
3.F. Agricultural Waste Burning (Crop Burning)	38	25	48	22	21	7	7	7	6	7	14	15
5. Waste Sector	8,750	8,980	9,044	9,423	10,196	10,899	11,329	11,454	11,556	11,640	11,429	10,624
5.A. Garbage Landfill	5,832	5,917	5,928	6,323	7,061	7,719	8,080	8,212	8,372	8,596	8,512	7,732
5.B. Garbage Biological Treatment	11	1	1	0	0	1	0	1	0	2	0	0
5.D. Waste Water Treatment	2,907	3,062	3,115	3,100	3,135	3,179	3,249	3,241	3,184	3,042	2,916	2,891
Total	10,882	11,157	11,207	11,603	12,364	13,108	13,539	13,559	13,579	13,705	13,490	12,646
Source \ Year	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
1. Energy Sector	447	465	482	488	488	491	473	462	478	485	478	482
2. Industrial Processes and Product Use Sector	24	26	33	33	29	39	38	33	36	27	35	38
3. Agriculture Sector	1,479	1,394	1,320	1,387	1,368	1,341	1,299	1,282	1,274	1,301	1,300	1,304
3.A. Livestock Gastrointestinal Fermentation	636	626	614	623	614	609	584	571	578	590	583	579
3.B. Livestock Waste Treatment	194	192	193	195	195	185	180	175	176	180	172	166
3.C. Rice Culturing	637	567	505	561	551	543	529	530	514	526	540	555
3.F. Agricultural Waste Burning (Crop Burning)	13	9	8	8	8	5	6	5	5	5	5	3
5. Waste Sector	10,079	9,607	8,926	8,350	7,699	7,192	6,535	5,906	5,304	4,863	4,508	4,103
5.A. Garbage Landfill	7,214	6,675	6,101	5,525	4,930	4,379	3,814	3,246	2,749	2,352	1,997	1,688
5.B. Garbage Biological Treatment	0	2	7	10	11	14	16	18	21	26	24	23
5.D. Waste Water Treatment	2,864	2,930	2,818	2,815	2,757	2,798	2,705	2,642	2,535	2,485	2,486	2,392
Total	12,029	11,493	10,760	10,258	9,584	9,063	8,345	7,682	7,092	6,676	6,321	5,927

Table ES2.4 Nitrous Oxide Emission Inventories for Taiwan from Year 1990 to 2013

(Unit: Kilotons of Carbon Dioxide Equivalents)

Source \ Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
1. Energy Sector	537	578	652	703	739	772	816	861	912	961	1,047	1,070
1.A.1. Energy Industry	138	158	183	207	221	239	267	302	332	364	432	453
1.A.2. Manufacturing Industry and Construction	91	94	100	99	101	101	105	107	111	113	125	127
1.A.3. Transportation	291	309	353	382	402	418	428	438	456	469	475	475
1.A.4 Other Sectors	17	17	15	14	15	14	16	14	14	14	15	16
2. Industrial Processes and Product Use Sector	166	352	325	301	318	345	186	374	383	312	625	800
3. Agriculture Sector	1,880	1,908	1,857	1,881	1,881	1,874	1,915	1,723	1,624	1,599	1,813	1,778
3.B Livestock Waste Treatment	48	50	52	54	59	61	67	70	71	72	73	71
3.D Agricultural Soil	1,820	1,850	1,791	1,821	1,815	1,810	1,846	1,651	1,551	1,524	1,736	1,702
3.F Agricultural Waste Burning (Crop Burning)	12	8	15	7	6	2	2	2	2	2	4	5
5. Waste Sector	296	285	298	311	313	334	337	337	321	329	331	340
Total	2,878	3,122	3,133	3,196	3,251	3,326	3,254	3,294	3,240	3,201	3,816	3,988
Source \ Year	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
1. Energy Sector	1,124	1,175	1,215	1,251	1,283	1,294	1,238	1,200	1,237	1,253	1,232	1,227
1.A.1. Energy Industry	475	529	549	576	604	624	604	573	581	583	578	569
1.A.2. Manufacturing Industry and Construction	137	133	135	132	137	149	139	131	144	151	144	148
1.A.3. Transportation	496	495	513	527	527	508	481	483	500	507	498	498
1.A.4 Other Sectors	16	17	18	17	15	13	14	13	12	12	12	12
2. Industrial Processes and Product Use Sector	833	923	926	1,047	1,428	1,542	1,301	1,466	1,834	1,762	1,674	1,539
3. Agriculture Sector	1,793	1,672	1,796	1,672	1,704	1,666	1,590	1,625	1,609	1,546	1,571	1,489
3.B Livestock Waste Treatment	70	71	69	71	72	71	72	71	70	71	71	71
3.D Agricultural Soil	1,718	1,598	1,724	1,599	1,630	1,594	1,517	1,553	1,536	1,474	1,499	1,417
3.F Agricultural Waste Burning (Crop Burning)	4	3	2	2	3	1	2	2	2	2	2	1
5. Waste Sector	348	353	343	350	351	360	328	327	337	344	339	339
Total	4,097	4,122	4,279	4,320	4,766	4,863	4,457	4,618	5,017	4,905	4,816	4,594

by 0.36%, and waste sector down by 0.16%.

