

Nepal's Existing GHG Inventory Arrangement and Way Forward

BUR/BTR

Ministry of Forests and Environment

27 August 2023

Outline of the Presentation

- **Nepal's GHGI**
- **Greenhouse Gas Emissions in Nepal**
- **GHG Inventory Arrangement**
- **Progress, Achievements and National Commitments**
- **Challenges and Limitations**
- **The Way Forward**

Nepal's GHGI

- Nepal- Adopted and become Party to UNFCCC, Rio Earth Summit in June 1992.
- Managed by Ministry of Forests and Environment focal agency to UNFCCC,
- Guided by IPCC Guidelines

GHG inventory as

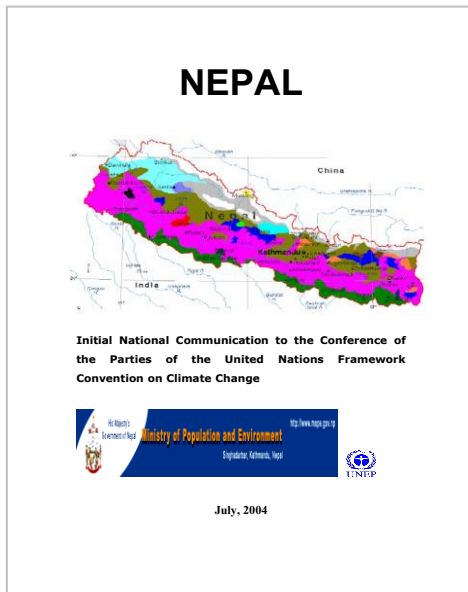
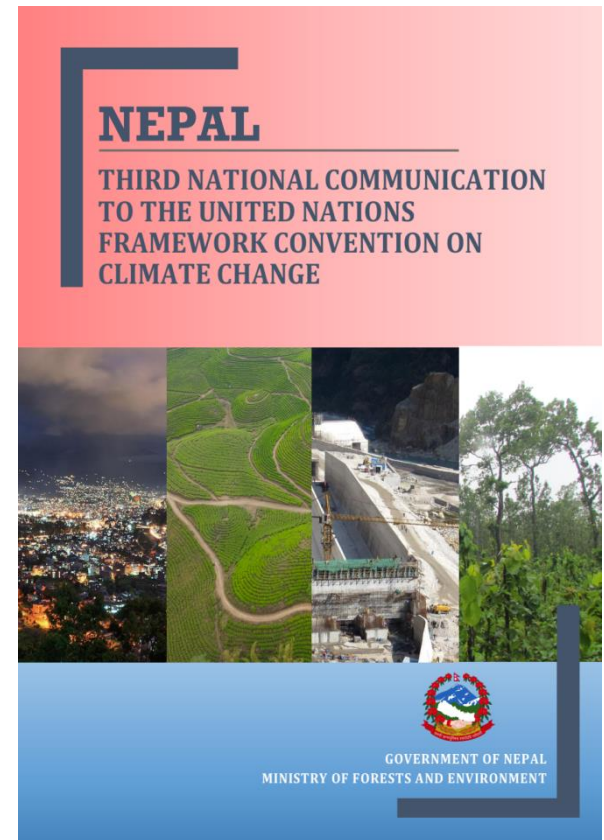
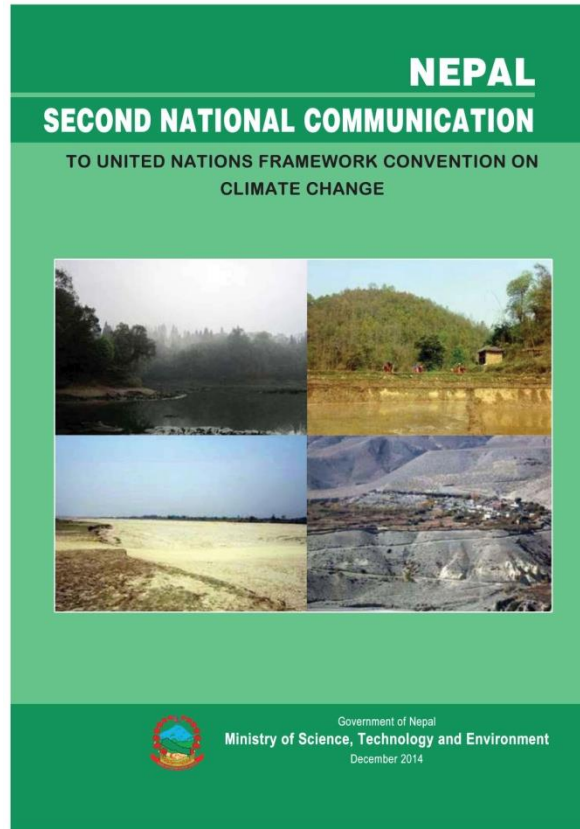
- ✓ Initial National Communication → July 2004
- ✓ Second National Communication → December 2014
- ✓ Third National Communication → June 2021

