ANNEX
Liechtenstein's Biennial Report 5

December 2022

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1. Introduction

The Government of Liechtenstein is pleased to present its Fifth Biennial Report (BR5). Liechtenstein's Fifth Biennial Report follows the UNFCCC biennial reporting guidelines for developed country Parties.

The Biennial Report complements the existing national reports "National Inventory Report (NIR)" and "National Communication (NC)". Liechtenstein's BR5 has been prepared as Annex to Liechtenstein's Eighth National Communication. Due to the fact that both reports have to be submitted by 31st of December 2022 and considering the overlap of some information to be reported according to the respective guidelines, Liechtenstein decided to refer to the respective sections of its Eighth National Communication in those cases, where such overlap would occur within the Biennial Report.

Liechtenstein's Fifth Biennial Report has been prepared by:

Office of Environment Liechtenstein

Environmental Protection Division

P.O. Box 684, 9490 Vaduz, Liechtenstein.

2. Information on GHG emissions and trends

Summary of Liechtenstein's latest greenhouse gas inventory

Liechtenstein's greenhouse gas emissions in the year 2020 amount to 179.7 kt CO_2 equivalent (CO2eq) excluding LULUCF sources or sinks (including LULUCF: 184.5 kt CO_2eq). This is equivalent to 4.60 t CO_2eq per capita. Total emissions in 2020 (excl. LULUCF) have declined by 21.4% compared to 1990. Compared to 2019, they decreased by 4.3%. When including LULUCF categories, total emissions decreased by 7.8% between 2019–2020 and by 21.8% between 1990–2020. [1]

Among the different greenhouse gases, CO_2 accounts for the largest share of total emissions. The most important emission sources are fuel combustion activities in the Energy sector. Emissions of CH_4 and N_2O mainly originate from the sector Agriculture and F-gas emissions stem from the sector 2 Industrial processes and product use (IPPU) by definition.

National Inventory Arrangements

The Government of the Principality of Liechtenstein bears the overall responsibility for Liechtenstein's National Inventory System (NIS). By Liechtenstein's Emission Trading Act (Emissionshandelsgesetz, Government 2012), the Office of Environment (OE) is in charge of establishing emission inventories and is therefore also responsible for all aspects concerning the establishing of the National Inventory System (NIS) under the Kyoto Protocol. The responsibility of the OE for establishing the NIS is also described in the report of the Government to the parliament for ratifying the Kyoto Protocol.

For further information please refer to chapter 3 of Liechtenstein's Eighth National Communication.

Notation key used:

- NO means no emissions occurring.
- NE means no estimated emissions.
- NA means not applicable.
- IE means implemented elsewhere.

[1] After the review of Liechtenstein's greenhouse gas inventory of the submission 2022, Liechtenstein resubmitted its CRF Tables in November 2022. In the resubmission, greenhouse gas emissions for the year 2020 were updated (correction of emissions from 1B2 and minor corrections in 1A). The emission data described here is based on the CRF Tables Liechtenstein submitted in April 2022. Therefore, the greenhouse gas emission data in the year 2020 differ from the emissions reported in the CTF Tables 1 and Tables 6, which are based on the CRF Tables submitted in November 2022.

Table 1 LIE_BR5_v0.1
Emission trends: summary
(Sheet 1 of 3)

GREENHOUSE GAS EMISSIONS	Base year[a]	1990	1991	1992	1993	1994	1995	1996	1997	1998
	kt CO_2 eq									
CO_2 emissions without net CO_2 from LULUCF	198.97	198.97	206.33	206.95	215.03	201.11	204.20	205.96	218.38	229.24
CO_2 emissions with net CO_2 from LULUCF	206.24	206.24	197.97	209.42	214.26	219.46	209.24	202.75	226.50	229.69
CH_4 emissions without CH_4 from LULUCF	19.24	19.24	19.17	18.71	17.87	17.93	17.92	18.22	17.93	17.82
CH_4 emissions with CH_4 from LULUCF	19.24	19.24	19.17	18.71	17.87	17.93	17.92	18.22	17.93	17.82
N_2O emissions without N_2O from LULUCF	10.27	10.27	10.54	10.50	10.28	10.25	10.18	10.10	10.16	9.82
N_2O emissions with N_2O from LULUCF	10.57	10.57	10.83	10.79	10.58	10.54	10.47	10.39	10.47	10.14
HFCs	0.00	0.00	0.01	0.08	0.18	0.43	1.24	1.57	1.95	2.51
PFCs	NO	NO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Unspecified mix of HFCs and PFCs	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
SF_6	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
NF3	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Total (without LULUCF)	228.47	228.47	236.04	236.24	243.37	229.72	233.54	235.85	248.42	259.38
Total (with LULUCF)	236.04	236.04	227.98	239.01	242.89	248.37	238.87	232.94	256.85	260.15
Total (without LULUCF, with indirect)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total (with LULUCF, with indirect)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	Base year[a]	1990	1991	1992	1993	1994	1995	1996	1997	1998
	kt CO_2 eq									
1. Energy	201.25	201.25	208.88	209.68	217.85	203.86	207.06	208.90	221.46	232.34
2. Industrial processes and product use	0.66	0.66	0.64	0.69	0.76	0.98	1.77	2.08	2.45	2.98
3. Agriculture	24.90	24.90	24.91	24.23	23.14	23.25	23.10	23.27	22.92	22.46
4. Land Use, Land-Use Change and Forestry[b]	7.57	7.57	-8.06	2.77	-0.48	18.65	5.33	-2.91	8.43	0.77
5. Waste	1.66	1.66	1.61	1.64	1.61	1.62	1.62	1.60	1.59	1.61
6. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Total (including LULUCF)	236.04	236.04	227.98	239.01	242.89	248.37	238.87	232.94	256.85	260.15

Notes:

All footnotes for this table are given on sheet 3 of table 1.

Table 1 LIE_BR5_v0.1
Emission trends: summary
(Sheet 2 of 3)

GREENHOUSE GAS EMISSIONS	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
CO_2 emissions without net CO_2 from LULUCF	226.57	216.86	214.67	220.02	229.35	229.39	228.99	231.12	200.79	219.54	205.37
CO_2 emissions with net CO_2 from LULUCF	225.91	241.66	216.55	222.81	236.14	238.34	237.99	244.91	223.64	244.49	227.39
CH_4 emissions without CH_4 from LULUCF	17.13	16.69	17.56	17.74	17.91	18.00	18.49	19.27	19.51	19.70	19.59
CH_4 emissions with CH_4 from LULUCF	17.13	16.69	17.56	17.74	17.91	18.00	18.49	19.27	19.51	19.70	19.59
N_2O emissions without N_2O from LULUCF	9.58	9.48	9.49	9.58	9.57	9.00	9.12	9.32	9.38	9.57	9.50
N_2O emissions with N_2O from LULUCF	9.91	9.83	9.84	9.95	9.95	9.38	9.51	9.71	9.78	9.98	9.91
HFCs	3.10	3.87	4.67	5.28	5.89	6.53	6.73	7.42	8.19	8.61	8.45
PFCs	0.01	0.01	0.01	0.02	0.03	0.04	0.05	0.07	0.07	0.07	0.06
Unspecified mix of HFCs and PFCs	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
SF_6	0.00	0.09	0.17	0.24	0.25	0.26	0.26	0.06	0.11	0.35	0.14
NF3	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Total (without LULUCF)	256.38	247.01	246.57	252.88	263.01	263.23	263.64	267.24	238.05	257.83	243.10
Total (with LULUCF)	256.06	272.15	248.80	256.04	270.17	272.56	273.03	281.43	261.30	283.19	265.53
Total (without LULUCF, with indirect)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total (with LULUCF, with indirect)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
1. Energy	229.68	220.06	217.74	222.99	232.26	231.83	231.45	233.62	203.24	222.13	207.99
2. Industrial processes and product use	3.57	4.41	5.25	5.93	6.61	7.28	7.49	7.95	8.79	9.41	8.98
3. Agriculture	21.52	20.91	21.95	22.33	22.48	22.46	23.07	24.09	24.45	24.65	24.54
4. Land Use, Land-Use Change and Forestry[b]	-0.33	25.14	2.23	3.16	7.16	9.33	9.39	14.18	23.24	25.36	22.43
5. Waste	1.61	1.62	1.63	1.64	1.65	1.66	1.63	1.59	1.58	1.63	1.59
6. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Total (including LULUCF)	256.06	272.15	248.80	256.04	270.17	272.56	273.03	281.43	261.30	283.19	265.53

Notes:

All footnotes for this table are given on sheet 3 of table 1.

Table 1 LIE_BR5_v0.1
Emission trends: summary
(Sheet 3 of 3)

GREENHOUSE GAS EMISSIONS	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Change from base to latest reported year
												(%)
CO_2 emissions without net CO_2 from LULUCF	190.83	176.78	185.33	192.54	161.26	159.77	149.84	155.77	142.95	149.03	141.94	-28.66
CO_2 emissions with net CO_2 from LULUCF	211.42	201.10	209.91	209.68	178.32	171.55	159.84	167.07	164.93	161.02	146.39	-29.02
CH_4 emissions without CH_4 from LULUCF	19.01	19.36	19.80	18.99	19.17	19.01	19.13	18.64	18.90	19.57	19.71	2.48
CH_4 emissions with CH_4 from LULUCF	19.01	19.36	19.80	18.99	19.17	19.01	19.13	18.64	18.90	19.57	19.71	2.48
N_2O emissions without N_2O from LULUCF	9.29	9.66	9.53	9.22	9.13	9.17	9.01	8.97	9.15	9.30	9.19	-10.53
N_2O emissions with N_2O from LULUCF	9.70	10.08	9.95	9.65	9.55	9.60	9.45	9.39	9.57	9.70	9.58	-9.38
HFCs	8.95	9.44	9.81	9.75	10.03	10.13	9.76	10.03	10.20	9.73	9.11	8,624,277.58
PFCs	0.05	0.06	0.04	0.04	0.03	0.01	0.01	0.00	0.00	0.00	0.00	100.00
Unspecified mix of HFCs and PFCs	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
SF_6	0.02	0.01	0.00	0.17	0.12	0.04	0.01	0.05	0.07	0.05	0.05	100.00
NF3	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
Total (without LULUCF)	228.17	215.32	224.51	230.73	199.73	198.15	187.76	193.46	181.27	187.67	180.01	-21.21
Total (with LULUCF)	249.17	240.05	249.52	248.29	217.21	210.36	198.19	205.17	203.66	200.07	184.85	-21.69
Total (without LULUCF, with indirect)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.00
Total (with LULUCF, with indirect)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.00

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Change from base to latest reported year
												(%)
1. Energy	193.43	179.32	187.93	195.15	163.63	162.18	152.22	158.21	145.42	151.52	144.31	-28.30
2. Industrial processes and product use	9.39	9.86	10.18	10.28	10.48	10.48	10.06	10.35	10.53	10.05	9.43	1,321.01
3. Agriculture	23.73	24.50	24.77	23.65	24.03	23.87	23.88	23.29	23.74	24.50	24.67	-0.93
4. Land Use, Land-Use Change and Forestry[b]	21.01	24.73	25.01	17.56	17.48	12.21	10.43	11.72	22.39	12.40	4.84	-36.07
5. Waste	1.62	1.64	1.62	1.65	1.59	1.62	1.60	1.60	1.58	1.60	1.60	-3.18
6. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
Total (including LULUCF)	249.17	240.05	249.52	248.29	217.21	210.36	198.19	205.17	203.66	200.07	184.85	-21.69

Notes:
Further detailed information could be found in the common reporting format tables of the Party's greenhouse gas inventory,
1 kt CO2 eq equals 1 Gg CO2 eq.

Abbreviation: LULUCF = land use, land-use change and forestry.

[a] The column "Base year" should be filled in only by those Parties with economies in transition that use a base year different

[b] Includes net CO_2, CH_4 and N_2O from LULUCF.