In Taiwan, the majority of fluorinated greenhouse gases come from economically critical industries, including the semiconductor, optoelectronics, power facilities, and magnesium alloy, which are emission-heavy industries. The fluorinated greenhouse gas emissions are shown in Table ES2.5. In particular, the emission from Taiwan's HFCs decreased from 755 kilotons of carbon dioxide equivalents in 1993 to 981 kilotons of carbon dioxide equivalents in 2013. The emission from PFCs decreased from 3 kilotons of carbon dioxide equivalents in 1999 to 929 kilotons of carbon dioxide equivalents in 2013; while the emission from SF_6 increased from 116 kilotons of carbon dioxide equivalents in 1999 to 1,722 kilotons of carbon dioxide equivalents in 2013. The emission from NF_3 increased from 11 kilotons of carbon dioxide equivalents in 1999 to 734 kilotons of carbon dioxide equivalents in 2013. For total emission of fluorinated greenhouse gases, it decreased from 1,738 kilotons of carbon dioxide equivalents in 1999 (about 0.77% of total greenhouse gas emission for 1999) to 4,365 kilotons of carbon dioxide equivalents in 2013 (about 1.53% of total greenhouse gas emission for 2013), with emissions increased by 151.12%. Compared to 2012, the 2013 emission increased by 21.61%.

Table ES2.5 Fluorinated Greenhouse Gas Emissions for Taiwan from Year 1993 to 2013

(Unit: Kilotons of Carbon Dioxide Equivalents)

Gas \ Year	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Total HFCs Emissions	755	855	801	1,305	1,477	2,083	1,609	2,319	2,619	2,216	2,397	2,451
Total PFCs Emissions	NE	NE	NE	NE	NE	NE	3	13	2,939	4,143	4,198	4,341
Total SF_6 Emissions	NE	NE	NE	NE	NE	NE	116	120	746	3,914	4,385	5,193
Total Emissions NF_3	NE	NE	NE	NE	NE	NE	11	10	235	398	540	659
Total Emissions	755	855	801	1,305	1,477	2,083	1,738	2,462	6,538	10,671	11,520	12,643
Gas \ Year	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**			
Total HFCs Emissions	1,070	987	1,093	1,046	980	934	1,016	869	981			
Total PFCs Emissions	3,070	3,264	2,933	1,682	1,143	1,354	1,365	725	929			
Total SF_6 Emissions	4,683	3,590	3,114	2,644	2,176	2,155	1,755	1,647	1,722			
Total Emissions NF_3	726	650	759	166	538	219	381	349	734			
Total Emissions	9,549	8,490	7,900	5,538	4,838	4,661	4,516	3,589	4,365			

Source: NE (not estimated), refers to the exclusion of estimation on existing emissions and removals.

ES.3 Emission Statistics and Trends Analysis on Emission Source and Absorption Categories

The energy sector, among all segments, has long been the one accounting for the largest total greenhouse gas emissions in Taiwan over the years. The GHG emission for the energy sector was responsible for approximately 88.16% of the total emissions in 2013 (excluding land use and forestry absorption), the industrial processes and product use sector 9.28%, agriculture sector 1.00%, and the waste sector 1.56%. The GHG emission and trends for Taiwan from year 1990 to 2013 by sector are shown in Figure ES3.1 and Table ES3.1. Between 1990 and 2013, the GHS emissions from energy sector increased by 127.43% with an average annual growth rate of 3.29%, the industrial processes and product use sector increased by 104.15% with an average growth rate of 2.95%, the agriculture sector decreased by 27.10% with an average annual growth rate of -1.43%, a negative growth. The GHG emissions from waste sector decreased by 50.95% with an average annual growth rate of -9.36%, a negative growth while the GHG emission absorption for land use and forestry sector decreased by 9.36% with an average annual growth rate of 0.84%. The total greenhouse gas emission for Taiwan in 2013 was dropped by

