REPUBLIC OF LEBANON
MINISTRY OF ENVIRONMENT

LEBANON'S EXPERIENCE

In using IPCC inventory softwares

BEIRUT . AUGUST 2024
LEA KAI- GHG INVENTORY COMPILER

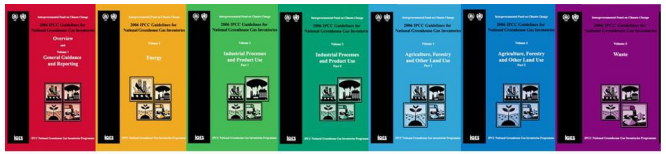
National Context

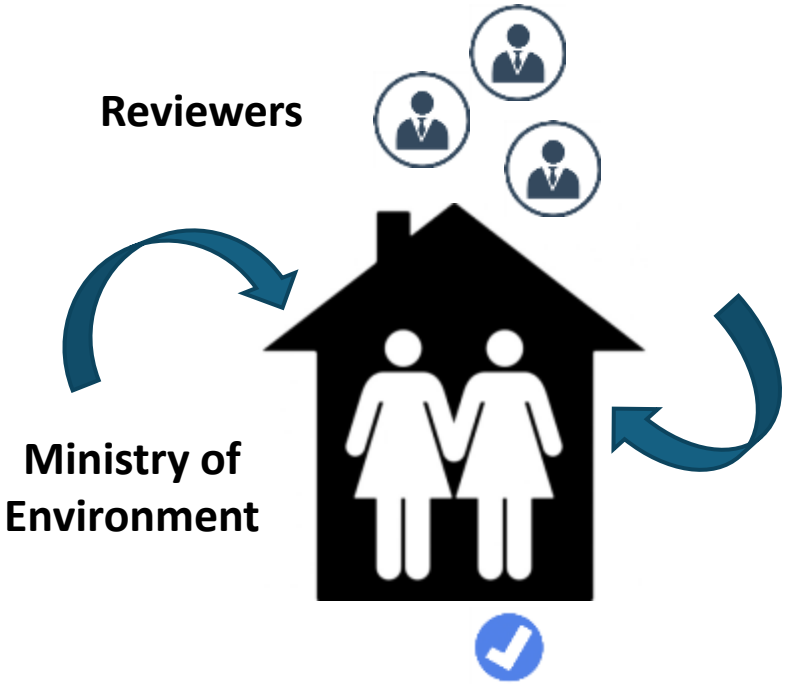
4 national communications
(1999, 2011,2016, 2022)
4 BURs
(2015,2017, 2019,2021)

Revised 1996 IPCC guidelines

Revised 2006 IPCC guidelines – starting BUR3 and NC3

BTR 1 to be submitted in December 2024
Using the 2006 IPCC GL
and the IPCC software 2.93





Compilation team

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IPCC inventory 2.69
1999-2022

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In line with 1996/2006 IPCC guidelines