Custom Footnotes

Table 1(a) LIE_BR5_v0.1

Emission trends (CO_2)

(Sheet 1 of 3)

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	*Base year* [a]	1990	1991	1992	1993	1994	1995	1996	1997	1998
	kt									
1. Energy	198.70	198.70	206.07	206.70	214.79	200.89	203.98	205.74	218.14	229.03
A. Fuel combustion (sectoral approach)	198.70	198.70	206.07	206.70	214.79	200.89	203.98	205.74	218.14	229.03
1. Energy industries	0.12	0.12	0.79	1.82	1.88	1.76	2.00	2.50	2.44	2.83
2. Manufacturing industries and construction	36.19	36.19	35.83	36.21	37.47	35.52	35.60	35.66	37.50	40.24
3. Transport	75.36	75.36	88.52	87.75	85.64	78.36	80.30	81.57	85.15	84.89
4. Other sectors	87.02	87.02	80.93	80.92	89.80	85.25	86.09	86.00	93.05	101.08
5. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
B. Fugitive emissions from fuels	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1. Solid fuels	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
2. Oil and natural gas and other emissions from energy production	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C. CO2 transport and storage	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
2. Industrial processes	0.20	0.20	0.19	0.18	0.17	0.16	0.16	0.17	0.18	0.16
A. Mineral industry	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
B. Chemical industry	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
C. Metal industry	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
D. Non-energy products from fuels and solvent use	0.20	0.20	0.19	0.18	0.17	0.16	0.16	0.17	0.18	0.16
E. Electronic industry										
F. Product uses as ODS substitutes										
G. Other product manufacture and use	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
H. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
3. Agriculture	0.06	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.05	0.04
A. Enteric fermentation										
B. Manure management										
C. Rice cultivation										
D. Agricultural soils										
E. Prescribed burning of savannas										
F. Field burning of agricultural residues										
G. Liming	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
H. Urea application	0.06	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.05	0.04
I. Other carbon-containing fertilizers	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
J. Other	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4. Land Use, Land-Use Change and Forestry	7.27	7.27	-8.36	2.47	-0.77	18.35	5.04	-3.21	8.12	0.45
A. Forest land	-0.14	-0.14	-15.96	-5.32	-8.75	10.19	-3.30	-11.72	-0.94	-9.15
B. Cropland	4.49	4.49	4.48	4.47	4.46	4.45	4.44	4.44	4.43	4.43
C. Grassland	1.97	1.97	1.96	1.96	1.95	1.94	1.93	1.92	2.15	2.37
D. Wetlands	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.18	0.20
E. Settlements	3.06	3.06	3.06	3.06	3.06	3.06	3.06	3.06	3.09	3.13
F. Other land	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.50	0.58
G. Harvested wood products	-2.69	-2.69	-2.48	-2.27	-2.07	-1.87	-1.67	-1.48	-1.29	-1.11
H. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
5. Waste	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
A. Solid waste disposal	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
B. Biological treatment of solid waste										
C. Incineration and open burning of waste	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
D. Waste water treatment and discharge										
E. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
6. Other (as specified in the summary table in CRF)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Memo items:										
International bunkers	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.44	0.45	0.46
Aviation	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.44	0.45	0.46
Navigation	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Multilateral operations	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
CO2 emissions from biomass	6.37	6.37	4.97	6.53	6.09	7.38	5.76	5.58	6.45	7.14
CO2 captured	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA
Long-term storage of C in waste disposal sites	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indirect N2O										
Indirect CO2 (3)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Total CO2 equivalent emissions without land use, land-use change and forestry	198.97	198.97	206.33	206.95	215.03	201.11	204.20	205.96	218.38	229.24
Total CO2 equivalent emissions with land use, land-use change and forestry	206.24	206.24	197.97	209.42	214.26	219.46	209.24	202.75	226.50	229.69
Total CO2 equivalent emissions, including indirect CO2, without land use, land-use change and forestry	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total CO2 equivalent emissions, including indirect CO2, with land use, land-use change and forestry	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

All footnotes for this table are given on sheet 3 of table 1(a).

Table 1(a) LIE_BR5_v0.1

Emission trends (CO_2)

(Sheet 2 of 3)

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
1. Energy	226.35	216.63	214.46	219.81	229.10	229.13	228.73	230.88	200.54	219.30	205.18
A. Fuel combustion (sectoral approach)	226.35	216.63	214.46	219.81	229.10	229.13	228.73	230.88	200.54	219.30	205.18
1. Energy industries	2.83	2.67	2.83	2.42	2.73	2.85	3.03	2.75	2.48	2.81	2.87
2. Manufacturing industries and construction	39.70	36.31	36.30	37.76	41.06	39.70	39.03	40.40	33.79	36.24	27.45
3. Transport	89.03	89.84	86.51	82.62	82.51	81.45	81.08	78.56	82.68	87.09	81.21
4. Other sectors	94.79	87.82	88.82	97.00	102.80	105.12	105.58	109.17	81.59	93.16	93.65
5. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
B. Fugitive emissions from fuels	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1. Solid fuels	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
2. Oil and natural gas and other emissions from energy production	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C. CO2 transport and storage	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
2. Industrial processes	0.17	0.17	0.15	0.15	0.20	0.20	0.20	0.19	0.20	0.18	0.14
A. Mineral industry	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
B. Chemical industry	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
C. Metal industry	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
D. Non-energy products from fuels and solvent use	0.17	0.17	0.15	0.15	0.20	0.20	0.20	0.19	0.20	0.18	0.14
E. Electronic industry											
F. Product uses as ODS substitutes											
G. Other product manufacture and use	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
H. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
3. Agriculture	0.04	0.05	0.04	0.05	0.05	0.05	0.05	0.05	0.04	0.05	0.04
A. Enteric fermentation											
B. Manure management											
C. Rice cultivation											
D. Agricultural soils											
E. Prescribed burning of savannas											
F. Field burning of agricultural residues											
G. Liming	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
H. Urea application	0.04	0.05	0.04	0.05	0.05	0.05	0.05	0.05	0.04	0.05	0.04
I. Other carbon-containing fertilizers	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
J. Other	NO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4. Land Use, Land-Use Change and Forestry	-0.66	24.80	1.88	2.79	6.78	8.95	9.00	13.78	22.84	24.95	22.02
A. Forest land	-10.80	14.12	-9.27	-8.82	-5.08	-3.16	-3.36	1.17	9.98	11.86	8.78
B. Cropland	4.43	4.43	4.43	4.43	4.41	4.38	4.36	4.34	4.32	4.30	4.30
C. Grassland	2.59	2.81	3.04	3.25	3.38	3.51	3.63	3.76	3.88	4.01	4.04
D. Wetlands	0.22	0.24	0.26	0.28	0.29	0.29	0.30	0.30	0.31	0.31	0.33
E. Settlements	3.17	3.20	3.24	3.28	3.29	3.29	3.30	3.31	3.32	3.32	3.32
F. Other land	0.67	0.75	0.83	0.91	0.94	0.98	1.02	1.05	1.09	1.12	1.12
G. Harvested wood products	-0.93	-0.75	-0.65	-0.54	-0.44	-0.34	-0.25	-0.15	-0.06	0.04	0.13
H. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
5. Waste	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
A. Solid waste disposal	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
B. Biological treatment of solid waste											
C. Incineration and open burning of waste	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
D. Waste water treatment and discharge											
E. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
6. Other (as specified in the summary table in CRF)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Memo items:											
International bunkers	0.48	0.49	0.50	0.45	0.50	0.34	0.48	0.83	0.82	0.80	0.97
Aviation	0.48	0.49	0.50	0.45	0.50	0.34	0.48	0.83	0.82	0.80	0.97
Navigation	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Multilateral operations	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
CO2 emissions from biomass	7.79	12.05	8.14	8.33	10.44	11.33	12.25	13.89	18.00	18.19	21.52
CO2 captured	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA		NO, NA	NO, NA	NO, NA	NO, NA
Long-term storage of C in waste disposal sites	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indirect N2O											
Indirect CO2 (3)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Total CO2 equivalent emissions without land use, land-use change and forestry	226.57	216.86	214.67	220.02	229.35	229.39	228.99	231.12	200.79	219.54	205.37
Total CO2 equivalent emissions with land use, land-use change and forestry	225.91	241.66	216.55	222.81	236.14	238.34	237.99	244.91	223.64	244.49	227.39
Total CO2 equivalent emissions, including indirect CO2, without land use, land-use change and forestry	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total CO2 equivalent emissions, including indirect CO2, with land use, land-use change and forestry	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

All footnotes for this table are given on sheet 3 of table 1(a).

Table 1(a) LIE_BR5_v0.1

Emission trends (CO_2)

(Sheet 3 of 3)

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Change from base to latest reported year
												%
1. Energy	190.63	176.58	185.13	192.35	161.06	159.58	149.65	155.58	142.77	148.85	141.77	-28.65
A. Fuel combustion (sectoral approach)	190.63	176.58	185.13	192.35	161.06	159.58	149.65	155.58	142.77	148.85	141.77	-28.65
1. Energy industries	3.15	2.95	2.71	2.92	2.48	2.02	2.14	2.09	2.15	3.38	2.41	1,886.16
2. Manufacturing industries and construction	25.98	23.47	25.62	26.29	27.23	27.49	25.86	27.59	24.51	24.03	22.76	-37.11
3. Transport	77.08	76.24	79.27	78.98	73.18	61.31	59.91	60.26	58.23	56.78	52.21	-30.72
4. Other sectors	84.41	73.91	77.54	84.16	58.17	68.76	61.74	65.64	57.88	64.66	64.39	-26.01
5. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
B. Fugitive emissions from fuels	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	225.08
1. Solid fuels	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
2. Oil and natural gas and other emissions from energy production	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	225.08
C. CO2 transport and storage	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
2. Industrial processes	0.15	0.15	0.14	0.14	0.14	0.14	0.14	0.13	0.12	0.12	0.12	-39.99
A. Mineral industry	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
B. Chemical industry	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
C. Metal industry	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
D. Non-energy products from fuels and solvent use	0.15	0.15	0.14	0.14	0.14	0.14	0.14	0.13	0.12	0.12	0.12	-39.99
E. Electronic industry												
F. Product uses as ODS substitutes												
G. Other product manufacture and use	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
H. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
3. Agriculture	0.04	0.05	0.04	0.04	0.04	0.05	0.04	0.04	0.05	0.05	0.04	-31.01
A. Enteric fermentation												
B. Manure management												
C. Rice cultivation												
D. Agricultural soils												
E. Prescribed burning of savannas												
F. Field burning of agricultural residues												
G. Liming	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
H. Urea application	0.04	0.05	0.04	0.04	0.04	0.05	0.04	0.04	0.05	0.05	0.04	-31.01
I. Other carbon-containing fertilizers	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	0.00
J. Other	NA	NA	NA	NA	NA	NA	NA	NA		NA	NA	0.00
4. Land Use, Land-Use Change and Forestry	20.59	24.31	24.59	17.14	17.06	11.78	10.00	11.30	21.98	12.00	4.45	-38.80
A. Forest land	7.22	10.89	11.13	3.63	3.51	-1.80	-3.62	-1.98	9.04	-0.60	-7.81	5,541.49
B. Cropland	4.30	4.30	4.31	4.31	4.31	4.30	4.29	4.27	4.26	4.24	4.22	-5.89
C. Grassland	4.08	4.11	4.14	4.18	4.21	4.25	4.28	4.09	3.90	3.71	3.51	78.03
D. Wetlands	0.34	0.36	0.38	0.39	0.41	0.42	0.44	0.43	0.42	0.42	0.41	165.61
E. Settlements	3.32	3.31	3.31	3.30	3.30	3.30	3.29	3.25	3.21	3.17	3.13	2.42
F. Other land	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.04	0.96	0.88	0.80	89.50
G. Harvested wood products	0.21	0.21	0.21	0.20	0.20	0.19	0.19	0.19	0.18	0.18	0.18	-106.53
H. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
5. Waste	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	-26.23
A. Solid waste disposal	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
B. Biological treatment of solid waste												
C. Incineration and open burning of waste	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	-26.23
D. Waste water treatment and discharge												
E. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
6. Other (as specified in the summary table in CRF)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
Memo items:												
International bunkers	0.84	0.91	1.11	1.05	1.18	1.19	0.92	0.86	1.09	1.12	0.93	118.74
Aviation	0.84	0.91	1.11	1.05	1.18	1.19	0.92	0.86	1.09	1.12	0.93	118.74
Navigation	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
Multilateral operations	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
CO2 emissions from biomass	22.83	24.69	25.19	22.01	22.51	25.34	24.98	24.26	28.81	26.77	21.76	241.48
CO2 captured	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NE, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	0.00
Long-term storage of C in waste disposal sites	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.00
Indirect N2O												
Indirect CO2 (3)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
Total CO2 equivalent emissions without land use, land-use change and forestry	190.83	176.78	185.33	192.54	161.26	159.77	149.84	155.77	142.95	149.03	141.94	-28.66
Total CO2 equivalent emissions with land use, land-use change and forestry	211.42	201.10	209.91	209.68	178.32	171.55	159.84	167.07	164.93	161.02	146.39	-29.02
Total CO2 equivalent emissions, including indirect CO2, without land use, land-use change and forestry	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.00
Total CO2 equivalent emissions, including indirect CO2, with land use, land-use change and forestry	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.00

Abbreviations : CRF = common reporting format, LULUCF = land use, land-use change and forestry.