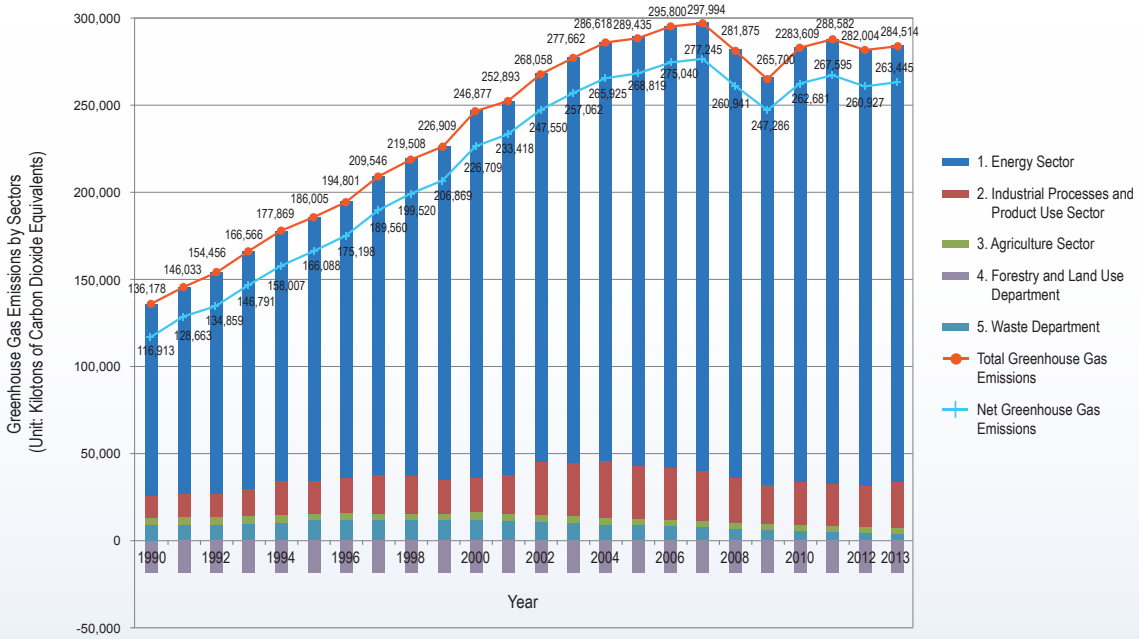

Figure ES3.1 Various Greenhouse Gas Emission Trends for Taiwan from Year 1990 to 2013 by Sector

Table ES3.1 Greenhouse Gas Emissions for Taiwan from Year 1990 to 2013 by Sector

(Unit: Kilotons of Carbon Dioxide Equivalents)

Source \ Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
1. Energy Sector	110,281	119,261	127,001	136,225	144,050	151,553	159,279	171,829	182,597	191,630	210,842	214,544
2. Industrial Processes and Product Use Sector	12,937	13,544	14,188	16,669	19,352	18,940	19,563	22,242	21,545	19,884	20,455	23,408
3. Agriculture Sector	3,894	3,955	3,860	3,875	3,848	3,880	3,905	3,579	3,374	3,361	3,562	3,437
4. Land Use and Forestry Sector	9,066	9,273	9,407	9,798	10,619	11,631	12,053	11,896	11,993	12,035	12,018	11,504
5. Waste Sector	-19,265	-17,370	-19,597	-19,775	-19,862	-19,917	-19,603	-19,986	-19,988	-20,040	-20,168	-19,475
Net Greenhouse Gas Emission (Including Land Use Change and Forestry Absorption)	116,913	128,663	134,859	146,791	158,007	166,088	175,198	189,560	199,520	206,869	226,709	233,418
Total Greenhouse Gas Emission (Excluding Land Use Change and Forestry Absorption)	136,178	146,033	154,456	166,566	177,869	186,005	194,801	209,546	219,508	226,909	246,877	252,893
Source \ Year	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
1. Energy Sector	222,662	232,315	240,210	246,942	253,839	257,654	246,342	233,843	249,991	255,184	250,347	250,817
2. Industrial Processes and Product Use Sector	30,992	31,821	33,428	30,325	30,310	29,162	25,278	22,508	24,832	25,176	23,823	26,411
3. Agriculture Sector	3,365	3,148	3,199	3,122	3,132	3,065	2,946	2,962	2,937	2,900	2,926	2,839
4. Land Use and Forestry Sector	11,039	10,377	9,781	9,047	8,519	8,114	7,306	6,387	5,849	5,322	4,908	4,447
5. Waste Sector	-20,508	-20,600	-20,693	-20,616	-20,760	-20,749	-20,932	-18,414	-20,928	-20,987	-21,077	-21,069
Net Greenhouse Gas Emission (Including Land Use Change and Forestry Absorption)	247,550	257,062	265,925	268,819	275,040	277,245	260,941	247,286	262,681	267,595	260,927	263,445
Total Greenhouse Gas Emission (Excluding Land Use Change and Forestry Absorption)	268,058	277,662	286,618	289,435	295,800	297,994	281,873	265,700	283,609	288,582	282,004	284,514