National GHG Inventory Report,

- ✓ 1990-91: in 1997
- ✓ 1994-95: INC
- ✓ 2000-01: SNC
- ✓ 2010-11:TNC

Second, December 2014

Third, June 2021



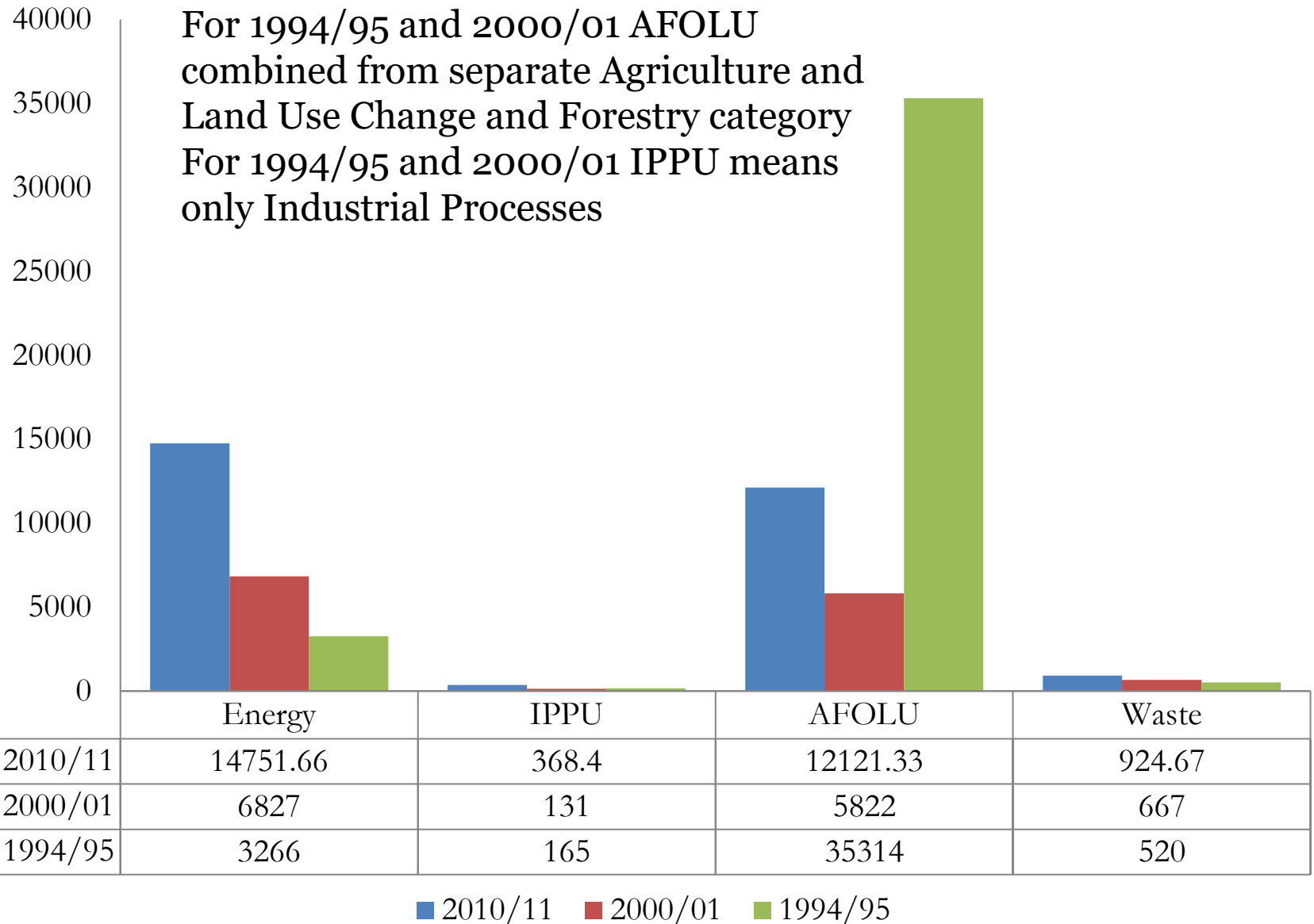
Initial, July 2004

Greenhouse Gas Emissions in Nepal

