NATIONAL GHG INVENTORY UNDER VIET NAM'S BUR3

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General Introduction

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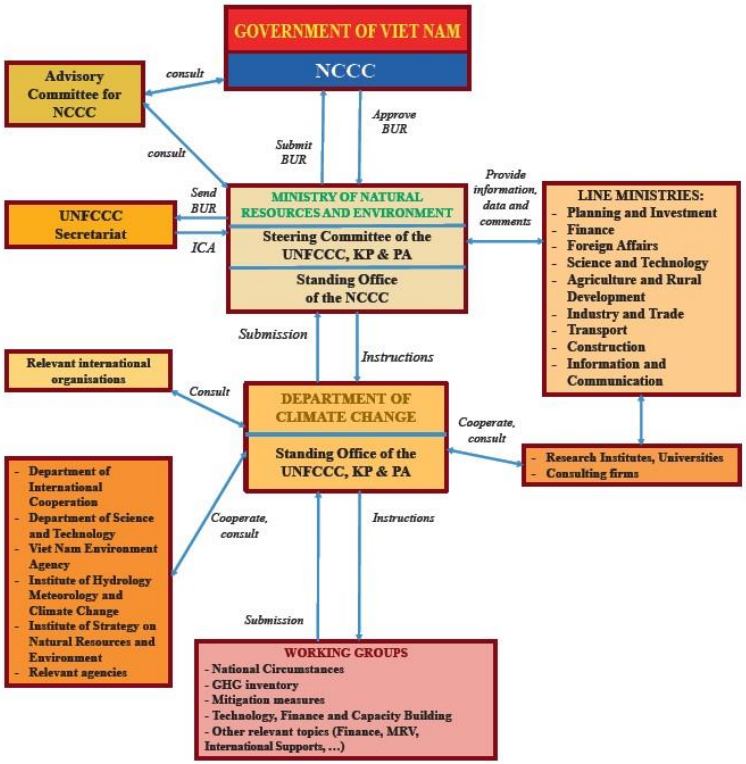
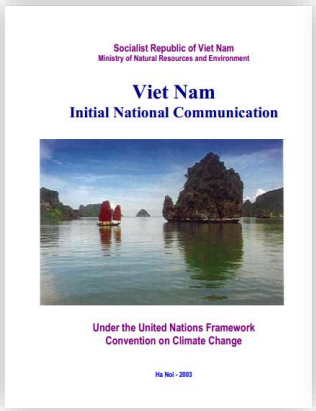
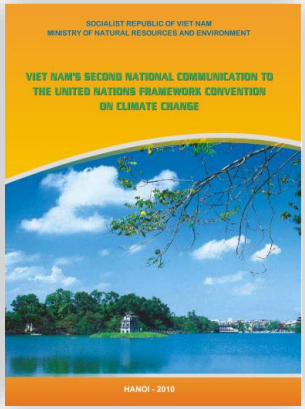
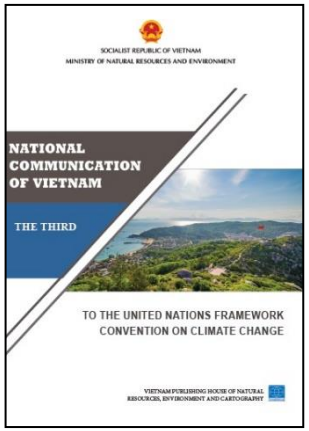
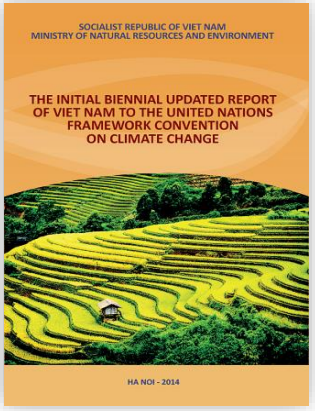
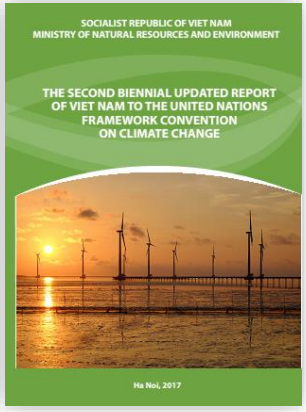