0.89%, compared to that in 2012. In particular, the GHG emission from energy sector was up by 0.19%, industrial processes and product use sector up by 10.87%, agriculture sector down by 3.00%, and the waste sector down by 9.41%. Additionally, the carbon dioxide absorption of land use change and forestry sector was down by 0.04%.

The total greenhouse gas emission from the energy sector in 1990 was 110,281 kilotons of carbon dioxide equivalents and increased to 250,817 kilotons of carbon dioxide equivalents in 2013 with an average growth by 127.43% and annual average growth of 3.29%, as shown in ES3.2. During this period, the greenhouse gas emission from the energy sector showed a downward trend in 2008 for the first time

Table ES3.2 Greenhouse Gas Emission from Energy Sector for Taiwan from Year 1990 to 2013

(Unit: Kilotons of Carbon Dioxide Equivalents)

Source \ Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Total Carbon Dioxide Emission	109,491	118,414	126,056	135,212	142,982	150,437	158,104	170,599	181,294	190,260	209,364	213,039
1.A.1. Energy Industry	49,118	55,403	58,795	66,180	70,862	76,800	81,519	92,436	100,959	107,029	122,157	126,437
1.A.2. Manufacturing Industry and Construction	30,154	31,656	33,121	33,405	34,380	34,996	36,051	37,818	38,551	39,854	43,064	42,158
1.A.3. Transportation	19,646	20,888	24,033	26,103	27,540	28,822	29,801	30,536	31,844	32,772	33,207	33,246
1.A.4. Others	10,572	10,466	10,107	9,523	10,200	9,820	10,733	9,809	9,940	10,605	10,937	11,198
Total CH_4 Emission	254	270	293	310	328	344	359	370	390	409	430	435
1.A.1. Energy Industry	26	29	28	31	33	38	37	44	50	57	66	67
1.A.2. Manufacturing Industry and Construction	46	48	51	51	52	52	53	54	57	57	64	66
1.A.3. Transportation	152	163	187	202	216	228	239	245	257	266	270	272
1.A.4. Others	30	29	28	26	28	27	29	26	27	28	29	30
Total N_2O Emission	537	578	652	703	739	772	816	861	912	961	1,047	1,070
1.A.1. Energy Industry	138	158	183	207	221	239	267	302	332	364	432	453
1.A.2. Manufacturing Industry and Construction	91	94	100	99	101	101	105	107	111	113	125	127
1.A.3. Transportation	291	309	353	382	402	418	428	438	456	469	475	475
1.A.4. Others	17	17	15	14	15	14	16	14	14	14	15	16
Total Emission from Energy Sector	110,281	119,261	127,001	136,225	144,050	151,553	159,279	171,829	182,597	191,630	210,842	214,544
Source \ Year	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
Total Carbon Dioxide Emission	221,092	230,675	238,513	245,202	252,068	255,869	244,632	232,181	248,276	253,446	248,637	249,108
1.A.1. Energy Industry	130,556	140,966	146,638	153,821	160,602	164,426	158,464	148,914	159,910	163,547	161,112	160,239
1.A.2. Manufacturing Industry and Construction	44,935	43,559	43,974	42,654	43,945	45,866	42,388	39,556	43,660	44,894	43,253	44,562
1.A.3. Transportation	34,542	34,509	35,859	36,844	36,769	35,415	33,394	33,711	34,824	35,293	34,502	34,472
1.A.4. Others	11,058	11,641	12,041	11,883	10,752	10,162	10,387	9,999	9,881	9,712	9,769	9,835
Total CH_4 Emission	447	465	482	488	488	491	473	462	478	485	478	482
1.A.1. Energy Industry	68	78	83	84	89	95	95	85	89	89	90	91
1.A.2. Manufacturing Industry and Construction	71	70	71	69	73	79	75	70	78	82	79	82
1.A.3. Transportation	278	287	295	303	298	289	276	281	285	288	284	284
1.A.4. Others	30	32	33	32	29	27	27	26	26	25	25	25
Total N_2O Emission	1,124	1,175	1,215	1,251	1,283	1,294	1,238	1,200	1,237	1,253	1,232	1,227
1.A.1. Energy Industry	475	529	549	576	604	624	604	573	581	583	578	569
1.A.2. Manufacturing Industry and Construction	137	133	135	132	137	149	139	131	144	151	144	148
1.A.3. Transportation	496	495	513	527	527	508	481	483	500	507	498	498
1.A.4. Others	16	17	18	17	15	13	14	13	12	12	12	12
Total Emission from Energy Sector	222,662	232,315	240,210	246,942	253,839	257,654	246,342	233,843	249,991	255,184	250,347	250,817