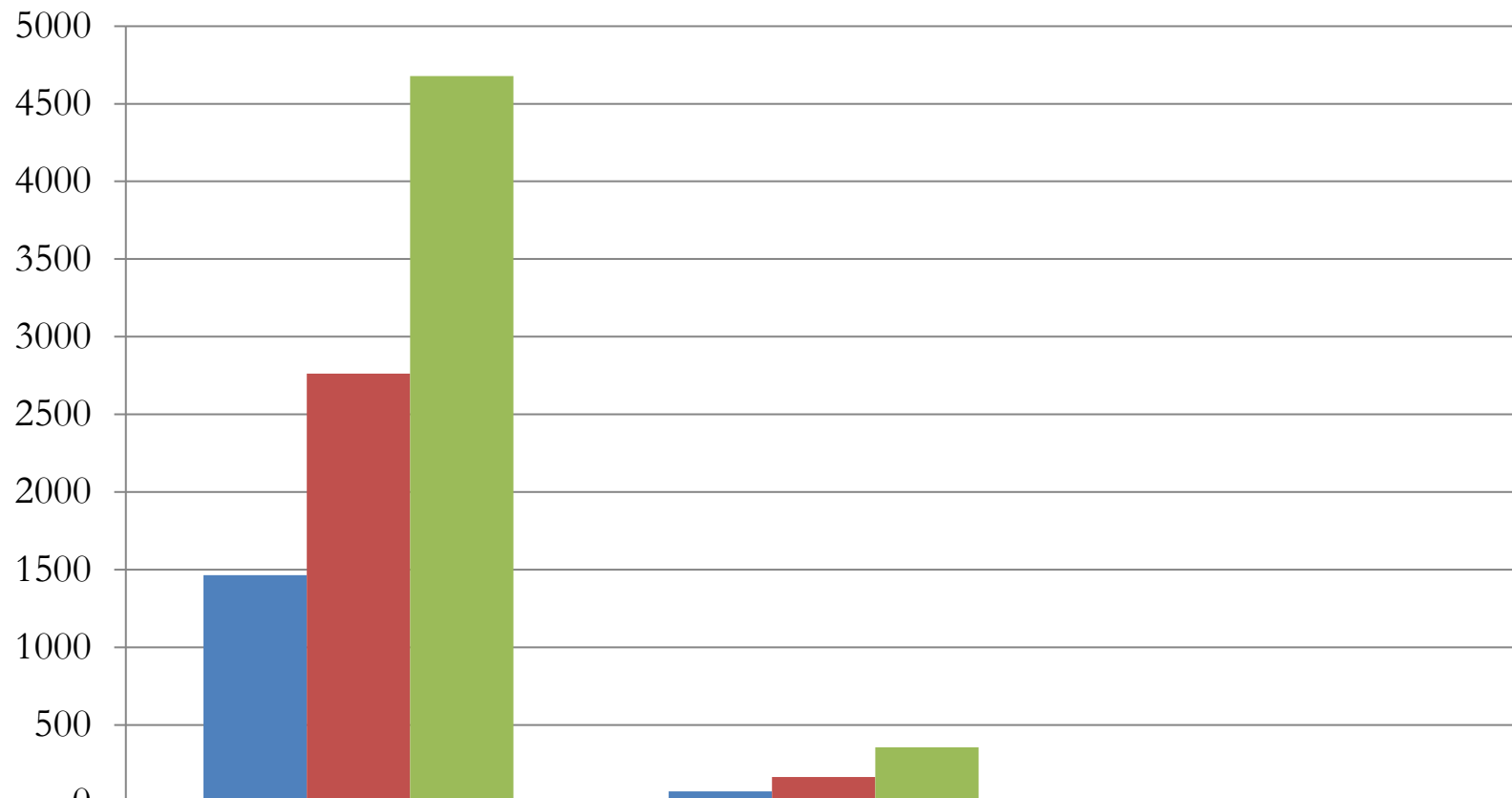
- Major consideration of seven GHGs CO₂, N₂O, CH₄, NO_x, CO, NMVC, SO₂ including HFCs, PFCs and SF₆ in TNC;
- Nepal's GHG emission contribution
 - INC: 0.025%
 - SNC: 0.027%
 - TNC: 0.06%