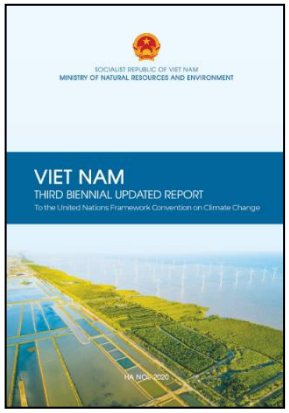








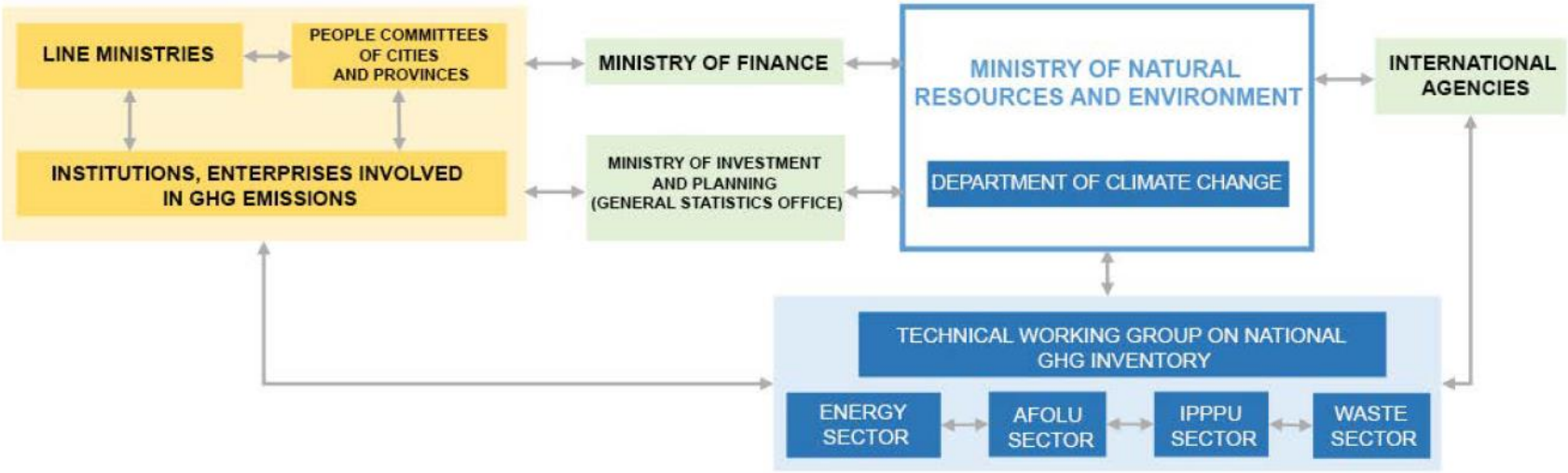




Status of national GHG inventories

National Reports	NC1	NC2	BUR1	BUR2	NC3	BUR3	NC4		BTR1
Inventory year	1994	2000	2010	2013	2014	2016	2018	2020	2022

Institutional arrangement for 2016 national GHG inventories



Methodology

- The 2006 IPCC Guidelines for national GHG inventories
- The 2019 refinement to the 2006 IPPC Guidelines for national GHG inventories
- The Revised 1996 IPCC Guidelines for national GHG inventories
- The IPCC Good practice guidance and uncertainty management in national GHG inventories
- The IPCC Good practice guidance for LULUCF
- ALU software

AD and EFs

1. Energy sector	
Tier	Tier 1, Tier 2 (1B1a)
AD	Viet Nam Energy Balance Sheet
EFs	- CH_4 dispersion coefficient in pit coal mining in Viet Nam, MOIT. - IPCC 2006 default values
2. IPPU sector	
Tier	Tier 1
AD	- Statistical Yearbook - Reports from related Ministries (steel, urea fertiliser, cement, HFCs consumption, nitric acid production, building materials)
EFs	IPCC 2006 default values EFs of SO_2, NO_x, CO and NMVOC in steel production based on the revised 1996 IPCC Guidelines.
3. AFOLU sector	
Tier	Tier 1, Tier 2 (3A2), Tier 3 (3B1)
AD	- Statistical Yearbook - Reports from related Ministries (forest data, Surface coating matrix 2006-2016)
EFs	- Country specific CH_4 EFs for continuously flooded rice fields with organic amendments, Project report for development country specific emission factor by GEF/UNEP, MONRE, 2007 - IPCC 2006 default values
4. Waste sector	
Tier	Tier 1, Tier 2 (4A)
AD	- Statistical Yearbook - National Environment Status Report
EFs	- IPCC 2006 default values