and declined again in 2009, followed by more reduction in 2012. The total greenhouse gas emission from the energy sector in 2013 accounted for 88.16% of total greenhouse gas emissions in Taiwan. In particular, 1.A.1 "energy industry" was responsible for 160,898 kilotons of carbon dioxide equivalents, accounting for 64.15% of the total greenhouse gas emission from the energy sector. 1.A.2 "manufacturing industry and construction" was responsible for 44,792 kilotons of carbon dioxide equivalents（accounting for 17.86%）. 1.A.3 "transportation" was responsible for 35,254 kilotons of carbon dioxide equivalents（accounting for 14.06%）, and finally 1.A.4 "Others"（including commerce（Service Industry）, residential, and agriculture/forestry/fishery） was responsible for 9,872 kilotons of carbon dioxide equivalents（accounting for 3.94%）.

The greenhouse gas emission from the industrial processes and product use sector in 1990 was 12,937 kilotons of carbon dioxide equivalents and increased to 26,411 in 2013 with an average growth by 104.15% and annual average growth of 2.95%, as shown in Table ES3.3. The total greenhouse gas emission in 2013 accounted approximately for 9.28% of the total greenhouse gas emissions in Taiwan. In particular, 2.A "Mining industry（non-metal process）"was responsible for 9,880 kilotons of carbon dioxide equivalents, accounting for 37.41% of the greenhouse gas from industrial process sector, followed by 2.C. "metal process" responsible for 9.071 kilotons of carbon dioxide equivalents（accounting for 34.35%）, 2.E. "Electronics" responsible for 4,115 kilotons of carbon dioxide equivalents（accounting for 15.58%）, 2.B. "Chemical industry" responsible for 2,389 kilotons of carbon dioxide equivalents（accounting for 9.05%）, 2.F. "Alternatives to ozone-depleting substances" responsible for 812 kilotons of carbon dioxide equivalents（accounting for 3.07%）, 2.G. "Manufacturing and use of other products" responsible for 142 kilotons of carbon dioxide equivalents（accounting for 0.54%）, and 2.H. "Others" responsible for 2 kilotons of carbon dioxide equivalents（accounting for 0.01%）.

In 2013, greenhouse gas emissions from the agricultural sector totaled 2,839 kilotons of carbon dioxide equivalents, accounting for 1.00% of total greenhouse gas emission in Taiwan, approximately down by 27.10% when compared to that in 1990, with an average annual growth rate of -1.43%, as shown in Table ES3.4. The greenhouse gas emission from the agriculture sector in 2013 was down by 2.99%, compared to that in 2012. In particular, 3.D. Nitrous dioxide emission from "agricultural soil" accounted for

Table ES3-3 Greenhouse Gas Emission from Industrial Processes and Product Use Sector for Taiwan from Year 1990 to 2013

(Unit: Kilotons of Carbon Dioxide Equivalents)

Source \ Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Total CO_2 Emission	12,766	13,186	13,857	15,606	18,172	17,784	18,061	20,378	19,069	17,822	17,355	16,047
2.A. Mining Industry (Non-Metal Process)	8,546	8,547	9,500	10,729	13,257	12,659	12,663	13,412	11,581	10,762	9,582	7,856
2.B. Chemical Industry	563	539	565	609	762	850	992	1,020	1,003	1,075	1,143	1,232
2.C. Metal Process	3,655	4,098	3,789	4,265	4,151	4,273	4,404	5,945	6,483	5,983	6,628	6,957
2.H. Others	2	2	2	2	2	2	2	2	2	2	2	2
Total CH_4 Emission	5	7	6	7	8	10	11	12	10	12	14	23
Total N_2O Emission	166	352	325	301	318	345	186	374	383	312	625	800
2.B. Chemical Industry	166	352	325	301	318	345	186	374	383	312	625	714
2.C. Metal Process	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	86
2.E Electronics	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Total HFCs Emission	NE	NE	NE	755	855	801	1,305	1,477	2,083	1,609	2,319	2,619
2.B. Chemical Industry	NE	NE	NE	755	855	801	1,305	1,477	2,083	1,609	2,319	2,567
2.E. Electronics	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	51
2.F. Alternatives to Ozone-Depleting Substances	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Total PFCs Emission (2.E Electronics)	NE	NE	NE	NE	NE	NE	NE	NE	NE	3	13	2,939
Total SF_6 Emission	NE	NE	NE	NE	NE	NE	NE	NE	NE	116	120	746
2.C. Metal Process	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
2.E. Electronics	NE	NE	NE	NE	NE	NE	NE	NE	NE	116	120	746
2.G. Manufacturing and Use of Other Products	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Total NF_3 Emission (2.E Electronics)	NE	NE	NE	NE	NE	NE	NE	NE	NE	11	10	235
Total Emission from Industrial Processes and Product Use Sector	12,937	13,544	14,188	16,669	19,352	18,940	19,563	22,242	21,545	19,884	20,455	23,408