Emission data based on NCs

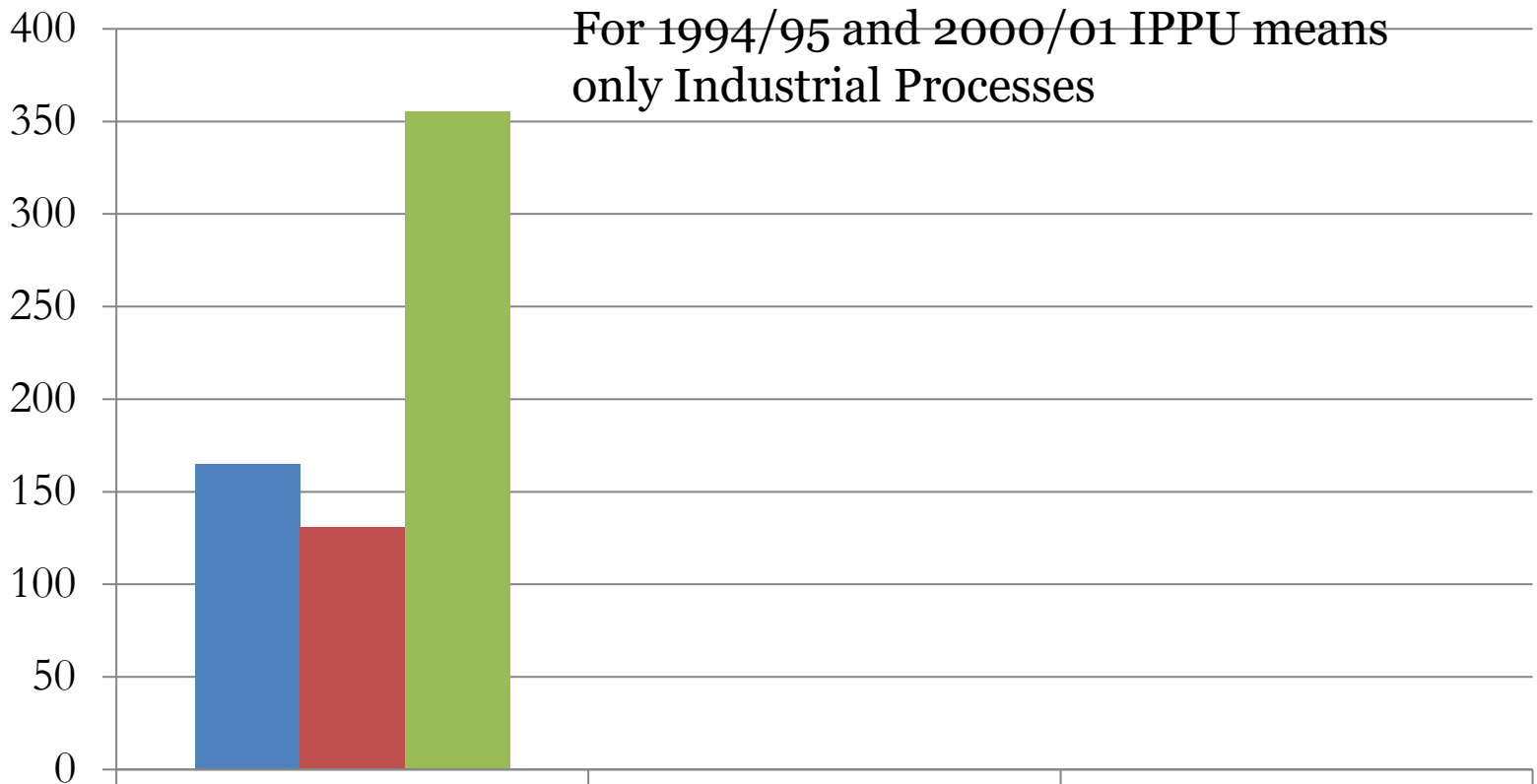


Emission from Energy Sector based on NCs