GWP

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Gas		GWP
CO_2		1
CH_4		28
N_2O		265
HFCs	HFC-125	3,170
	HFC-227ea	3,350
	HFC-23	12,400

Results of 2016 national GHG inventory

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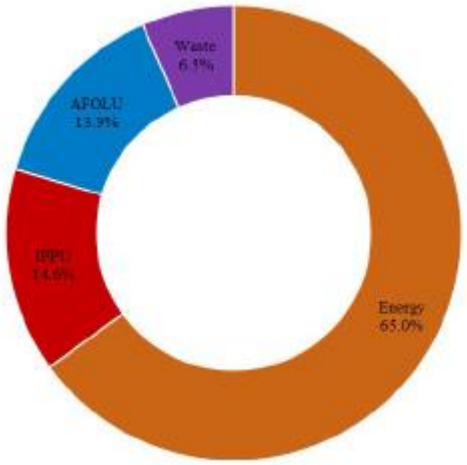
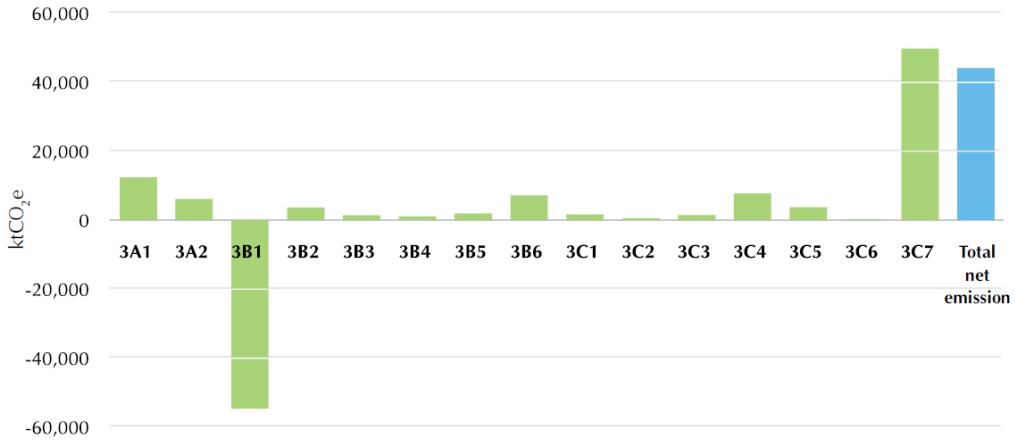
IPCC Code	Sector	CO_2	CH_4	N_2O	HFCs	Total
		$ktCO_2eq$				
Total net emissions		**191,651.08**	**106,838.29**	**18,222.26**	**23.32**	**316,734.96**
1	Energy	182,291.22	22,345.35	1,195.63		205,832.20
2	IPPU	46,047.20		24.12	23.32	46,094.64
3	AFOLU	-37,489.34	66,544.64	15,014.44		44,069.74
4	Waste	802.00	17,948.30	1,988.07		20,738.38





QC

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Scope	Activities
AD	Check AD sources and criteria for selecting AD
	Check the assumptions used due to the lack of AD.
	Check the process of inputting AD and measure units into spreadsheets and inventory tools.
	Check the consistency of AD among sectors.
EFs and parameters	Check the parameters, conversion factors and country-specific EFs used.
	Check the EFs and parameters using IPCC default value.
Calculated results	Check methodology for calculating emissions/removals.
	Check inventory results of sectors for 2016 and recalculated results for year 2010 and 2014.
	Check the completeness, accuracy and consistency according to the IPCC categorisation.
Other contents	Check the results of key category analysis and the uncertainty assessment.
	Check the reporting results according to IPCC 2006 guidelines and templates.

QA

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- Conducted by agency/experts not directly involved in the inventory compilation;
- Inspected and assessed the quality of input data as well as the appropriateness of methodology;
- Supported QC activities;
- Close collaboration among related state management agencies, research institutions, NGOs and sectoral experts;
- 08 Workshops/consultation meetings for GHG inventory in the AFOLU and waste sectors; 05 Workshops/consultation meetings for GHG inventory in the energy and IPPU sectors;
- NIR 2016 was sent to line ministries and agencies involved in the making of BUR3 for official consultation.