Source \ Year	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Total CO_2 Emission	19,465	19,352	19,826	19,695	20,362	19,681	18,401	16,171	18,301	18,871	18,525	20,469
2.A. Mining Industry (Non-Metal Process)	10,762	10,505	11,023	11,637	11,332	10,276	9,271	8,363	8,396	9,591	9,170	9,880
2.B. Chemical Industry	1,313	1,384	1,485	1,552	1,530	1,654	1,457	1,514	1,599	1,637	1,503	1,572
2.C. Metal Process	7,388	7,461	7,316	6,505	7,498	7,748	7,671	6,292	8,305	7,641	7,850	9,016
2.H. Others	2	2	2	2	2	2	2	2	2	2	2	2
Total CH_4 Emission	24	26	33	33	29	39	38	33	36	27	35	38
Total N_2O Emission	833	923	926	1,047	1,428	1,542	1,301	1,466	1,834	1,762	1,674	1,539
2.B. Chemical Industry	743	831	834	960	969	996	784	1,006	1,170	1,195	1,016	780
2.C. Metal Process	90	92	92	86	91	107	101	85	119	NE	NE	NE
2.E Electronics	NE	NE	NE	NE	369	439	416	375	546	568	658	759
Total HFCs Emission	2,216	2,397	2,451	1,070	987	1,093	1,046	980	934	1,016	869	981
2.B. Chemical Industry	2,157	1,937	1,710	NE	NE	NE	NE	NE	NE	NE	NE	NE
2.E. Electronics	59	59	59	73	91	171	118	168	164	134	86	169
2.F. Alternatives to Ozone-Depleting Substances	NE	401	682	996	896	922	928	812	770	881	783	812
Total PFCs Emission (2.E Electronics)	4,143	4,198	4,341	3,070	3,264	2,933	1,682	1,143	1,354	1,365	725	929
Total SF_6 Emission	3,914	4,385	5,193	4,683	3,590	3,114	2,644	2,176	2,155	1,755	1,647	1,722
2.C. Metal Process	1,027	1,027	1,357	1,063	770	440	144	235	212	134	109	55
2.E. Electronics	944	1,415	1,783	2,117	2,050	1,721	1,605	1,239	1,648	1,339	1,352	1,524
2.G. Manufacturing and Use of Other Products	1,943	1,943	2,053	1,503	770	953	895	703	295	282	186	142
Total NF_3 Emission (2.E Electronics)	398	540	659	726	650	759	166	538	219	381	349	734
Total Emission from Industrial Processes and Product Use Sector	30,992	31,821	33,428	30,325	30,310	29,162	25,278	22,508	24,832	25,176	23,823	26,411

Note: NE（not yet estimated）, excluding estimation on existing emission sources and removal.

Table ES3.4 Greenhouse Gas Emission from Agriculture Sector for Taiwan from Year 1990 to 2013

(Unit: Kilotons of Carbon Dioxide Equivalents)

Source \ Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Total CO_2 Emission	142	146	139	131	135	151	151	134	127	118	131	94
Total CH_4 Emission	1,873	1,901	1,864	1,863	1,832	1,855	1,839	1,723	1,623	1,644	1,618	1,565
3.A Livestock Gastrointestinal Fermentation	670	731	738	775	789	822	822	732	674	694	692	660
3.B Livestock Waste Treatment	206	236	234	240	247	259	266	219	192	205	210	201
3.C Rice Culturing	960	909	845	825	775	767	745	765	751	738	702	689
3.F Agricultural Waste Burning (Crop Burning)	38	25	48	22	21	7	7	7	6	7	14	15
Total N_2O Emission	1,880	1,908	1,857	1,881	1,881	1,874	1,915	1,723	1,624	1,599	1,813	1,778
3.B Livestock Waste Treatment	48	50	52	54	59	61	67	70	71	72	73	71
3.D Agricultural Soil	1,820	1,850	1,791	1,821	1,815	1,810	1,846	1,651	1,551	1,524	1,736	1,702
3.F Agricultural Waste Burning (Crop Burning)	12	8	15	7	6	2	2	2	2	2	4	5
Total Emission from Agriculture Sector	3,894	3,955	3,860	3,875	3,848	3,880	3,905	3,579	3,374	3,361	3,562	3,437