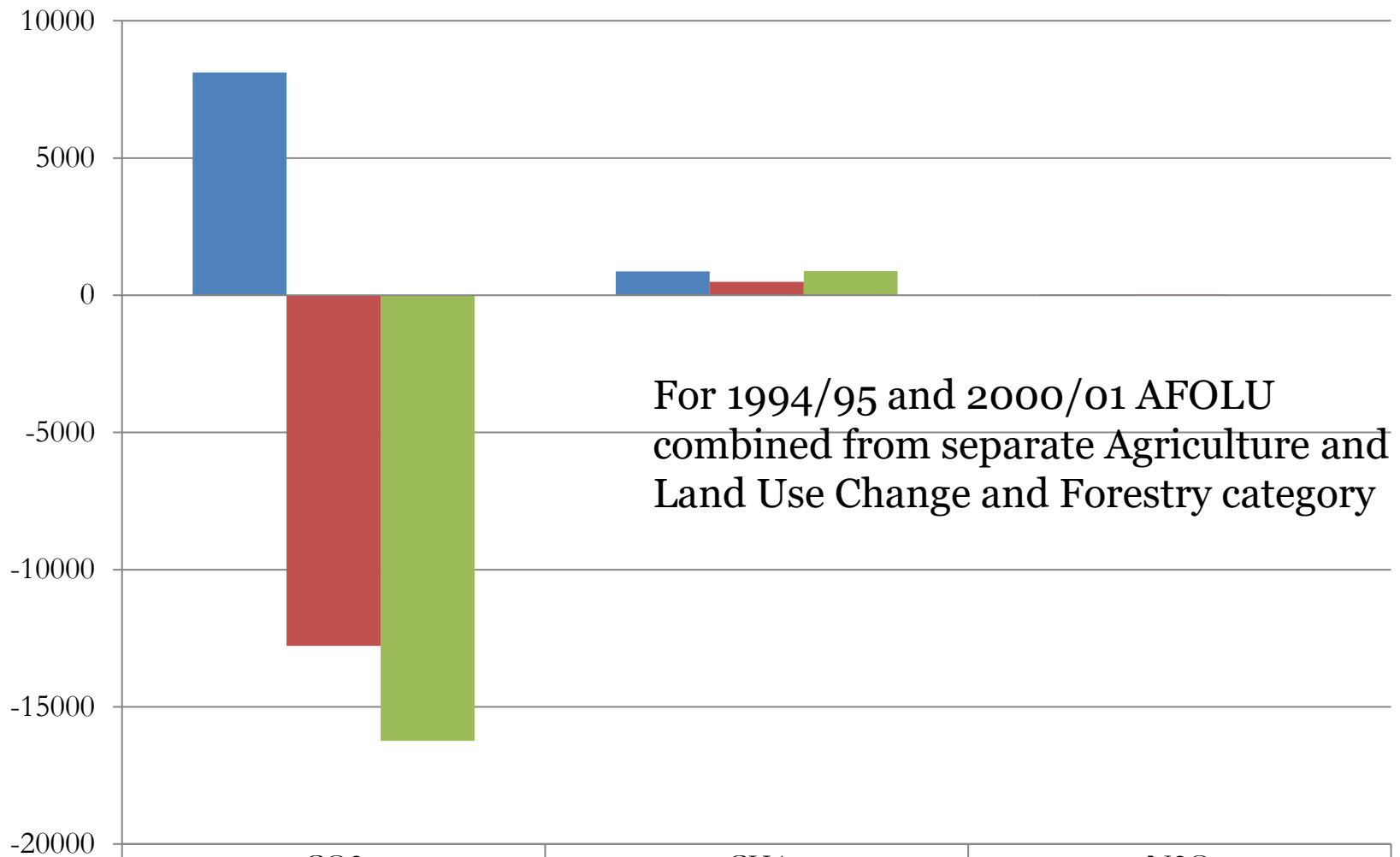
	CO2	CH4	N2O
1994/95	1465	71	1
2000/01	2763	164	2
2010/11	4678.22	354.9	4.03