[a] The column "Base year" should be filled in only by those Parties with economies in transition that use a base year different from 1990 in accordance with the relevant decisions of the Conference of the Parties. For these Parties, this different base year is used to calculate the percentage change in the final column of this table.

[b] Fill in net emissions/removals as reported in CRF table Summary 1.A of the latest reported inventory year. For the purposes of reporting, the signs for removals are always negative (-) and for emissions positive (+).

Custom Footnotes

Table 1(b) LIE_BR5_v0.1

Emission trends (CH_4)

(Sheet 1 of 3)

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	*Base year*[a]	1990	1991	1992	1993	1994	1995	1996	1997	1998
	kt									
1. Energy	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.06	0.06
A. Fuel combustion (sectoral approach)	0.04	0.04	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.03
1. Energy industries	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2. Manufacturing industries and construction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3. Transport	0.03	0.03	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.01
4. Other sectors	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
5. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
B. Fugitive emissions from fuels	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.03
1. Solid fuels	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
2. Oil and natural gas and other emissions from energy production	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.03
C. CO2 transport and storage										
2. Industrial processes	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
A. Mineral industry										
B. Chemical industry	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
C. Metal industry	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
D. Non-energy products from fuels and solvent use	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
E. Electronic industry										
F. Product uses as ODS substitutes										
G. Other product manufacture and use	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
H. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
3. Agriculture	0.67	0.67	0.67	0.65	0.62	0.62	0.62	0.63	0.62	0.61
A. Enteric fermentation	0.56	0.56	0.55	0.54	0.51	0.51	0.52	0.53	0.52	0.51
B. Manure management	0.12	0.12	0.12	0.11	0.11	0.11	0.11	0.11	0.10	0.10
C. Rice cultivation	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA
D. Agricultural soils	NA, NO	NA, NO	NA, NO	NA, NO	NA, NO	NA, NO	NA, NO	NA, NO	NA, NO	NA, NO
E. Prescribed burning of savannas	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
F. Field burning of agricultural residues	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA
G. Liming										
H. Urea application										
I. Other carbon-containing fertilizers										
J. Other	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4. Land use, land-use change and forestry	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
A. Forest land	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
B. Cropland	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
C. Grassland	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
D. Wetlands	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
E. Settlements	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
F. Other land	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
G. Harvested wood products										
H. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
5. Waste	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
A. Solid waste disposal	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01
B. Biological treatment of solid waste	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C. Incineration and open burning of waste	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
D. Waste water treatment and discharge	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.03
E. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
6. Other (as specified in the summary table in CRF)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Total CH4 emissions without CH4 from LULUCF	0.77	0.77	0.77	0.75	0.71	0.72	0.72	0.73	0.72	0.71
Total CH4 emissions with CH4 from LULUCF	0.77	0.77	0.77	0.75	0.71	0.72	0.72	0.73	0.72	0.71
Memo items:										
International bunkers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Aviation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Navigation	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Multilateral operations	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
CO2 emissions from biomass										
CO2 captured										
Long-term storage of C in waste disposal sites										
Indirect N2O										
Indirect CO2 (3)										

Notes:

All footnotes for this table are given on sheet 3 of table 1(b).

Table 1(b) LIE_BR5_v0.1

Emission trends (CH_4)

(Sheet 2 of 3)

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
1. Energy	0.06	0.06	0.06	0.06	0.06	0.07	0.07	0.07	0.07	0.07	0.07
A. Fuel combustion (sectoral approach)	0.03	0.03	0.03	0.03	0.03	0.02	0.02	0.02	0.02	0.02	0.02
1. Energy industries	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2. Manufacturing industries and construction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3. Transport	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
4. Other sectors	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02
5. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
B. Fugitive emissions from fuels	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.05	0.05	0.04
1. Solid fuels	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
2. Oil and natural gas and other emissions from energy production	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.05	0.05	0.04
C. CO2 transport and storage											
2. Industrial processes	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
A. Mineral industry											
B. Chemical industry	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
C. Metal industry	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
D. Non-energy products from fuels and solvent use	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
E. Electronic industry											
F. Product uses as ODS substitutes											
G. Other product manufacture and use	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
H. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
3. Agriculture	0.58	0.57	0.60	0.61	0.61	0.61	0.63	0.66	0.67	0.68	0.68
A. Enteric fermentation	0.49	0.47	0.50	0.51	0.51	0.52	0.53	0.56	0.57	0.57	0.57
B. Manure management	0.10	0.09	0.10	0.10	0.10	0.09	0.10	0.10	0.11	0.11	0.11
C. Rice cultivation	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA
D. Agricultural soils	NA, NO	NA, NO	NA, NO	NA, NO	NA, NO	NA, NO	NA, NO	NA, NO	NA, NO	NA, NO	NA, NO
E. Prescribed burning of savannas	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
F. Field burning of agricultural residues	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA
G. Liming											
H. Urea application											
I. Other carbon-containing fertilizers											
J. Other	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4. Land use, land-use change and forestry	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
A. Forest land	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
B. Cropland	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
C. Grassland	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
D. Wetlands	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
E. Settlements	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
F. Other land	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
G. Harvested wood products											
H. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
5. Waste	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
A. Solid waste disposal	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
B. Biological treatment of solid waste	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C. Incineration and open burning of waste	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
D. Waste water treatment and discharge	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
E. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
6. Other (as specified in the summary table in CRF)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Total CH4 emissions without CH4 from LULUCF	0.69	0.67	0.70	0.71	0.72	0.72	0.74	0.77	0.78	0.79	0.78
Total CH4 emissions with CH4 from LULUCF	0.69	0.67	0.70	0.71	0.72	0.72	0.74	0.77	0.78	0.79	0.78
Memo items:											
International bunkers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Aviation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Navigation	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Multilateral operations	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
CO2 emissions from biomass											
CO2 captured											
Long-term storage of C in waste disposal sites											
Indirect N2O											
Indirect CO2 (3)											

Notes:

All footnotes for this table are given on sheet 3 of table 1(b).

Table 1(b) LIE_BR5_v0.1

Emission trends (CH_4)

(Sheet 3 of 3)

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Change from base to latest reported year
												%
1. Energy	0.07	0.07	0.07	0.07	0.06	0.07	0.06	0.07	0.07	0.07	0.06	24.65
A. Fuel combustion (sectoral approach)	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	-55.24
1. Energy industries	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	650.50
2. Manufacturing industries and construction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-46.77
3. Transport	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-88.57
4. Other sectors	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	12.59
5. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
B. Fugitive emissions from fuels	0.05	0.04	0.05	0.05	0.04	0.05	0.05	0.05	0.05	0.05	0.05	225.08
1. Solid fuels	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
2. Oil and natural gas and other emissions from energy production	0.05	0.04	0.05	0.05	0.04	0.05	0.05	0.05	0.05	0.05	0.05	225.08
C. CO2 transport and storage												
2. Industrial processes	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
A. Mineral industry												
B. Chemical industry	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
C. Metal industry	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
D. Non-energy products from fuels and solvent use	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
E. Electronic industry												
F. Product uses as ODS substitutes												
G. Other product manufacture and use	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
H. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
3. Agriculture	0.65	0.67	0.69	0.65	0.67	0.66	0.66	0.64	0.65	0.68	0.69	1.97
A. Enteric fermentation	0.55	0.56	0.58	0.55	0.56	0.55	0.56	0.54	0.55	0.57	0.58	3.54
B. Manure management	0.10	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	-5.50
C. Rice cultivation	NO, NA	NO, NA	NO, NA	NO, NA	NA, NO	NO, NA	NO, NA	NO, NA	NO	NO	NO	0.00
D. Agricultural soils	NA, NO	NA, NO	NA, NO	NA, NO	NA, NO	NA, NO	NA, NO	NA, NO	NA, NO	NA, NO	NA, NO	0.00
E. Prescribed burning of savannas	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
F. Field burning of agricultural residues	NO, NA	NO, NA	NO, NA	NO, NA	NA, NO	NA, NO	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	0.00
G. Liming												
H. Urea application												
I. Other carbon-containing fertilizers												
J. Other	NA	NA	NA	NA	NA	NA	NA	NA		NA	NA	0.00
4. Land use, land-use change and forestry	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
A. Forest land	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
B. Cropland	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
C. Grassland	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
D. Wetlands	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
E. Settlements	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
F. Other land	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
G. Harvested wood products												
H. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
5. Waste	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	-15.40
A. Solid waste disposal	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	-80.97
B. Biological treatment of solid waste	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	73.42
C. Incineration and open burning of waste	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-22.94
D. Waste water treatment and discharge	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	33.87
E. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
6. Other (as specified in the summary table in CRF)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
Total CH4 emissions without CH4 from LULUCF	0.76	0.77	0.79	0.76	0.77	0.76	0.77	0.75	0.76	0.78	0.79	2.48
Total CH4 emissions with CH4 from LULUCF	0.76	0.77	0.79	0.76	0.77	0.76	0.77	0.75	0.76	0.78	0.79	2.48
Memo items:												
International bunkers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	119.95
Aviation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	119.95
Navigation	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
Multilateral operations	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
CO2 emissions from biomass												
CO2 captured												
Long-term storage of C in waste disposal sites												
Indirect N2O												
Indirect CO2 (3)												

Abbreviations: CRF = common reporting format, LULUCF = land use, land-use change and forestry.

[a] The column "Base year" should be filled in only by those Parties with economies in transition that use a base year different from 1990 in accordance with the relevant decisions of the Conference of the Parties. For these Parties, this different base year is used to calculate the percentage change in the final column of this table.

Custom Footnotes

Table 1(c) LIE_BR5_v0.1

Emission trends (N_2O)

(Sheet 1 of 3)

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	*Base year*[a]	1990	1991	1992	1993	1994	1995	1996	1997	1998
	kt									
1. Energy	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01
A. Fuel combustion (sectoral approach)	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01
1. Energy industries	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2. Manufacturing industries and construction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3. Transport	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
4. Other sectors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
B. Fugitive emissions from fuels	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA
1. Solid fuels	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
2. Oil and natural gas and other emissions from energy production	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA
C. CO2 transport and storage										
2. Industrial processes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A. Mineral industry										
B. Chemical industry	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
C. Metal industry	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
D. Non-energy products from fuels and solvent use	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
E. Electronic industry										
F. Product uses as ODS substitutes										
G. Other product manufacture and use	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
H. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
3. Agriculture	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.02	0.02	0.02
A. Enteric fermentation										
B. Manure management	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C. Rice cultivation										
D. Agricultural soils	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
E. Prescribed burning of savannas	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
F. Field burning of agricultural residues	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA
G. Liming										
H. Urea application										
I. Other carbon containing fertlizers										
J. Other	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4. Land use, land-use change and forestry	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A. Forest land	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
B. Cropland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C. Grassland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
D. Wetlands	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E. Settlements	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
F. Other land	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
G. Harvested wood products										
H. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
5. Waste	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A. Solid waste disposal										
B. Biological treatment of solid waste	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C. Incineration and open burning of waste	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
D. Waste water treatment and discharge	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
6. Other (as specified in the summary table in CRF)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Total direct N2O emissions without N2O from LULUCF	0.03	0.03	0.04	0.04	0.03	0.03	0.03	0.03	0.03	0.03
Total direct N2O emissions with N2O from LULUCF	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.03	0.04	0.03
Memo items:										
International bunkers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Aviation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Navigation	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Multilateral operations	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
CO2 emissions from biomass										
CO2 captured										
Long-term storage of C in waste disposal sites										
Indirect N2O	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Indirect CO2 (3)										

Notes:

All footnotes for this table are given on sheet 3 of table 1(c).