Embedded EFs and parameters- validates chosen defaults EFs

Easy time series function for recalculations

Easy create new year based on a previous year

Intensive capacity building sessions and peer-to-peer learning

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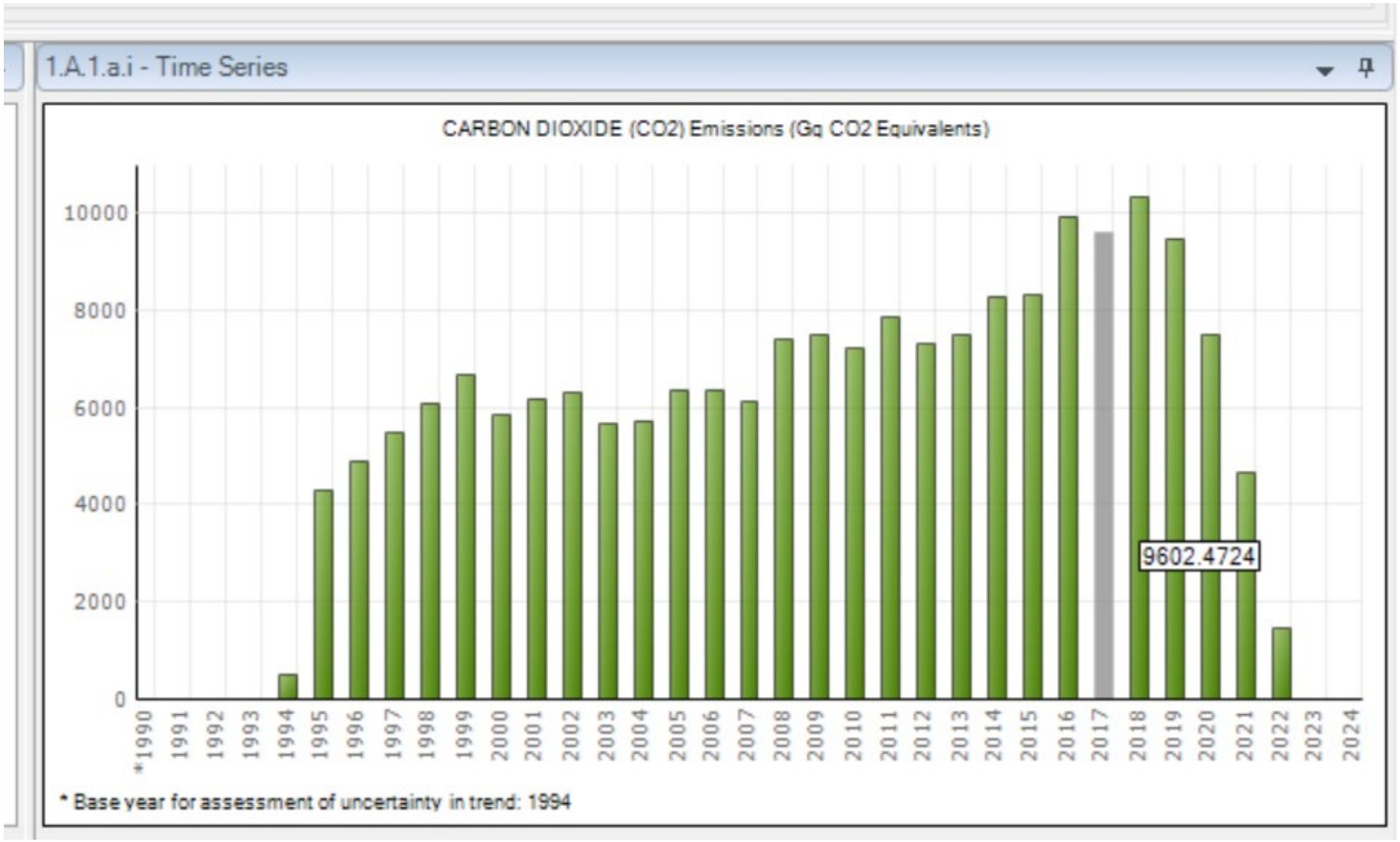
No embedded default values for uncertainties

F-gases Tier 2 very complicated – no function of adding manually totals calculated externally

No trend data – will have to be done manually on excel sheets

No automatic calculation of CO_2 equivalent in totals


1.A.1.a.i - Time Series
CARBON DIOXIDE (CO2) Emissions (Gg CO2 Equivalents)
10000
8000
6000
4000
2000
0
9602.4724
*1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
* Base year for assessment of uncertainty in trend: 1994