Emission from IPPU Sector based on NCs



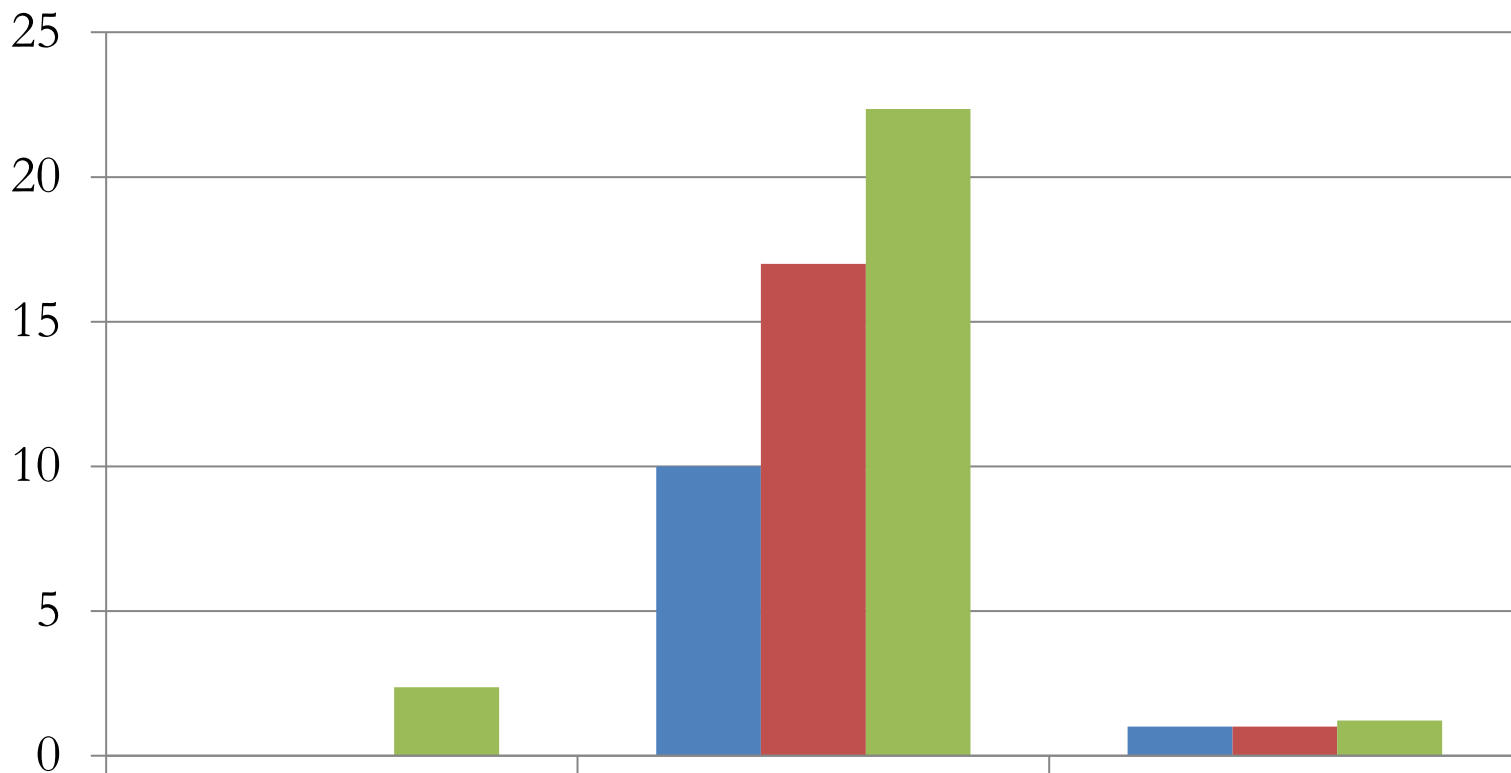
	CO2	CH4	N2O
■ 1994/95	165	0	0
■ 2000/01	131	0	0
■ 2010/11	355.4	0	0

Emission from AFOLU Sector based on NCs



	CO2	CH4	N2O
1994/95	8117	867	29
2000/01	-12775	487	27
2010/11	-16231.43	882.36	21.12

Emission from Waste Sector based on NCs



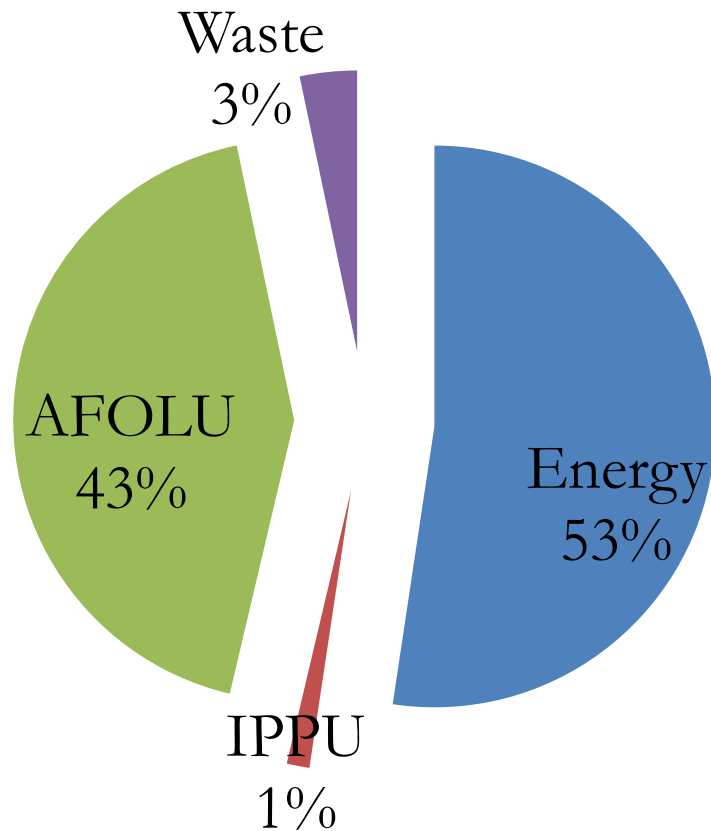
	CO2	CH4	N2O
■ 1994/95	0	10	1
■ 2000/01	0	17	1
■ 2010/11	2.36	22.35	1.22