Custom Footnotes

Table 1(c) LIE_BR5_v0.1

Emission trends (N_2O)

(Sheet 2 of 3)

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
1. Energy	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00
A. Fuel combustion (sectoral approach)	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00
1. Energy industries	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2. Manufacturing industries and construction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3. Transport	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4. Other sectors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
B. Fugitive emissions from fuels	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA
1. Solid fuels	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
2. Oil and natural gas and other emissions from energy production	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA
C. CO2 transport and storage											
2. Industrial processes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A. Mineral industry											
B. Chemical industry	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
C. Metal industry	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
D. Non-energy products from fuels and solvent use	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
E. Electronic industry											
F. Product uses as ODS substitutes											
G. Other product manufacture and use	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
H. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
3. Agriculture	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.03
A. Enteric fermentation											
B. Manure management	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01
C. Rice cultivation											
D. Agricultural soils	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
E. Prescribed burning of savannas	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
F. Field burning of agricultural residues	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA
G. Liming											
H. Urea application											
I. Other carbon containing fertlizers											
J. Other	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4. Land use, land-use change and forestry	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A. Forest land	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
B. Cropland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C. Grassland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
D. Wetlands	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E. Settlements	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
F. Other land	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
G. Harvested wood products											
H. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
5. Waste	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A. Solid waste disposal											
B. Biological treatment of solid waste	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C. Incineration and open burning of waste	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
D. Waste water treatment and discharge	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
6. Other (as specified in the summary table in CRF)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Total direct N2O emissions without N2O from LULUCF	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Total direct N2O emissions with N2O from LULUCF	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Memo items:											
International bunkers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Aviation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Navigation	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Multilateral operations	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
CO2 emissions from biomass											
CO2 captured											
Long-term storage of C in waste disposal sites											
Indirect N2O	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Indirect CO2 (3)											

Notes:

All footnotes for this table are given on sheet 3 of table 1(c).

Custom Footnotes

Table 1(c) LIE_BR5_v0.1

Emission trends (N_2O)

(Sheet 3 of 3)

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Change from base to latest reported year
												%
1. Energy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-26.49
A. Fuel combustion (sectoral approach)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-26.49
1. Energy industries	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-94.06
2. Manufacturing industries and construction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-4.20
3. Transport	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-45.57
4. Other sectors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	44.60
5. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
B. Fugitive emissions from fuels	NO, NA	NO, NA	NO, NA	NO, NA	NA, NO	NA, NO	NO, NA	NO, NA	NO	NO, NA	NO, NA	0.00
1. Solid fuels	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
2. Oil and natural gas and other emissions from energy production	NO, NA	NO, NA	NO, NA	NO, NA	NA, NO	NA, NO	NO, NA	NO, NA	NO	NO, NA	NO, NA	0.00
C. CO2 transport and storage												
2. Industrial processes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-68.96
A. Mineral industry												
B. Chemical industry	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
C. Metal industry	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
D. Non-energy products from fuels and solvent use	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
E. Electronic industry												
F. Product uses as ODS substitutes												
G. Other product manufacture and use	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-68.96
H. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
3. Agriculture	0.02	0.03	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.02	-6.84
A. Enteric fermentation												
B. Manure management	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01	13.52
C. Rice cultivation												
D. Agricultural soils	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	-11.05
E. Prescribed burning of savannas	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
F. Field burning of agricultural residues	NO, NA	NO, NA	NO, NA	NO, NA	NA, NO	NA, NO	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	0.00
G. Liming												
H. Urea application												
I. Other carbon containing fertlizers												
J. Other	NA	NA	NA	NA	NA	NA	NA	NA		NA	NA	0.00
4. Land use, land-use change and forestry	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	30.33
A. Forest land	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
B. Cropland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	109.84
C. Grassland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	341.03
D. Wetlands	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	262.79
E. Settlements	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1.07
F. Other land	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	87.51
G. Harvested wood products												
H. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
5. Waste	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	22.64
A. Solid waste disposal												
B. Biological treatment of solid waste	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	73.42
C. Incineration and open burning of waste	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-22.94
D. Waste water treatment and discharge	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	21.07
E. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
6. Other (as specified in the summary table in CRF)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
Total direct N2O emissions without N2O from LULUCF	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	-10.53
Total direct N2O emissions with N2O from LULUCF	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	-9.38
Memo items:												
International bunkers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	119.95
Aviation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	119.95
Navigation	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
Multilateral operations	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
CO2 emissions from biomass												
CO2 captured												
Long-term storage of C in waste disposal sites												
Indirect N2O	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
Indirect CO2 (3)												

Abbreviations : CRF = common reporting format, LULUCF = land use, land-use change and forestry.

[a] The column "Base year" should be filled in only by those Parties with economies in transition that use a base year different from 1990 in accordance with the relevant decisions of the Conference of the Parties. For these Parties, this different base year is used to calculate the percentage change in the final column of this table.

Custom Footnotes

Table 1(d) LIE_BR5_v0.1

Emission trends (HFCs, PFCs and SF_6)

(Sheet 1 of 3)

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	*Base year*[a] *kt*	1990	1991	1992	1993	1994	1995	1996	1997	1998
Emissions of HFCs and PFCs - (kt CO2 equivalent)	0.00	0.00	0.01	0.08	0.18	0.43	1.24	1.57	1.95	2.51
Emissions of HFCs - (kt CO2 equivalent)	0.00	0.00	0.01	0.08	0.18	0.43	1.24	1.57	1.95	2.51
HFC-23	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
HFC-32	NO	NO	NO	NO	0.00	0.00	0.00	0.00	0.00	0.00
HFC-41	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
HFC-43-10mee	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
HFC-125	NO	NO	NO	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HFC-134	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
HFC-134a	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HFC-143	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
HFC-143a	NO	NO	NO	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HFC-152	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
HFC-152a	NO	NO	NO	NO	NO	NO	0.00	0.00	0.00	0.00
HFC-161	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
HFC-227ea	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
HFC-236cb	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
HFC-236ea	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
HFC-236fa	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
HFC-245ca	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
HFC-245fa	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
HFC-365mfc	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Unspecified mix of HFCs(4) - (kt CO_2 equivalent)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Emissions of PFCs - (kt CO2 equivalent)	NO	NO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CF_4	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
C_2F_6	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
C_3F_8	NO	NO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C_4F_{10}	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
c-C_4F_8	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
C_5F_{12}	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
C_6F_{14}	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
C10F18	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
c-C3F6	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Unspecified mix of PFCs(4) - (kt CO_2 equivalent)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Unspecified mix of HFCs and PFCs - (kt CO2 equivalent)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Emissions of SF6 - (kt CO2 equivalent)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
SF_6	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Emissions of NF3 - (kt CO2 equivalent)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
NF3	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO

Notes:

All footnotes for this table are given on sheet 3 of table 1(d).

Table 1(d) LIE_BR5_v0.1

Emission trends (HFCs, PFCs and SF_6)

(Sheet 2 of 3)

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Emissions of HFCs and PFCs - (kt CO2 equivalent)	3.11	3.88	4.68	5.30	5.92	6.57	6.79	7.48	8.26	8.68	8.50
Emissions of HFCs - (kt CO2 equivalent)	3.10	3.87	4.67	5.28	5.89	6.53	6.73	7.42	8.19	8.61	8.45
HFC-23	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
HFC-32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HFC-41	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
HFC-43-10mee	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
HFC-125	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HFC-134	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
HFC-134a	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HFC-143	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
HFC-143a	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HFC-152	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
HFC-152a	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HFC-161	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
HFC-227ea	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HFC-236cb	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
HFC-236ea	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
HFC-236fa	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
HFC-245ca	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
HFC-245fa	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
HFC-365mfc	NO	NO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Unspecified mix of HFCs(4) - (kt CO_2 equivalent)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Emissions of PFCs - (kt CO2 equivalent)	0.01	0.01	0.01	0.02	0.03	0.04	0.05	0.07	0.07	0.07	0.06
CF_4	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
C_2F_6	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
C_3F_8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C_4F_{10}	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
c-C_4F_8	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
C_5F_{12}	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
C_6F_{14}	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
C10F18	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
c-C3F6	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Unspecified mix of PFCs(4) - (kt CO_2 equivalent)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Unspecified mix of HFCs and PFCs - (kt CO2 equivalent)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Emissions of SF6 - (kt CO2 equivalent)	0.00	0.09	0.17	0.24	0.25	0.26	0.26	0.06	0.11	0.35	0.14
SF_6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emissions of NF3 - (kt CO2 equivalent)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
NF3	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO

Notes:

All footnotes for this table are given on sheet 3 of table 1(d).

Table 1(d) LIE_BR5_v0.1

Emission trends (HFCs, PFCs and SF_6)

(Sheet 3 of 3)

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Change from base to latest reported year
												%
Emissions of HFCs and PFCs - (kt CO2 equivalent)	9.01	9.50	9.85	9.80	10.06	10.15	9.76	10.03	10.20	9.74	9.11	8,625,373.57
Emissions of HFCs - (kt CO2 equivalent)	8.95	9.44	9.81	9.75	10.03	10.13	9.76	10.03	10.20	9.73	9.11	8,624,277.58
HFC-23	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
HFC-32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00
HFC-41	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
HFC-43-10mee	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
HFC-125	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00
HFC-134	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
HFC-134a	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3,674,886.78
HFC-143	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
HFC-143a	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00
HFC-152	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
HFC-152a	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00
HFC-161	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
HFC-227ea	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00
HFC-236cb	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
HFC-236ea	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
HFC-236fa	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
HFC-245ca	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
HFC-245fa	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
HFC-365mfc	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00
Unspecified mix of HFCs(4) - (kt CO_2 equivalent)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
Emissions of PFCs - (kt CO2 equivalent)	0.05	0.06	0.04	0.04	0.03	0.01	0.01	0.00	0.00	0.00	0.00	100.00
CF_4	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
C_2F_6	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
C_3F_8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00
C_4F_{10}	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
c-C_4F_8	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
C_5F_{12}	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
C_6F_{14}	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
C10F18	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
c-C3F6	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
Unspecified mix of PFCs(4) - (kt CO_2 equivalent)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
Unspecified mix of HFCs and PFCs - (kt CO2 equivalent)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
Emissions of SF6 - (kt CO2 equivalent)	0.02	0.01	0.00	0.17	0.12	0.04	0.01	0.05	0.07	0.05	0.05	100.00
SF_6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00
Emissions of NF3 - (kt CO2 equivalent)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
NF3	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00

Abbreviations : CRF = common reporting format, LULUCF = land use, land-use change and forestry.

[a] The column "Base year" should be filled in only by those Parties with economies in transition that use a base year different from 1990 in accordance with the relevant decisions of the Conference of the Parties. For these Parties, this different base year is used to calculate the percentage change in the final column of this table.

[c]Enter actual emissions estimates. If only potential emissions estimates are available, these should be reported in this table and an indication for this be provided in the documentation box. Only in these rows are the emissions expressed as CO2 equivalent emissions.

[d]In accordance with the "Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual inventories", HFC and PFC emissions should be reported for each relevant chemical. However, if it is not possible to report values for each chemical (i.e. mixtures, confidential data, lack of disaggregation), this row could be used for reporting aggregate figures for HFCs and PFCs, respectively. Note that the unit used for this row is kt of CO2 equivalent and that appropriate notation keys should be entered in the cells for the individual chemicals.)

Custom Footnotes

For further information please refer to chapter 3 of Liechtenstein's Eighth National Communication.

3. Quantified Economy-wide Emission Reduction Target (QEWER)

Liechtenstein's quantified economy-wide emission reduction target

Liechtenstein's quantified economy-wide emission reduction target is -20% of its 1990 total GHG emissions by 2020.

Table 2(a) LIE_BR5_v0.1

Description of quantified economy-wide emission reduction target: base year[a]

Party	*Liechtenstein*	
Base year /base period	1990	
Emission reduction target	% of base year/base period 20.00	% of 1990 [b]
Period for reaching target	BY-2020	

[a] Reporting by a developed country Party on the information specified in the common tabular format does not prejudge the position of other Parties with regard to the treatment of units from market-based mechanisms under the Convention or other market-based mechanisms towards achievement of quantified economy-wide emission reduction targets.

[b] Optional.

Table 2(b) LIE_BR5_v0.1

Description of quantified economy-wide emission reduction target: gases and sectors covered[a]

Gases covered		*Base year for each gas (year):*
CO_2		1990
CH_4		1990
N_2O		1990
HFCs		1990
PFCs		1990
SF_6		1990
NF_3		
Other Gases (specify)		
Sectors covered[b]	Energy	Yes
	Transport[f]	Yes
	Industrial processes[g]	Yes
	Agriculture	Yes
	LULUCF	Yes
	Waste	Yes
	Other Sectors (specify)	

Abbreviations : LULUCF = land use, land-use change and forestry.

[a] Reporting by a developed country Party on the information specified in the common tabular format does not prejudge the position of other Parties with regard to the treatment of units from market-based mechanisms under the Convention or other market-based mechanisms towards achievement of quantified economy-wide emission reduction targets.

[b] More than one selection will be allowed. If Parties use sectors other than those indicated above, the explanation of how these sectors relate to the sectors defined by the IPCC should be provided.

[f] Transport is reported as a subsector of the energy sector.

[g] Industrial processes refer to the industrial processes and solvent and other product use sectors.