Source \ Year	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Total CO_2 Emission	93	82	84	62	59	57	57	55	54	53	55	45
Total CH_4 Emission	1,479	1,394	1,320	1,387	1,368	1,341	1,299	1,282	1,274	1,301	1,300	1,304
3.A Livestock Gastrointestinal Fermentation	636	626	614	623	614	609	584	571	578	590	583	579
3.B Livestock Waste Treatment	194	192	193	195	195	185	180	175	176	180	172	166
3.C Rice Culturing	637	567	505	561	551	543	529	530	514	526	540	555
3.F Agricultural Waste Burning (Crop Burning)	13	9	8	8	8	5	6	5	5	5	5	3
Total N_2O Emission	1,793	1,672	1,796	1,672	1,704	1,666	1,590	1,625	1,609	1,546	1,571	1,489
3.B Livestock Waste Treatment	70	71	69	71	72	71	72	71	70	71	71	71
3.D Agricultural Soil	1,718	1,598	1,724	1,599	1,630	1,594	1,517	1,553	1,536	1,474	1,499	1,417
3.F Agricultural Waste Burning (Crop Burning)	4	3	2	2	3	1	2	2	2	2	2	1
Total Emission from Agriculture Sector	3,365	3,148	3,199	3,122	3,132	3,065	2,946	2,962	2,937	2,900	2,926	2,839

50.03% （majority）, methane emission from 3.A. "Livestock gastrointestinal fermentation" accounted for 20.36%, methane emission from 3.C. "Rice culturing" accounted for 19.51%, methane emission from 3.B. "Livestock waste treatment" accounted for 5.84%, nitrous dioxide emission from 3.B. "Livestock waste treatment" accounted for 2.51%, carbon dioxide emission from 3.H "Urea application" accounted for 1.60%, methane emission from 3.F. "Crop burning" accounted for 0.12%, and nitrous dioxide emission from "agricultural waste burning" accounted for 0.04%.

The main source of greenhouse gas absorbed by land use and forestry sector is carbon dioxide and the annual carbon stock increase from forestry resources. The greenhouse gas emission from land use and forestry sector for Taiwan from year 1990 to 2013 （mainly consists of carbon dioxide absorption by forestry resources） is shown in Table ES3.5. The 2013 absorption was 21,069 kilotons of carbon dioxide equivalents, up by 8 kilotons of carbon dioxide equivalents compared to that in 2012 （0.04%）. The carbon dioxide absorption between 1990 and 2013 was up 9.36%, with an average annual growth rate of 0.84%.

The greenhouse gas emission from waste sector in 2013 was 4,447 kilotons of carbon dioxide equivalents, approximately accounting for 1.56% of total greenhouse gas emission in Taiwan （as shown in Table ES3.6）, down by 50.95% compared to that in 1990, with an average annual growth down by 3.14%. Among the waste sector emission in 2013, methane emission from 5.A " Solid Waste disposal " accounted for 37.97%, followed by methane and nitrous oxide from 5.D " Waste Water Treatment and Discharge " accounting for 60.92%, methane and nitrous oxide from 5.B " Solid Waste Biological Disposal " accounting for 0.96%, carbon dioxide and nitrous oxide from 5.C " Waste burn " accounting for 0.11%.

ES.4 Other Information

According to the Durban Platform, all countries listed on Annex I shall submit the National Inventory Report, Biennial Report, and National Communications while countries not listed in Annex I shall submit Biennial Update Report and National Communications. These national reports all relate to the content of National Greenhouse Gas Inventory. Taiwan is currently taking the initiative in establishing a national system that is feasible to conform to Taiwan customs, division of labor in sectors and the hierarchical management of database. In addition to formulating regulations governing national greenhouse gas inventory review, Taiwan also established a review

Table ES3.5 Carbon Dioxide Absorption of Forestry Sector for Taiwan from Year 1990 to 2013

(Unit: Kilotons of Carbon Dioxide Equivalents)