Summary Table of Nepal's GHG emission and removal 2011

Direct Gases

Sector, Sub-sectors	Net Emission/Sink of Direct Gas (Gg)				
	CO ₂	CH ₄	N ₂ O	HFC*	CO ₂ -eq
TOTAL	-11195.02	1259.61	26.37	0.01	28166.06
1. Energy	4678.22	354.9	4.03	0	14751.66
- Energy Industries	2.38	0	0		2.38
- Manufacturing Industries and Construction	2237.34	0.04	0.06		2256.22
- Transport	1708.92	0.27	0.08		1739.51
- Others (Commercial/Institutional, Residential, Agricultural)	729.58	354.59	3.89		10753.55
2. Industrial Processes and Product Use	355.4		0	0.01	368.4
3. Agriculture, Forestry and Land Use (AFOLU)	-16231.43	882.36	21.12		12121.33
- Livestock		705.49	0.09		17664.07
- Land (Forest)	-17077.81				-17077.81
- Land (Non-Forest)	35.39				35.39
- Aggregate Sources and Non-CO ₂ Emissions Sources on Land (3C)	810.99	176.87	21.03		11499.68
4 Waste	2.36	22.35	1.22		924.67
<i>Memo Items</i>					
International Bunker	173.98				
Biomass Combustion for Energy Production	23,499				

Emission from major sources Based of TNC



Indirect Gases

Sector, Sub-sectors	Emission of indirect Gases (Gg)			
	NO _x	NM _{VOC}	CO	SO ₂
TOTAL	2.87	6.00	186.44	0.20
1. Industrial Processes and Product Use	0.00	6.00	0.00	0.20
2 AFOLU	2.87		186.44	
Aggregate Sources and Non-CO ₂ Emissions Sources on Land (3C)	2.87		186.44	

Summary of emission and removal computation

Computed CO ₂ -eq (Gg)	1994/95	2000/01	2010/11
Emission	54,043	26,222	54028.73
Removal	14,778	12,775	25862.67
Net	39,265	13,447	28166.06