Table 2(c) LIE_BR5_v0.1

Description of quantified economy-wide emission reduction target: global warming potential values (GWP)[a]

Gases	*GWP values* [b]
CO_2	4th AR
CH_4	4th AR
N_2O	4th AR
HFCs	4th AR
PFCs	4th AR
SF_6	4th AR
NF_3	
Other Gases (specify)	

Abbreviations : GWP = global warming potential

[a] Reporting by a developed country Party on the information specified in the common tabular format does not prejudge the position of other Parties with regard to the treatment of units from market-based mechanisms under the Convention or other market-based mechanisms towards achievement of quantified economy-wide emission reduction targets.

[b] Please specify the reference for the GWP: Second Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) or the Fourth Assessment Report of the IPCC.

Table 2(d) LIE_BR5_v0.1

Description of quantified economy-wide emission reduction target: approach to counting emissions and removals from the LULUCF sector[a]

Role of LULUCF	LULUCF in base year level and target	Included
	Contribution of LULUCF is calculated using	Land-based approach

Abbreviation : LULUCF = land use, land-use change and forestry.

[a] Reporting by a developed country Party on the information specified in the common tabular format does not prejudge the position of other Parties with regard to the treatment of units from market-based mechanisms under the Convention or other market-based mechanisms towards achievement of quantified economy-wide emission reduction targets.

First commitment period 2008-2012 of Kyoto Protocol

For the first commitment period of the Kyoto Protocol (2008-2012) Liechtenstein made a quantified emission limitation and reduction commitment of 92 per cent of the base year level (1990).

The True-Up Period report submitted by Liechtenstein on 2. January 2016[2] contains the information required to be reported upon the expiration of the additional period for fulfilling the commitments for the first commitment period of the Kyoto Protocol in accordance with the relevant decisions of the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol.

Second commitment period 2013-2020 of Kyoto Protocol

Liechtenstein's quantified emission limitation and reduction commitment in the second commitment period (2013-2020) is 84 per cent of the base year (1990). This is in line with Liechtenstein's quantified economy wide target of 20% below 1990 levels in 2020.

Regarding the achievement of the abovementioned target, the priority remains on implementing domestic measures. The legal framework ensuring the focus on domestic reduction measures has been transferred into the new Emissions Trading Act in September 2012. Liechtenstein's focus lies on domestic emission reductions, international carbon credits will play a subsidiary role.

Article 4 paragraph 1 states:

"The emissions of GHG have to be reduced by 20 % compared to the year 1990 until 2020. In accordance with international obligations the Government may increase its reduction target by 40%. The Government informs the Parliament about any increase of the target.

Article 4 paragraph 2 states:

"The reduction of GHG emissions shall be achieved through respective domestic measures, in particular through policy measures within the field of energy, transportation, environment, forestry, agriculture, economy and finance."

Article 4 paragraph 3 states:

"Only these GHG emissions which cannot be reduced by domestic measures, in order to fulfil the reduction obligation according to paragraph 1, may be reduced by using project based mechanisms abroad or international emissions trading."

Use of international market based mechanisms

Liechtenstein will continue the use of carbon credits generated from international market mechanisms to ensure the achievement of the national reduction target. However, Liechtenstein's climate policy generally aims to achieve the reduction target through domestic reductions.

A revision of the Emissions Trading Act is expected to be adopted in spring 2023, in which the domestic reduction target will be defined alongside the reduction target cap to be achieved through measures defined under Article 6 of the Paris agreement.

Liechtenstein will decide on the final modalities pertaining to the use of carbon credits when issuing the true-up report for the second commitment period of the Kyoto Protocol.

During COP 18 in 2012 in Doha, Qatar, Liechtenstein declared not to acquire AAUs for compliance purposes under the second commitment period of the Kyoto Protocol (FCCC/KP/CMP/2012/L.9).

[2] True-up period report Liechtenstein (OE, 2016): https://www.llv.li/files/au/true-up-period-report-by-liechtenstein.pdf

Liechtenstein may, however, use a limited amount of its own AAUs to be carried over in the second commitment period (see Table 2 (e)I).

Table 2(e)I LIE_BR5_v0.1

Description of quantified economy-wide emission reduction target: market-based mechanisms under the Convention[a]

Market-based mechanisms under the Convention	*Possible scale of contributions (estimated kt CO_2 eq)*
CERs	314.00
ERUs	
AAUs[i]	
Carry-over units[j]	42.98
Other mechanism units under the Convention (specify)[d]	

Abbreviations: AAU = assigned amount unit, CER = certified emission reduction, ERU = emission reduction unit.

[a] Reporting by a developed country Party on the information specified in the common tabular format does not prejudge the position of other Parties with regard to the treatment of units from market-based mechanisms under the Convention or other market-based mechanisms towards achievement of quantified economy-wide emission reduction targets.

[d] As indicated in paragraph 5(e) of the guidelines contained in annex I of decision 2/CP.17 .

[i] AAUs issued to or purchased by a Party.

[j] Units carried over from the first to the second commitment periods of the Kyoto Protocol, as described in decision 13/CMP.1 and consistent with decision 1/CMP.8.

Table 2(e)II LIE_BR5_v0.1

Description of quantified economy-wide emission reduction target: other market-based mechanisms[a]

Other market-based mechanisms (Specify)	*Possible scale of contributions (estimated kt CO_2 eq)*

[a] Reporting by a developed country Party on the information specified in the common tabular format does not prejudge the position of other Parties with regard to the treatment of units from market-based mechanisms under the Convention or other market-based mechanisms towards achievement of quantified economy-wide emission reduction targets.

Table 2(f) LIE_BR5_v0.1

Description of quantified economy-wide emission reduction target: any other information[a,b]

No source of NF3 in Liechtenstein

[a] Reporting by a developed country Party on the information specified in the common tabular format does not prejudge the position of other Parties with regard to the treatment of units from market-based mechanisms under the Convention or other market-based mechanisms towards achievement of quantified economy-wide emission reduction targets.

[b] This information could include information on the domestic legal status of the target or the total assigned amount of emission units for the period for reaching a target. Some of this information is presented in the narrative part of the biennial report.

Custom Footnotes

4. Progress in achievement of QEWER target

Mitigation actions and their effects in Liechtenstein

Liechtenstein has implemented its climate related policies and measures strongly into individual sectorial policies. The responsibility of monitoring the effects of individual measures or policies is therefore beard by the respective administration offices that are in charge of the execution of the individual measure. These authorities provide an annual report of their activities (not only climate change related) which will be forwarded to the Liechtenstein Parliament. The reports are publicly available.

Liechtenstein's legislative and administrative main arrangements to meet its commitments under the Kyoto Protocol are to be found in the Emissions Trading Act and the CO_2 Act.

The third measure in the CO_2 Act obliges entities which import (motor) fuels ("Treibstoffe") to compensate a share of up to 40% of the domestic emissions of these fuels.

In alignment with the planned comprehensive revision of the Swiss CO_2 Act, Liechtenstein planned to revise its CO_2 Act entering into force in 2022, in order to achieve the set climate targets for 2030 and 2050 (see Emissions Trading Act). However, since the revised Swiss CO_2 Act was rejected in the Swiss popular referendum, the revision of the Liechtenstein CO_2 Act was put on hold as well. The existing measures have been prolonged until 2025, when the new revision is expected to be adopted.

The CO_2 Act corresponds with the CO_2 Act of Switzerland (in force since 2008) and introduces a levy on the consumption of fossil fuel (oil and natural gas). In 2013 the CO2 Act has been revised. Besides the levy on fossil fuel an obligation to compensate CO_2 emissions from the use of motor fuels (gasoline and diesel) as well as emission regulations for passenger cars has been introduced.

The CO_2 Act is part of "The bilateral Agreement between the Principality of Liechtenstein and the Swiss Confederation on Environmental Levies within the Principality of Liechtenstein".

The Emissions Trading Act provides the basis for the coordination of different sectors on climate measures, the framework for the purchase of emission reduction units abroad, etc. The CO_2 Act is coordinated on the basis of the bilateral treaty on environmental levies between Liechtenstein and Switzerland through the relevant Swiss authorities.

The revised draft of the Emissions Trading Act (EHG) foresees to reduce emissions by 50% by 2030. In addition, it states that emission reductions are first and foremost to be achieved by domestic measures and sets the minimum domestic reduction target with 40%. If the reduction obligations cannot be fulfilled through domestic measures the Government may participate in project activities abroad or in international emissions trading. Liechtenstein is currently assessing the establishment of bilateral agreements as stipulated under Article 6.2 of the Paris agreement. Liechtenstein is associated to the emission trading directive of the European Commission and will join the discussion of the EC around operationalising Article 6.4 of the Paris agreement. However, it is unlikely that significant progress on the latter will be made prior to 2024.

The Energy Efficiency Act and the Energy Strategy 2030 serve as central drivers for the achievement of Liechtenstein's GHG reduction targets until 2030:

The **Energy Efficiency Act** (2008) and the relevant Ordinance (2008) as well as the Energy Ordinance (2007) on the Construction Act constitute the legal framework for the implementation of measures relating to buildings. In terms of measurable mitigation action, the most relevant measures are to be found in the energy sector, since over 80 % of Liechtenstein's CO_2 emissions are energy related. Measured against the reference year 1990, the emissions in this sector must be eliminated reduced by around 50% by 2030 reaching net zero by 2050. An ambitious goal that requires comprehensive measures, high investments and the support from all sectors: politics, the economy and individuals. The increase of energy efficiency and in particular the increased use of renewable energies are of central importance for the reduction of greenhouse gas emissions and accordingly for a long-term climate policy.

The Government adopted the "**Energy Strategy 2030**". The strategy provides future-oriented impulses for the national energy policy. The focus areas of the concept are the promotion of efficient energy use, the use of renewable energies, and energy conservation. The main measures outlined in the energy strategy are subsidy for renovation of old buildings, residential heating installations, solar collectors and photovoltaic installations.

The annual publication of Liechtenstein's energy statistics by the Office of Statistics serves as a monitoring tool to evaluate the effect of the respective policies. The Bureau of Energy Consumption and Conservation ('Energiefachstelle') was responsible for the implementation and monitoring of measures set out in the Energy Strategy 2020 and maintains this responsibility for the Energy Strategy 2030. The Bureau uses the energy statistics and its data on approved subsidies to provide annual monitoring reports to Parliament.

For further information please refer to chapter 4 of Liechtenstein's Eighth National Communication.

Table 3 LIE_BR5_v0.1

Progress in achievement of the quantified economy-wide emission reduction target: information on mitigation actions and their effects

Name of mitigation action [a]	*Sector(s) affected* [b]	*GHG(s) affected*	*Objective and/or activity affected*	*Type of instrument* [c]	*Status of implementation* [d]	*Brief description* [e]	*Start year of implementation*	*Implementing entity or entities*	*Estimate of mitigation impact (not cumulative, in kt CO_2 eq)*	
									2020	*2025* [f]
Liechtenstein Energy Strategy 2030 (Energiestrategie 2030)*	Energy, Transport	CO_2	Governmental Strategy that targets a sustainable energy supply, energy efficiency and net zero emissions	Other (Planning measure)	Implemented	Including policies on: Building standards, support for Minergie buildings, district heating network	2020	Government of Liechtenstein / Office of Economic Affairs	2.56	3.49
Climate Strategy 2050	Cross-cutting	CH_4, CO_2, HFCs, N_2O, PFCs, SF_6	Definition of the increase in the emission reduction target for 2030 from 40% to 50% below 1990 and concrete measures to achieve this target and the target of climate neutrality by 2050.	Other (Planning Measure)	Planned		2023	Government of Liechtenstein	NA	22.77

Note: The two final columns specify the year identified by the Party for estimating impacts (based on the status of the measure and whether an ex post or ex ante estimation is available).

Abbreviations: GHG = greenhouse gas; LULUCF = land use, land-use change and forestry.

[a] Parties should use an asterisk (*) to indicate that a mitigation action is included in the 'with measures' projection.

[b] To the extent possible, the following sectors should be used: energy, transport, industry/industrial processes, agriculture, forestry/LULUCF, waste management/waste, other sectors, cross-cutting, as appropriate.

[c] To the extent possible, the following types of instrument should be used: economic, fiscal, voluntary agreement, regulatory, information, education, research, other.

[d] To the extent possible, the following descriptive terms should be used to report on the status of implementation: implemented, adopted, planned.

[e] Additional information may be provided on the cost of the mitigation actions and the relevant timescale.

[f] Optional year or years deemed relevant by the Party.

Custom Footnotes

Estimates of emission reductions and removals and the use of units from the market-based mechanisms and LULUCF

Information on progress in the achievement of the quantified economy-wide emission reduction targets is provided in BR CTF Table4.