KCA

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IPCC Code	Sector	CO_2	CH_4	N_2O	Total
Total key categories		**28**	**11**	**3**	**42**
1	Energy	16	3	0	19
2	IPPU	4	0	0	4
3	AFOLU	8	5	2	15
4	Waste	0	3	1	4

Uncertainty assessment

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IPCC Code	Sector	Emissions/Removals	Uncertainty
		$ktCO_2eq$	%
1	Energy	205,832.20	5.6
2	IPPU	46,094.64	26.9
3	AFOLU	44,069.74	100.2
4	Waste	20,738.38	20.3

Published national GHG inventories

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Unit: $ktCO_2e$

1996 IPCC code	Sector	1994	2000	2010	2013	2014
Total net emissions		**103,839.30**	**150,899.73**	**246,830.65**	**259,024.10**	**283,965.53**
1	Energy	25,637.09	52,773.46	141,170.79	151,402.52	171,621.08
2	IP	3,807.19	10,005.72	21,172.01	31,767.38	38,619.79*
4	Agriculture	52,450.00	65,090.65	88,354.77	89,407.82	89,751.80
5	LULUCF	19,380.00	15,104.72	-19,218.59	-34,239.83	-37,540.18
6	Waste	2,565.02	7,925.18	15,351.67	20,686.21	21,513.04

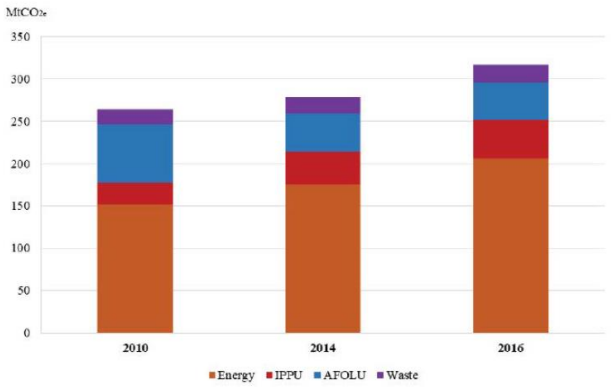
Recalculation

2010

2006 IPCC code	Sector	CO_2	CH_4	N_2O	HFCs	Total net emissions	Difference
		$ktCO_2e$					%
Total net emission		**132,641.81**	**115,801.48**	**15,856.10**	**NE**	**264,210.67**	**7,0**
1	Energy	125,514.57	25,075.17	1,289.33		151,879.06	7.6
2	IPPU	25,844.05		NE	NE	25,844.05	22.1
3	AFOLU	-19,499.85	75,258.07	12,952.60		68,710.82	0.6*
4	Waste	694.48	15,468.18	1,614.08		17,776.73	15.8

2014

2006 IPCC code	Sector	CO_2	CH_4	N_2O	HFCs	Total net emissions	Differ-ence
		$ktCO_2e$					%
Total net emission		**151,930.72**	**109,842.95**	**16,791.01**	**95.01**	**278,659.70**	**1.9***
1	Energy	148,435.33	25,784.95	1,319.91		175,540.20	2.3
2	IPPU	38,637.70		NE	95.01	38,732.71	0.3
3	AFOLU	-35,936.97	67,304.63	13,630.26		44,997.92	13.8*
4	Waste	794.66	16,753.37	1,840.84		19,388.87	9.9*



Improvements

- Apply the the 2006 IPCC Guidelines and the 2019 refinement to the 2006 IPPC Guidelines

Energy	IPPU	AFOLU	Waste
• Emission estimate for the producing charcoal • Detailed AD for manufacturing industries and construction • Updated ethanol and natural gas used in transport.	• Country specific parametter (rate of clinker in cement) for cement production • Detailed AD for ammonia and nitric acid production, import and export clinker.	• Collected data on average livestock weights • Using remote sensing data for calculating emissions/removals from soil and land use conversion • Updated parameters on living biomass and biomass growth, biomass loss factor due to logging of forest types.	• The amount of landfill solid waste was separated into managed sanitary landfill, open landfill and open burning • Some more sub-sectors were calculated: Biological treatment of solid waste; open burning of waste, waste incineration, wastewater treatment and discharge by urban and rural areas.

Constrains and gaps

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- Time and finance
- Familiarity with IPCC 2006 guideline
- Coordination among relevant institutions
- Activity data collection
- Country specific EFs

Lesson learnt

- Allocate a permanent budget for the national GHG inventory
- Maintain the institutional arrangement on a continuous basic
- Legalization of the GHG inventory process in the country for facilitating the AD collection
- Technical assistance and close cooperation with UNEP (international implementing agency)
- Close cooperation between NFP with related Ministries
- Develop the country specific EFs by suitable roadmap
- Learning by doing (2006 IPCC guideline).

Thank you very much for your attention

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