Gg CO2 eq	Energy	% growth	co2	ch4	n2o	Transport	% Growth	co2	ch4	n2o	Energy total	% Growth	co2	ch4	n2o
1994	**4,624**		4,605	10	9	**1,296**		1265	14.3	16.23	**5,919.17**		5870	24.17	25
1995	**8,153**	76%	8,124	13	16	**1,428**	10%	1394	15.6	18.2	**9,580.90**	62%	9518	28.9	34
1996	**8,412**	3%	8,383	13	16	**1,597**	12%	1559	16.9	20.8	**10,009.00**	4%	9942	30	37
1997	**8,666**	3%	8,636	13	17	**1,782**	12%	1740	18.2	23.6	**10,448.00**	4%	10376	31	41
1998	**8,920**	3%	8,889	14	18	**1,946**	9%	1900	19.24	26.4	**10,866.00**	4%	10789	33	44
1999	**10,808**	21%	10,769	17	22	**2,094**	8%	2045	20.09	29	**12,902.00**	19%	12814	37	51
2000	**9,469**	-12%	9,436	14	19	**2,219**	6%	2167	20.76	31.38	**11,688.00**	-9%	11603	35	50
2001	**10,873**	15%	10,834	18	22	**2,366**	7%	2310	21.49	34.1	**13,239.00**	13%	13144	39	56
2002	**10,434**	-4%	10,397	16	21	**2,512**	6%	2453	22.18	36.9	**12,946.00**	-2%	12850	38	58
2003	**9,269**	-11%	9,236	14	18	**2,659**	6%	2597	22.87	39.6	**11,928.00**	-8%	11833	37	58
2004	**9,486**	2%	9,453	14	19	**2,849**	7%	2782	23.6	43.28	**12,335.00**	3%	12235	38	62
2005	**9,096**	-4%	9,064	14	18	**3,026**	6%	2955	24.5	46.7	**12,122.00**	-2%	12019	38	65
2006	**9,348**	3%	9,317	13	18	**3,204**	6%	3129	25.26	50.1	**12,552.00**	4%	12446	38	68
2007	**8,209**	-12%	8,181	12	17	**3,407**	6%	3326	26.21	54.46	**11,616.00**	-7%	11507	38	71
2008	**10,012**	22%	9,979	13	20	**3,705**	9%	3617	27.6	60.3	**13,717.00**	18%	13596	41	80
2009	**13,263**	32%	13,209	28	26	**4,120**	11%	4022	29.5	68.6	**17,383.00**	27%	17231	57	95
2010	**11,055**	-17%	11,016	18	22	**4,558**	11%	4449	31.5	77.25	**15,613.00**	-10%	15465	49	99
2011	**12,268**	11%	12,220	24	24	**4,890**	7%	4773	32.9	83.89	**17,158.00**	10%	16993	57	108
2012	**13,973**	14%	13,922	24	28	**5,221**	7%	5096	34.5	90.5	**19,194.00**	12%	19018	58	118
2013	**14,925**	7%	14,871	25	29	**5,537**	6%	5404	35.9	96.79	**20,462.00**	7%	20275	61	126
2014	**15,670**	5%	15,613	26	31	**5,870**	6%	5729	37.5	103	**21,539.00**	5%	21342	63	134
2015	**16,604**	6%	16,542	29	33	**6,221**	6%	6072	39.1	110.2	**22,825.00**	6%	22614	68	143
2016	**19,245**	16%	19,173	33	39	**6,592**	6%	6434	40.89	117.38	**25,836.79**	13%	25607	73.59	156.2
2017	**18,449**	-4%	18,381	31	37	**7,013**	6%	6845	42.84	125.43	**25,462.70**	-1%	25226	74	162.7
2018	**19,297**	5%	19,226	32	39	**7,404**	6%	7226	44.7	132.9	**26,700.79**	5%	26452	76.9	171.89
2019	**16,552**	-14%	16,491	28	33	**7,665**	4%	7480.96	46.02	137.89	**24,217.22**	-9%	23972.32	73.7	171.2
2020	**(4,825)**	-129%	(4,886)	30	32	**4,999**	-35%	4886.26	30.73	81.83	**174.27**	-99%		60.53	113.74
2021	**(5,191)**	8%	(5,235)	22	22	**5,356**	7%	5235	32.62	88.04	**164.22**	-6%		54.34	109.88
2022	**9,962**	-292%	9,919	23	20	**6,663**	24%	6,509.72	41.24	111.64	**16,624.78**	10023%	16,428.80	64.54	131.44
	2,745	4%	**3.592182**	**2.928065**	**3.740023**	**4.802127315**	7%				**averge increase**	4%			
							5.714726791								
	40%					**13%**					**31%**				