Liechtenstein's base year (1990) emissions and the Kyoto Target 2020 (assigned amount units) are defined in the report on the review of the report to facilitate the calculation of the assigned amount for the second commitment period of the Kyoto Protocol of Liechtenstein[3]. Due to recalculations the base year emissions may differ from the values Liechtenstein reported for the year 1990 in its latest greenhouse gas inventory.

Information on the effective quantity of units from market based mechanisms under the Convention is provided in Table 4(b).

With the transition from Kyoto to Paris mechanisms Liechtenstein is not using the mechanisms described under 6.4 of the Paris agreement prior to 2024. However, Liechtenstein is currently assessing the use of bilateral agreements under Article 6.2 to achieve its emission reduction target until 2030.

Table 4 LIE_BR5_v0.1

Reporting on progress[a, b]

	Total emissions excluding LULUCF (1)	*Contribution from LULUCF*[d] *(2)*	*Quantity of units from market based mechanisms under the Convention*		*Quantity of units from other market based mechanisms*	
Year[c]	*(kt CO_2 eq)*	*(kt CO_2 eq)*	*(number of units)*	*(kt CO_2 eq)*	*(number of units)*	*(kt CO_2 eq)*
Base year/period (1990)	231.55		NA	NA	NA	
2010	228.17		NA		NA	
2011	215.32		NA		NA	
2012	224.51		NA		NA	
2013	230.73		0.00		NA	
2014	199.73		0.00		NA	
2015	198.15		0.00		NA	
2016	187.76		0.00		NA	
2017	193.46		209,603.00		NA	
2018	181.27		50,938.00		NA	
2019	187.67		53,463.00		NA	
2020	180.01		0.00		NA	

Abbreviation: GHG = greenhouse gas, LULUCF = land use, land-use change and forestry.

[a] Reporting by a developed country Party on the information specified in the common tabular format does not prejudge the position of other Parties with regard to the treatment of units from market-based mechanisms under the Convention or other market-based mechanisms towards achievement of quantified economy-wide emission reduction targets.

[b] For the base year, information reported on the emission reduction target shall include the following: (a) total GHG emissions, excluding emissions and removals from the LULUCF sector; (b) emissions and/or removals from the LULUCF sector based on the accounting approach applied taking into consideration any relevant decisions of the Conference of the Parties and the activities and/or land that will be accounted for; (c) total GHG emissions, including emissions and removals from the LULUCF sector. For each reported year, information reported on progress made towards the emission reduction targets shall include, in addition to the information noted in paragraphs 9(a–c) of the UNFCCC biennial reporting guidelines for developed country Parties, information on the use of units from market-based mechanisms.

[c] Parties may add additional rows for years other than those specified below.

[d] Information in this column should be consistent with the information reported in table 4(a)I or 4(a)II, as appropriate. The Parties for which all relevant information on the LULUCF contribution is reported in table 1 of this common tabular format can refer to table 1.

Custom Footnotes

(1) Liechtenstein's base year (1990) emissions are defined in the report on the review of the report to facilitate the calculation of the assigned amount for the second commitment period of the Kyoto Protocol of Liechtenstein. Due to recalculations the base year emissions may differ from the values Liechtenstein reported for the year 1990 in its latest greenhouse gas inventory.

(2) Refer to Table 1

[3] Liechtenstein. Report on the review of the report to facilitate the calculation of the assigned amount for the second commitment period of the Kyoto Protocol of Liechtenstein. Note by the expert review team. https://unfccc.int/documents/28242

Table 4(a)I LIE_BR5_v0.1

Progress in achieving the quantified economy-wide emission reduction targets – further information on mitigation actions relevant to the contribution of the land use, land-use change and forestry sector in 2019 [a,b]

	Net GHG emissions/removals from LULUCF categories [c]	*Base year/period or reference level value* [d]	*Contribution from LULUCF for reported year*	*Cumulative contribution from LULUCF* [e]	*Accounting approach* [f]
	(kt CO_2 eq)				
Total LULUCF					Land-based approach
A. Forest land					Land-based approach
1. Forest land remaining forest land					Land-based approach
2. Land converted to forest land					Land-based approach
3. Other [g]					Land-based approach
B. Cropland					Land-based approach
1. Cropland remaining cropland					Land-based approach
2. Land converted to cropland					Land-based approach
3. Other [g]					Land-based approach
C. Grassland					Land-based approach
1. Grassland remaining grassland					Land-based approach
2. Land converted to grassland					Land-based approach
3. Other [g]					Land-based approach
D. Wetlands					Land-based approach
1. Wetland remaining wetland					Land-based approach
2. Land converted to wetland					Land-based approach
3. Other [g]					Land-based approach
E. Settlements					Land-based approach
1. Settlements remaining settlements					Land-based approach
2. Land converted to settlements					Land-based approach
3. Other [g]					Land-based approach
F. Other land					Land-based approach
1. Other land remaining other land					Land-based approach
2. Land converted to other land					Land-based approach
3. Other [g]					Land-based approach
G. Other					Land-based approach
Harvested wood products					Land-based approach

Abbreviations: GHG = greenhouse gas, LULUCF = land use, land-use change and forestry.

[a] Reporting by a developed country Party on the information specified in the common tabular format does not prejudge the position of other Parties with regard to the treatment of units from market-based mechanisms under the Convention or other market-based mechanisms towards achievement of quantified economy-wide emission reduction targets.

[b] Parties that use the LULUCF approach that is based on table 1 do not need to complete this table, but should indicate the approach in table 2. Parties should fill in a separate table for each year, namely 2011 and 2012, where 2014 is the reporting year.

[c] For each category, enter the net emissions or removals reported in the most recent inventory submission for the corresponding inventory year. If a category differs from that used for the reporting under the Convention or its Kyoto Protocol, explain in the biennial report how the value was derived.

[d] Enter one reference level or base year/period value for each category. Explain in the biennial report how these values have been calculated.

[e] If applicable to the accounting approach chosen. Explain in this biennial report to which years or period the cumulative contribution refers to.

[f] Label each accounting approach and indicate where additional information is provided within this biennial report explaining how it was implemented, including all relevant accounting parameters (i.e. natural disturbances, caps).

[g] Specify what was used for the category "other". Explain in this biennial report how each was defined and how it relates to the categories used for reporting under the Convention or its Kyoto Protocol.

Custom Footnotes

Table 4(a)I LIE_BR5_v0.1

Progress in achieving the quantified economy-wide emission reduction targets – further information on mitigation actions relevant to the contribution of the land use, land-use change and forestry sector in 2020 [a, b]

	Net GHG emissions/removals from LULUCF categories [c]	*Base year/period or reference level value* [d]	*Contribution from LULUCF for reported year*	*Cumulative contribution from LULUCF* [e]	*Accounting approach* [f]
	(kt CO_2 eq)				
Total LULUCF					Land-based approach
A. Forest land					Land-based approach
1. Forest land remaining forest land					Land-based approach
2. Land converted to forest land					Land-based approach
3. Other [g]					Land-based approach
B. Cropland					Land-based approach
1. Cropland remaining cropland					Land-based approach
2. Land converted to cropland					Land-based approach
3. Other [g]					Land-based approach
C. Grassland					Land-based approach
1. Grassland remaining grassland					Land-based approach
2. Land converted to grassland					Land-based approach
3. Other [g]					Land-based approach
D. Wetlands					Land-based approach
1. Wetland remaining wetland					Land-based approach
2. Land converted to wetland					Land-based approach
3. Other [g]					Land-based approach
E. Settlements					Land-based approach
1. Settlements remaining settlements					Land-based approach
2. Land converted to settlements					Land-based approach
3. Other [g]					Land-based approach
F. Other land					Land-based approach
1. Other land remaining other land					Land-based approach
2. Land converted to other land					Land-based approach
3. Other [g]					Land-based approach
G. Other					Land-based approach
Harvested wood products					Land-based approach

Abbreviations: GHG = greenhouse gas, LULUCF = land use, land-use change and forestry.

[a] Reporting by a developed country Party on the information specified in the common tabular format does not prejudge the position of other Parties with regard to the treatment of units from market-based mechanisms under the Convention or other market-based mechanisms towards achievement of quantified economy-wide emission reduction targets.

[b] Parties that use the LULUCF approach that is based on table 1 do not need to complete this table, but should indicate the approach in table 2. Parties should fill in a separate table for each year, namely 2011 and 2012, where 2014 is the reporting year.

[c] For each category, enter the net emissions or removals reported in the most recent inventory submission for the corresponding inventory year. If a category differs from that used for the reporting under the Convention or its Kyoto Protocol, explain in the biennial report how the value was derived.

[d] Enter one reference level or base year/period value for each category. Explain in the biennial report how these values have been calculated.

[e] If applicable to the accounting approach chosen. Explain in this biennial report to which years or period the cumulative contribution refers to.

[f] Label each accounting approach and indicate where additional information is provided within this biennial report explaining how it was implemented, including all relevant accounting parameters (i.e. natural disturbances, caps).

[g] Specify what was used for the category "other". Explain in this biennial report how each was defined and how it relates to the categories used for reporting under the Convention or its Kyoto Protocol.

Custom Footnotes

Table 4(a)II

LIE_BR5_v0.1
Source: Submission 2022 v3, LIECHTENSTEIN

Progress in achievement of the quantified economy-wide emission reduction targets – further information on mitigation actions relevant to the counting of emissions and removals from the land use, land-use change and forestry sector in relation to activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol[a,b,c]

GREENHOUSE GAS SOURCE AND SINK ACTIVITIES	*Base year*[d]	*Net emissions/removals*[e]									*Accounting parameters*[h]	*Accounting quantity*[i]
		2013	2014	*2015*	*2016*	2017	2018	2019	2020	Total[g]		
	(kt CO_2 eq)											
A. Article 3.3 activities												
A.1. Afforestation/reforestation		-0.32	-0.32	-0.33	-0.33	-0.34	-0.34	-0.35	-0.35	-2.67		-2.67
Excluded emissions from natural disturbances(5)			NO	NO	NO	NO	NO	NO		NO		NO
Excluded subsequent removals from land subject to natural disturbances(6)			NO	NO	NO	NO		NO	NO	NO		NO
A.2. Deforestation		4.68	4.77	4.87	4.96	4.80	4.63	4.46	4.29	37.47		37.47
B. Article 3.4 activities												
B.1. Forest management										16.15		13.27
Net emissions/removalse		5.67	5.58	0.14	-1.72	-0.04	11.33	1.34	-6.15	16.15		
Excluded emissions from natural disturbances(5)			NO		NO	NO	NO	NO		NO		NO
Excluded subsequent removals from land subject to natural disturbances(6)			NO		NO	NO	NO	NO	NO	NO		NO
Any debits from newly established forest (CEF-ne)(7),(8)												
Forest management reference level (FMRL)(9)											0.10	
Technical corrections to FMRL(10)											0.26	
Forest management capl											66.09	13.27
B.2. Cropland management (if elected)			NO		NO	NO	NO	NO	NO	NO		NO
B.3. Grazing land management (if elected)			NO		NO	NO	NO	NO	NO	NO		NO
B.4. Revegetation (if elected)			NO		NO	NO	NO	NO	NO	NO		NO
B.5. Wetland drainage and rewetting (if elected)			NO		NO	NO	NO	NO	NO	NO		NO

Note: 1 kt CO_2 eq equals 1 Gg CO_2 eq.

Abbreviations: CRF = common reporting format, LULUCF = land use, land-use change and forestry.

[a] Reporting by a developed country Party on the information specified in the common tabular format does not prejudge the position of other Parties with regard to the treatment of units from market-based mechanisms under the Convention or other market-based mechanisms towards achievement of quantified economy-wide emission reduction targets.

[b] Developed country Parties with a quantified economy-wide emission reduction target as communicated to the secretariat and contained in document FCCC/SB/2011/INF.1/Rev.1 or any update to that document, that are Parties to the Kyoto Protocol, may use table 4(a)II for reporting of accounting quantities if LULUCF is contributing to the attainment of that target.

[c] Parties can include references to the relevant parts of the national inventory report, where accounting methodologies regarding LULUCF are further described in the documentation box or in the biennial reports.

[d] Net emissions and removals in the Party's base year, as established by decision 9/CP.2.

[e] All values are reported in the information table on accounting for activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, of the CRF for the relevant inventory year as reported in the current submission and are automatically entered in this table.

[f] Additional columns for relevant years should be added, if applicable.

[g] Cumulative net emissions and removals for all years of the commitment period reported in the current submission.

[h] The values in the cells "3.3 offset" and "Forest management cap" are absolute values.