Year	Existing Forests		Other Lands Turned to Forests	Overall Carbon Dioxide Absorption Annually
	Year-on-Year Increase	Year-on-Year Loss	Year-on-Year increase	
1990	-19,782	607	-91	-19,265
1991	-19,782	2,503	-91	-17,370
1992	-19,794	333	-136	-19,597
1993	-19,807	216	-184	-19,775
1994	-19,819	190	-233	-19,862
1995	-19,831	202	-288	-19,917
1996	-19,844	559	-318	-19,603
1997	-19,856	266	-396	-19,986
1998	-19,869	326	-445	-19,988
1999	-19,881	401	-559	-20,040
2000	-19,893	389	-663	-20,168
2001	-19,906	1,112	-681	-19,475
2002	-19,918	167	-757	-20,508
2003	-19,931	227	-897	-20,600
2004	-19,943	243	-993	-20,693
2005	-19,956	369	-1,029	-20,616
2006	-19,968	251	-1,043	-20,760
2007	-19,980	308	-1,077	-20,749
2008	-19,993	199	-1,138	-20,932
2009	-20,005	2,753	-1,162	-18,414
2010	-19,911	218	-1,236	-20,928
2011	-19,929	140	-1,198	-20,987
2012	-19,944	145	-1,279	-21,077
2013	-19,981	135	-1,223	-21,069

Table ES3.6 Greenhouse Gas Emission from Waste Sector for Taiwan from Year 1990 o 2013

(Unit: Kilotons of Carbon Dioxide Equivalents)

Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Total CO_2 Emission	20	8	65	63	110	398	387	105	117	65	259	540
5.C Waste Burn	20	8	65	63	110	398	387	105	117	65	259	540
Total CH_4 Emission	8,750	8,980	9,044	9,423	10,196	10,899	11,329	11,454	11,556	11,640	11,429	10,624
5.A Solid Waste Disposal	5,832	5,917	5,928	6,323	7,061	7,719	8,080	8,212	8,372	8,596	8,512	7,732
5.B Solid Waste Biological Disposal	11	1	1	0	0	1	0	1	0	2	0	0
5.D Waste Water Treatment and Discharge	2,907	3,062	3,115	3,100	3,135	3,179	3,249	3,241	3,184	3,042	2,916	2,891
Total N_2O Emission	296	285	298	311	313	334	337	337	321	329	331	340
5.B Solid Waste Biological Disposal	10	0	1	0	0	1	0	1	0	2	0	0
5.C Waste Burn	1	0	4	3	6	18	19	4	6	3	8	30
5.D Waste Water Treatment and Discharge	285	284	294	307	307	316	318	332	315	324	322	310
Total Emission from Waste Sector	9,066	9,273	9,407	9,798	10,619	11,631	12,053	11,896	11,993	12,035	12,018	11,504
Year	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Total CO_2 Emission	612	417	512	348	470	562	443	154	208	115	61	4
5.C Waste Burn	612	417	512	348	470	562	443	154	208	115	61	4
Total CH_4 Emission	10,079	9,607	8,926	8,350	7,699	7,192	6,535	5,906	5,304	4,863	4,508	4,103
5.A Solid Waste Disposal	7,214	6,675	6,101	5,525	4,930	4,379	3,814	3,246	2,749	2,352	1,997	1,688
5.B Solid Waste Biological Disposal	0	2	7	10	11	14	16	18	21	26	24	23
5.D Waste Water Treatment and Discharge	2,864	2,930	2,818	2,815	2,757	2,798	2,705	2,642	2,535	2,485	2,486	2,392
Total N_2O Emission	348	353	343	350	351	360	328	327	337	344	339	339
5.B Solid Waste Biological Disposal	0	2	6	9	10	13	15	16	19	23	22	20
5.C Waste Burn	26	24	23	27	30	30	21	9	11	7	4	0
5.D Waste Water Treatment and Discharge	321	327	314	314	310	318	293	302	307	313	314	318
Total Emission from Waste Sector	11,039	10,377	9,781	9,047	8,519	8,114	7,306	6,387	5,849	5,322	4,908	4,447

committee, a review on greenhouse gas inventory, and a sound management system to comply with procedures of Measurement Reporting, Verification （MRV）. Moreover, in order to cooperate with UNFCCC, Taiwan shall apply 2006 IPCC Guidelines for National Greenhouse Gas Inventories （hereinafter referred to as 2006 IPPC Guidelines） starting in 2015. We have started preparing a national greenhouse gas inventory with 2006 IPCC Guidelines based statistical foundation and framework in addition to designing and establishing a registration platform for electronic national greenhouse gas inventory starting in 2013. At the same time, the relevant departments will test run this registration platform and submit the national greenhouse gas inventory statistics online. Taiwan is scheduled to comprehensively apply （or adopt） the 2006 IPCC Guidelines in step with UNFCCC starting in 2015.

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