Categories	Net CO2	CH4	N2O	CH4 Co2 eq	N2O Co2 eq	F-gases CO2 eq	Total emissions	NET emissions
Total National Emissions and Removals	**22,191.73**	**78.85**	**2.84**	**2,207.78**	**751.46**	**1,877.75**	**30,089.63**	**27,028.72**
1 - Energy	**23,872.32**	**2.63**	**0.65**	**73.70**	**171.20**		**24,117.22**	
1.A - Fuel Combustion Activities	**23,872.32**	**2.63**	**0.65**	**73.70**	**171.20**		**24,117.22**	26,839.46
1.A.1 - Energy Industries	9,362.41	0.37	0.07	10.35	19.59		9,392.34	
1.A.2 - Manufacturing Industries and Construction	3,514.68	0.13	0.03	3.69	6.97		3,525.34	
1.A.3 - Transport	7,480.96	1.64	0.52	46.02	137.98		7,664.96	
1.A.4 - Other Sectors	3,514.27	0.49	0.03	13.64	6.67		3,534.58	
1.A.5 - Non-Specified	-	-	-	-	-		-	
1.B - Fugitive emissions from fuels	-	-	-	-	-		-	
1.B.1 - Solid Fuels	-	-	-	-	-		-	
1.B.2 - Oil and Natural Gas	-	-	-	-	-		-	
1.B.3 - Other emissions from Energy Production	-	-	-	-	-		-	
1.C - Carbon dioxide Transport and Storage	-	-	-	-	-		-	
1.C.1 - Transport of CO2	-			-	-		-	
1.C.2 - Injection and Storage	-			-	-		-	
1.C.3 - Other	-			-	-		-	
2 - Industrial Processes and Product Use	**1,339.03**	-	**0.13**	-	**33.39**	**1,877.75**	**3,250.17**	
2.A - Mineral Industry	**1,338.52**	-	-	-	-	-	**1,338.52**	
2.A.1 - Cement production	1,336.56			-	-		1,336.56	
2.A.2 - Lime production	0.75			-	-		0.75	
2.A.3 - Glass Production	-			-	-		-	
2.A.4 - Other Process Uses of Carbonates	1.21			-	-		1.21	
3 - Agriculture, Forestry, and Other Land Use	**(3,052.25)**	**17.82**	**1.54**	**498.91**	**406.92**		**914.49**	(2,146.42)
3.A - Livestock	-	**17.75**	**0.41**	**497.08**	**107.95**	-	**605.03**	
3.A.1 - Enteric Fermentation		14.39		402.90	-		402.90	
3.A.2 - Manure Management		3.36	0.41	94.18	107.95		202.13	
3.B - Land	**(3,060.91)**	-	-	-	-		**(3,060.91)**	
3.B.1 - Forest land	(1,897.80)			-	-		(1,897.80)	
3.B.2 - Cropland	(1,219.94)			-	-		(1,219.94)	
3.B.3 - Grassland	-			-	-		-	
3.B.4 - Wetlands	-		-	-	-		-	
3.B.5 - Settlements	56.82			-	-		56.82	
3.B.6 - Other Land	-			-	-		-	
3.C - Aggregate sources and non-CO2 emissions sources on land	**8.66**	**0.07**	**1.13**	**1.82**	**298.98**		**309.46**	
3.C.1 - Emissions from biomass burning		0.07	0.00	1.82	0.98		2.81	
3.C.2 - Liming	-			-	-		-	
3.C.3 - Urea application	8.66			-	-		8.66	
3.C.4 - Direct N2O Emissions from managed soils			0.75	-	199.94		199.94	
3.C.5 - Indirect N2O Emissions from managed soils			0.28	-	73.15		73.15	
3.C.6 - Indirect N2O Emissions from manure management			0.09	-	24.90		24.90	
3.C.7 - Rice cultivations		-		-	-		-	
3.C.8 - Other (please specify)		-	-	-	-		-	
3.D - Other	-	-	-	-	-	-	-	
3.D.1 - Harvested Wood Products				-	-		-	
3.D.2 - Other (please specify)	-	-	-	-	-		-	
4 - Waste	**32.63**	**58.40**	**0.53**	**1,635.18**	**139.95**		**1,807.75**	
4.A - Solid Waste Disposal	-	30.40	-	851.32	-		851.32	
4.B - Biological Treatment of Solid Waste	-	2.17	0.12	60.65	31.64		92.29	
4.C - Incineration and Open Burning of Waste	32.63	4.71	0.09	131.96	23.51		188.10	
4.D - Wastewater Treatment and Discharge	-	21.12	0.32	591.25	84.80		676.05	

IPCC inventory 2.930
2024

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Not very different than the old version (colors, design, format)

Exportable databases for Energy, IPPU, and Agriculture

Embedded EFs and parameters- validates chosen defaults EFs (2019?)

Exportable CRT tables *(yet to be discovered)*

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Overrides old software and paralyzes old mdb files

No export of LULUCF and waste files

Fuel manager - parameters cannot be different for subcategories

New defaults EFs (waste)

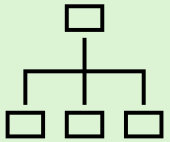
Very short timeframe → Not enough training on the tool

Lesson learnt and best practices

Document and archive data

Always have a back up plan if the software crashes (or new versions invade!)

All AD and Efs with links
Old and new datasets in case of recalculations



One compiler, one user

The lead compiler collects all data and enters them manually in the software

Good QA/QC
Understanding the data
Noticing differences

Specific tasks

Don’t reinvent the wheel and recreate the model on excel

Trust the process!

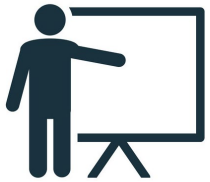
Build and retain capacities

Lead compiler and sectoral experts are regularly trained

Same people sticking around
Mentoring sessions and one-on-ones

Way forward

Trainings and capacity building sessions, even for senior and experienced people



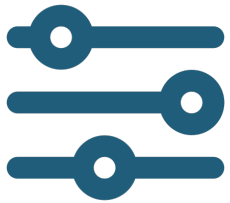
CAPACITY BUILDING

Compliance of any new version with the old datasets

Add the options for:

Manual input in the totals

Export of time series results



Easier documentation- exportable data on sectoral factsheets

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THANK YOU