[i] The accounting quantity is the total quantity of units to be added to or subtracted from a Party's assigned amount for a particular activity in accordance with the provisions of Article 7, paragraph 4, of the Kyoto Protocol.

[j] In accordance with paragraph 4 of the annex to decision 16/CMP.1, debits resulting from harvesting during the first commitment period following afforestation and reforestation since 1990 shall not be greater than the credits accounted for on that unit of land.

[k] In accordance with paragraph 10 of the annex to decision 16/CMP.1, for the first commitment period a Party included in Annex I that incurs a net source of emissions under the provisions of Article 3 paragraph 3, may account for anthropogenic greenhouse gas emissions by sources and removals by sinks in areas under forest management under Article 3, paragraph 4, up to a level that is equal to the net source of emissions under the provisions of Article 3, paragraph 3, but not greater than 9.0 megatonnes of carbon times five, if the total anthropogenic greenhouse gas emissions by sources and removals by sinks in the managed forest since 1990 is equal to, or larger than, the net source of emissions incurred under Article 3, paragraph 3.

[l] In accordance with paragraph 11 of the annex to decision 16/CMP.1, for the first commitment period of the Kyoto Protocol only, additions to and subtractions from the assigned amount of a Party resulting from Forest management under Article 3, paragraph 4, after the application of paragraph 10 of the annex to decision 16/CMP.1 and resulting from forest management project activities undertaken under Article 6, shall not exceed the value inscribed in the appendix of the annex to decision 16/CMP.1, times five.

Custom Footnotes

Table 4(b) LIE_BR5_v0.1

Reporting on progress[a, b, c]

Units of market based mechanisms			*Year*	
			2019	*2020*
Kyoto Protocol units[d]	*Kyoto Protocol units*	*(number of units)*	53463	0
		(kt CO_2 eq)		
	AAUs	*(number of units)*		
		(kt CO2 eq)		
	ERUs	*(number of units)*		
		(kt CO2 eq)		
	CERs	*(number of units)*	53463	0
		(kt CO2 eq)		
	tCERs	*(number of units)*		
		(kt CO2 eq)		
	lCERs	*(number of units)*		
		(kt CO2 eq)		
Other units[d,e]	*Units from market-based mechanisms under the Convention*	*(number of units)*		
		(kt CO_2 eq)		
	Units from other market-based mechanisms	*(number of units)*		
		(kt CO_2 eq)		
Total		*(number of units)*	53463	0
		(kt CO_2 eq)		

Abbreviations : AAUs = assigned amount units, CERs = certified emission reductions, ERUs = emission reduction units, lCERs = long-term certified emission reductions, tCERs = temporary certified emission reductions.
Note: 2011 is the latest reporting year.

[a] Reporting by a developed country Party on the information specified in the common tabular format does not prejudge the position of other Parties with regard to the treatment of units from market-based mechanisms under the Convention or other market-based mechanisms towards achievement of quantified economy-wide emission reduction targets.

[b] For each reported year, information reported on progress made towards the emission reduction target shall include, in addition to the information noted in paragraphs 9(a-c) of the reporting guidelines, on the use of units from market-based mechanisms.

[c] Parties may include this information, as appropriate and if relevant to their target.

[d] Units surrendered by that Party for that year that have not been previously surrendered by that or any other Party.

[e] Additional rows for each market-based mechanism should be added, if applicable.

Custom Footnotes

For further information please refer to chapter 4 of Liechtenstein's Eighth National Communication.

5. Projections

This section covers Liechtenstein's greenhouse gas emissions under the three scenarios 'without measures' (WOM), 'with measures' (WM) and 'with additional measures' (WAM) according to the guidelines for the preparation of national communications (UNFCCC 2019):

- The 'without measures' (WOM) scenario projection excludes all policies and measures implemented, adopted or planned after the year chosen as the starting point for that projection. For Liechtenstein's NC8, this starting year is 2008. 2008 was the year when the Energy Efficiency Act was adopted in Liechtenstein, and no other (quantifiable) measures were implemented earlier than 2008 in Liechtenstein.
- The 'with measures' (WM) scenario projection encompasses currently implemented and adopted policies and measures. In Liechtenstein, projections based on specific measures are only available for the sector Energy (1A Fuel combustion). For the waste sector projections were calculated based on past emissions and the expected growth in population. Projections for the sectors Energy (1B Fugitive emissions from fuels) as well as for IPPU (2) and Agriculture (3) were adopted from Switzerland's WM projection in its NC8 (FOEN 2022). The projections for LULUCF were assumed to be constant (mean of the latest five inventory years). The projection of international bunkers is also assumed to be constant (mean of last 10 years; note that within the last 10 years, only minor fluctuations occurred in reported emissions).
- The 'with additional measures' (WAM) scenario projection also encompasses planned policies and measures. The Climate Strategy 2050 (Government 2022) defines additional measures for the sectors Energy, IPPU, Agriculture and Waste. Projections under the WAM scenario are therefore adopted from the Climate Strategy 2050.

The energy sector dominates Liechtenstein's greenhouse gas emissions. In the year 2020, emissions from this sector amounted 80.1% of Liechtenstein's total emissions. Therefore, the focus for the elaboration of Liechtenstein's projections in its NC8 lies on the Energy sector.

The aggregated projections in CO_2 equivalents under the WM and WAM scenario are depicted in the following tables. The actual GHG emission reduction for the years 1990–2020 amounts 21.4%. From then, further reductions by 30.5% (WM scenario) and by 46.30% (WAM scenario) are projected in the years 2020–2035. The total reduction from 1990–2035 under the WM scenario is anticipated to be 45.4%, for the WAM scenario 57.8%. As CTF Tables 6a-c only show projections up to the year 2030, the projections for the year 2035 are shown in a separate Table below.

Table 5 LIE_BR5_v0.1

Summary of key variables and assumptions used in the projections analysis[a]

Key underlying assumptions		*Historical*[b]											Projected		
Assumption	*Unit*	*1990*	*1995*	2000	2005	2010	2015	2016	2017	2018	2019	2020	2025	2030	2035
Population	*thousands*	29.03	30.92	32.86	34.91	36.15	37.62	37.81	38.11	38.38	38.75	39.06	40.35	41.42	42.55

[a] Parties should include key underlying assumptions as appropriate.

[b] Parties should include historical data used to develop the greenhouse gas projections reported.

Custom Footnotes

Table 6(a) LIE_BR5_v0.1

Information on updated greenhouse gas projections under a 'with measures' scenario[a]

	GHG emissions and removals[b] *(kt CO_2 eq)*								GHG emission projections ($kt CO_2$ eq)	
	Base year (1990)	1990	1995	2000	2005	2010	2015	2019	2020	2030
Sector[d,e]										
Energy	124.38	124.38	124.96	128.44	149.64	115.67	100.33	94.16	91.54	69.79
Transport	76.87	76.87	82.10	91.62	81.81	77.76	61.85	57.36	52.77	44.54
Industry/industrial processes	0.66	0.66	1.77	4.41	7.49	9.39	10.48	10.05	9.43	4.95
Agriculture	24.90	24.90	23.10	20.91	23.07	23.73	23.87	24.50	24.67	24.49
Forestry/LULUCF	7.57	7.57	5.33	25.14	9.39	21.01	12.21	12.40	4.84	12.35
Waste management/waste	1.66	1.66	1.62	1.62	1.63	1.62	1.62	1.60	1.60	1.81
Other (specify)										
Gas										
CO_2 emissions including net CO_2 from LULUCF	206.24	206.24	209.24	241.66	237.99	211.42	171.55	161.02	146.39	123.53
CO_2 emissions excluding net CO_2 from LULUCF	198.97	198.97	204.20	216.86	228.99	190.83	159.77	149.03	141.94	112.17
CH_4 emissions including CH_4 from LULUCF	19.24	19.24	17.92	16.69	18.49	19.01	19.01	19.57	19.71	19.62
CH_4 emissions excluding CH_4 from LULUCF	19.24	19.24	17.92	16.69	18.49	19.01	19.01	19.57	19.71	19.62
N_2O emissions including N_2O from LULUCF	10.57	10.57	10.47	9.83	9.51	9.70	9.60	9.70	9.58	9.96
N_2O emissions excluding N_2O from LULUCF	10.27	10.27	10.18	9.48	9.12	9.29	9.17	9.30	9.19	8.96
HFCs	0.00	0.00	1.24	3.87	6.73	8.95	10.13	9.73	9.11	4.78
PFCs	NO	NO	0.00	0.01	0.05	0.05	0.01	0.00	0.00	0.00
SF_6	NO	NO	NO	0.09	0.26	0.02	0.04	0.05	0.05	0.03
NF_3	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Other (specify)										
Total with LULUCF[f]	236.05	236.05	238.87	272.15	273.03	249.15	210.34	200.07	184.84	157.92
Total without LULUCF	228.48	228.48	233.54	247.00	263.64	228.15	198.13	187.68	180.00	145.56

Abbreviations : GHG = greenhouse gas, LULUCF = land use, land-use change and forestry.

[a] In accordance with the "Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part II: UNFCCC reporting guidelines on national communications", at a minimum Parties shall report a 'with measures' scenario, and may report 'without measures' and 'with additional measures' scenarios. If a Party chooses to report 'without measures' and/or 'with additional measures' scenarios they are to use tables 6(b) and/or 6(c), respectively. If a Party does not choose to report 'without measures' or 'with additional measures' scenarios then it should not include tables 6(b) or 6(c) in the biennial report.

[b] Emissions and removals reported in these columns should be as reported in the latest GHG inventory and consistent with the emissions and removals reported in the table on GHG emissions and trends provided in this biennial report. Where the sectoral breakdown differs from that reported in the GHG inventory Parties should explain in their biennial report how the inventory sectors relate to the sectors reported in this table.

[c] 20XX is the reporting due-date year (i.e. 2014 for the first biennial report).

[d] In accordance with paragraph 34 of the "Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part II: UNFCCC reporting guidelines on national communications", projections shall be presented on a sectoral basis, to the extent possible, using the same sectoral categories used in the policies and measures section. This table should follow, to the extent possible, the same sectoral categories as those listed in paragraph 17 of those guidelines, namely, to the extent appropriate, the following sectors should be considered: energy, transport, industry, agriculture, forestry and waste management.

[e] To the extent possible, the following sectors should be used: energy, transport, industry/industrial processes, agriculture, forestry/LULUCF, waste management/waste, other sectors (i.e. cross-cutting), as appropriate.

[f] Parties may choose to report total emissions with or without LULUCF, as appropriate.

Custom Footnotes

GHG emissions projections in kt CO2eq	2035
Sector	
Energy	61.89
Transport	35.10
Industry/industrial processes	4.26
Agriculture	24.49
Forestry/LULUCF	12.35
Waste management/waste	1.90
Other (specify)	
Gases	
CO_2 emissions including net CO_2 from LULUCF	106.36
CO_2 emissions excluding net CO_2 from LULUCF	95.00
CH_4 emissions including CH_4 from LULUCF	19.63
CH_4 emissions excluding CH_4 from LULUCF	19.63
N_2O emissions including N_2O from LULUCF	9.85
N_2O emissions excluding N_2O from LULUCF	8.86
HFCs	4.11
PFCs	0.00
SF_6	0.02
NF_3	NO
Other (specify)	
Total with LULUCF [f]	139.98
Total without LULUCF	127.63

Table 6(b) LIE_BR5_v0.1

Information on updated greenhouse gas projections under a 'without measures' scenario [a]

	GHG emissions and removals [b] (*kt CO_2 eq*)								GHG emission projections ($kt CO_2$ eq)	
	Base year (1990)	1990	1995	2000	2005	2010	2015	2019	2020	2030
Sector [d,e]										
Energy	124.38	124.38	124.96	128.44	149.64	133.30	138.19	141.58	142.42	142.88
Transport	76.87	76.87	82.10	91.62	81.81	84.09	80.60	80.93	81.02	81.58
Industry/industrial processes	0.66	0.66	1.77	4.41	7.49	9.97	12.25	12.50	12.82	13.65
Agriculture	24.90	24.90	23.10	20.91	23.07	23.73	23.87	24.50	24.67	24.55
Forestry/LULUCF	7.57	7.57	5.33	25.14	9.39	21.01	12.21	12.40	4.84	12.35
Waste management/waste	1.66	1.66	1.62	1.62	1.63	1.67	1.79	1.88	1.90	2.10
Other (specify)										
Gas										
CO_2 emissions including net CO_2 from LULUCF	206.24	206.24	209.24	241.66	237.99	235.09	227.30	230.84	224.28	231.75
CO_2 emissions excluding net CO_2 from LULUCF	198.97	198.97	204.20	216.86	228.99	214.50	215.52	218.84	219.83	220.39
CH_4 emissions including CH_4 from LULUCF	19.24	19.24	17.92	16.69	18.49	19.25	19.66	20.46	20.66	21.16
CH_4 emissions excluding CH_4 from LULUCF	19.24	19.24	17.92	16.69	18.49	19.25	19.66	20.46	20.66	21.16
N_2O emissions including N_2O from LULUCF	10.57	10.57	10.47	9.83	9.51	9.84	10.04	10.32	10.26	10.94
N_2O emissions excluding N_2O from LULUCF	10.27	10.27	10.18	9.48	9.12	9.42	9.61	9.92	9.87	9.94
HFCs	0.00	0.00	1.24	3.87	6.73	9.51	11.85	12.11	12.38	13.19
PFCs	NO	NO	0.00	0.01	0.05	0.06	0.02	0.00	0.00	0.00
SF_6	NO	NO	NO	0.09	0.26	0.02	0.04	0.06	0.07	0.08
NF_3	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Other (specify)										
Total with LULUCF [f]	236.05	236.05	238.87	272.15	273.03	273.77	268.91	273.79	267.65	277.12
Total without LULUCF	228.48	228.48	233.54	247.00	263.64	252.76	256.70	261.39	262.81	264.76

Abbreviations : GHG = greenhouse gas, LULUCF = land use, land-use change and forestry.

[a] In accordance with the "Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part II: UNFCCC reporting guidelines on national communications", at

[b] Emissions and removals reported in these columns should be as reported in the latest GHG inventory and consistent with the emissions and removals reported in the table on GHG emissions and trends provided in this biennial report. Where the sectoral breakdown differs from that reported in the GHG inventory Parties should explain in their biennial report how the inventory sectors relate to the sectors reported in this table.

[c] 20XX is the reporting due-date year (i.e. 2014 for the first biennial report).

[d] In accordance with paragraph 34 of the "Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part II: UNFCCC reporting guidelines on national communications", projections shall be presented on a sectoral basis, to the extent possible, using the same sectoral categories used in the policies and measures section. This table should follow, to the extent possible, the same sectoral categories as those listed in paragraph 17 of those guidelines, namely, to the extent appropriate, the following sectors should be considered: energy, transport, industry, agriculture, forestry and waste management.

[e] To the extent possible, the following sectors should be used: energy, transport, industry/industrial processes, agriculture, forestry/LULUCF, waste management/waste, other sectors (i.e. cross-cutting), as appropriate.

[f] Parties may choose to report total emissions with or without LULUCF, as appropriate.

Custom Footnotes

GHG emissions projections in kt CO2eq	2035
Sector	
Energy	143.11
Transport	81.58
Industry/industrial processes	14.31
Agriculture	24.55
Forestry/LULUCF	12.35
Waste management/waste	2.21
Other (specify)	
Gases	
CO_2 emissions including net CO_2 from LULUCF	231.76
CO_2 emissions excluding net CO_2 from LULUCF	220.40
CH_4 emissions including CH_4 from LULUCF	21.45
CH_4 emissions excluding CH_4 from LULUCF	21.45
N_2O emissions including N_2O from LULUCF	10.99
N_2O emissions excluding N_2O from LULUCF	9.99
HFCs	13.83
PFCs	0.00
SF_6	0.08
NF_3	NO
Other (specify)	
Total with LULUCF [f]	278.11
Total without LULUCF	265.75

Table 6(c) LIE_BR5_v0.1

Information on updated greenhouse gas projections under a 'with additional measures' scenario[a]

	GHG emissions and removals[b] (*kt CO_2 eq*)								GHG emission projections (kt CO_2 eq)	
	Base year (1990)	1990	1995	2000	2005	2010	2015	2019	2020	2030
Sector [d,e]										
Energy	124.38	124.38	124.96	128.44	149.64	115.67	100.33	94.16	91.54	60.20
Transport	76.87	76.87	82.10	91.62	81.81	77.76	61.85	57.36	52.77	42.55
Industry/industrial processes	0.66	0.66	1.77	4.41	7.49	9.39	10.48	10.05	9.43	4.53
Agriculture	24.90	24.90	23.10	20.91	23.07	23.73	23.87	24.50	24.67	20.07
Forestry/LULUCF	7.57	7.57	5.33	25.14	9.39	21.01	12.21	12.40	4.84	12.35
Waste management/waste	1.66	1.66	1.62	1.62	1.63	1.62	1.62	1.60	1.60	1.76
Other (specify)										
Gas										
CO_2 emissions including net CO_2 from LULUCF	206.24	206.24	209.24	241.66	237.99	211.42	171.55	161.02	146.39	112.04
CO_2 emissions excluding net CO_2 from LULUCF	198.97	198.97	204.20	216.86	228.99	190.83	159.77	149.03	141.94	100.69
CH_4 emissions including CH_4 from LULUCF	19.24	19.24	17.92	16.69	18.49	19.01	19.01	19.57	19.71	16.48
CH_4 emissions excluding CH_4 from LULUCF	19.24	19.24	17.92	16.69	18.49	19.01	19.01	19.57	19.71	16.48
N_2O emissions including N_2O from LULUCF	10.57	10.57	10.47	9.83	9.51	9.70	9.60	9.70	9.58	8.53
N_2O emissions excluding N_2O from LULUCF	10.27	10.27	10.18	9.48	9.12	9.29	9.17	9.30	9.19	7.53
HFCs	0.00	0.00	1.24	3.87	6.73	8.95	10.13	9.73	9.11	4.37
PFCs	NO	NO	0.00	0.01	0.05	0.05	0.01	0.00	0.00	0.00
SF_6	NO	NO	NO	0.09	0.26	0.02	0.04	0.05	0.05	0.03
NF_3	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Other (specify)										
Total with LULUCF[f]	236.05	236.05	238.87	272.15	273.03	249.15	210.34	200.07	184.84	141.45
Total without LULUCF	228.48	228.48	233.54	247.00	263.64	228.15	198.13	187.68	180.00	129.10

Abbreviations : GHG = greenhouse gas, LULUCF = land use, land-use change and forestry.

[a] In accordance with the "Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part II: UNFCCC reporting guidelines on national communications", at a minimum Parties shall report a 'with measures' scenario, and may report 'without measures' and 'with additional measures' scenarios. If a Party chooses to report 'without measures' and/or 'with additional measures' scenarios they are to use tables 6(b) and/or 6(c), respectively. If a Party does not choose to report 'without measures' or 'with additional measures' scenarios then it should not include tables 6(b) or 6(c) in the biennial report.

[b] Emissions and removals reported in these columns should be as reported in the latest GHG inventory and consistent with the emissions and removals reported in the table on GHG emissions and trends provided in this biennial report. Where the sectoral breakdown differs from that reported in the GHG inventory Parties should explain in their biennial report how the inventory sectors relate to the sectors reported in this table.

[c] 20XX is the reporting due-date year (i.e. 2014 for the first biennial report).

[d] In accordance with paragraph 34 of the "Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part II: UNFCCC reporting guidelines on national communications", projections shall be presented on a sectoral basis, to the extent possible, using the same sectoral categories used in the policies and measures section. This table should follow, to the extent possible, the same sectoral categories as those listed in paragraph 17 of those guidelines, namely, to the extent appropriate, the following sectors should be considered: energy, transport, industry, agriculture, forestry and waste management.

[e] To the extent possible, the following sectors should be used: energy, transport, industry/industrial processes, agriculture, forestry/LULUCF, waste management/waste, other sectors (i.e. cross-cutting), as appropriate.

[f] Parties may choose to report total emissions with or without LULUCF, as appropriate.

Custom Footnotes

GHG emissions projections in kt CO2eq	2035
Sector	
Energy	49.72
Transport	29.11
Industry/industrial processes	2.02
Agriculture	18.05
Forestry/LULUCF	12.35
Waste management/waste	1.82
Other (specify)	
Gases	
CO_2 emissions including net CO_2 from LULUCF	88.34
CO_2 emissions excluding net CO_2 from LULUCF	76.98
CH_4 emissions including CH_4 from LULUCF	15.05
CH_4 emissions excluding CH_4 from LULUCF	15.05
N_2O emissions including N_2O from LULUCF	7.73
N_2O emissions excluding N_2O from LULUCF	6.73
HFCs	1.95
PFCs	0.00
SF_6	0.01
NF_3	NO
Other (specify)	
Total with LULUCF [f]	113.07
Total without LULUCF	100.72

For further information please refer to chapter 5 of Liechtenstein's Eighth National Communication.

6. Provision of financial, technological and capacity-building support to developing country Parties

According to the biennial reporting guidelines the reporting obligations concerning financial, technological and capacity-building support to developing country parties only apply to Annex II Parties to the Convention (see FCCC/CP/2011/9/Add.1, Annex I, Chapter VI). Since Liechtenstein is not listed in Annex II to the Convention the Government does not consider itself to be bound by the respective provisions.

However, due to Liechtenstein's activities within the Fast Start Finance Period 2010 to 2012 as well as with regard to the Government decision of 2012 to continue its engagement within the framework of international climate finance Liechtenstein has chosen to report these activities under paragraph 25, Chapter 7 "Other Reporting matters".

With respect to future submissions Liechtenstein aims at using that reporting format and opportunity to also address the request by Parties made in conjunction with the work program on long term finance at COP 19 in Warsaw[4].

[4] see paragraph 10 http://unfccc.int/resource/docs/2013/cop19/eng/10a01.pdf

7. Other reporting elements

Liechtenstein's emissions measurements, reporting and verification and emission projections

Liechtenstein accounts yearly for the national greenhouse gas inventory (NIR).

The annual publication of Liechtenstein's energy statistics by the Office of Statistics serves as a monitoring tool to evaluate the effect of the respective policies. The Bureau of Energy Consumption and Conservation ('Energiefachstelle') was responsible for the implementation and monitoring of measures set out in the Energy Strategy 2020 and maintains this responsibility for the Energy Strategy 2030. The Bureau uses the energy statistics and its data on approved subsidies to provide annual monitoring reports to Parliament.

Liechtenstein's activities within international climate finance

Liechtenstein's climate finance priorities are elaborated upon in detail in its Eighth National Communication chapter 7.

As an Annex 1 country, Liechtenstein does not have any obligation to participate in the mandatory funding arrangements. Nevertheless, Liechtenstein is in per capita calculations amongst top donors in climate financing. In 2021, Liechtenstein's IHCD had resources of about 22.9 million Swiss francs, i.e. about 580 Swiss francs per capita. The total Official Development Assistance (ODA) amount was 25.5 million Swiss francs. The average exchange rate for USD was 0.914 in 2021.

In 2015, the Parliament decided to give permanence to the climate finance commitment and integrated climate finance into the regular budget of the International Humanitarian Cooperation and Development IHCD.

In general, support is given to development country partners to help them both adapt to and mitigate the effects of climate change. For the sake of performance and efficiency, Liechtenstein prefers a bilateral allocation of climate finance projects. Therefore, the realisation of projects is focused on traditional cooperation partners under the umbrella of the Mountain Partnership or partners of the Liechtenstein Development Service (LED).

Liechtenstein's **adaptation** assistance focuses on improving resilience to extreme weather conditions and other hazards, by investing in infrastructure which can better withstand climate change impacts, and through other practical measures to help local communities be more prepared.

To assist in **mitigating** climate change, Liechtenstein is placing emphasis on supporting energy efficiency programmes and renewable energy systems in the Caucasus, Central Asia and African countries. Liechtenstein strives to allocate these official funds in a balanced manner by supporting climate projects, which are reflecting recipient needs as regards sustainable development and which are politically supported by respective authorities.

The Office of Environment is also represented in the Life climate fund as well as the Swiss climate fund, which are both supporting innovative projects in the areas of adaption and mitigating climate change, mainly at national level but with selected projects of international outreach.

Liechtenstein will also join further discussions on the Loss & Damage Fund, which was widely discussed the COP27 in Sharm El Sheik. While it is unclear yet, if it comes with mandatory obligations for Annex 1 countries, Liechtenstein may anyway consider contributing to the Loss & Damage Fund in the future.

Liechtenstein is also a strong supporter of broadening the donor base in climate finance.
With regard to the implementation of efficient and effective development policies, both partnerships and networks are indispensable: partnerships, which for their mutual benefit are embracing governments, institutions and civil society. Such Public Private Partnerships (PPP) with their potential for mobilizing private funds and knowledge in order to carry out governmental obligations and at the same time making best use of each partners strengths must much more determine successful environment and development policies in future as they do today.

For further information please refer to chapter 7 of Liechtenstein's Eighth National Communication.