**GHG Inventory Arrangement
REFLECTION FROM TNC**

NCs in Brief

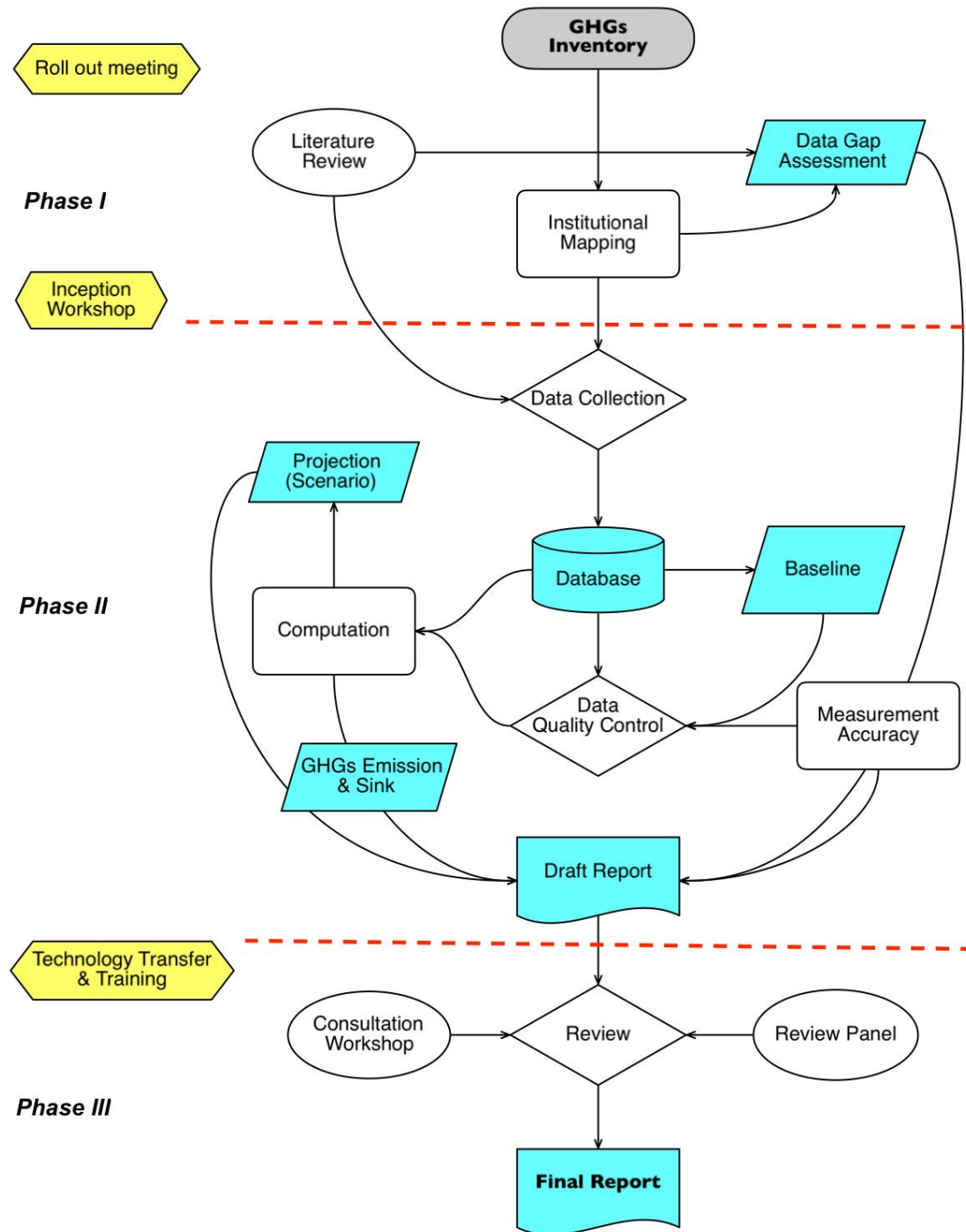
	INC	SNC	TNC
<i>Submission</i>	Jul-04	Dec-14	Jun-21
<i>Base year</i>	1994/95	2000/01	2010/11
<i>Sectors</i>	<ul style="list-style-type: none"> • Energy 	<ul style="list-style-type: none"> • Energy 	<ul style="list-style-type: none"> • Energy
	<ul style="list-style-type: none"> • Industrial processes 	<ul style="list-style-type: none"> • Industrial processes 	<ul style="list-style-type: none"> • Industrial processes and Product Use
	<ul style="list-style-type: none"> • Forestry and land-use 	<ul style="list-style-type: none"> • Agriculture 	<ul style="list-style-type: none"> • Agriculture, Forestry and Other Land Use
	<ul style="list-style-type: none"> • Agriculture 	<ul style="list-style-type: none"> • Land use, Land use change and forestry 	<ul style="list-style-type: none"> • Waste
	<ul style="list-style-type: none"> • Waste 	<ul style="list-style-type: none"> • Waste 	<ul style="list-style-type: none"> • Memo items: International bunkers Biomass Combustion for Energy Production
			<ul style="list-style-type: none"> • Memo items: International bunkers Biomass
<i>Reference Guidelines</i>	Revised IPCC Guidelines for National GHG Inventories 1996	IPCC Guidelines for National GHG Inventories 1996	IPCC Guidelines for National GHG Inventories 2006
<i>GHGs Used</i>	CH ₄ , CO ₂ , NO ₂	Direct gases: CH ₄ , CO ₂ , NO ₂	Direct gases: CH ₄ , CO ₂ , NO ₂ , HFCs, PFCs, SF ₆
		Indirect gases: NO _x , CO, NMVOC, and SO ₂	Indirect gases: NO _x , CO, NMVOC, and SO ₂
<i>Future projection</i>	2000, 2010, 2020	2015, 2025, 2030	Projected up to 2030

MoFE

In Charge of TEGs

- Institutional Mapping and Literature Review
- Inception Workshop followed Data collection, Data base preparation and Computation and deliver Draft Report
- Consultation Workshop and External reviews and Final Report

Methodological framework



Institutions involved and Data Sources in Nepal's GHG inventory preparation

National Focal Agency - Ministry of Forests and Environment			
Energy	IPPU	AFOLU	Waste
CBS-Central Bureau of Statistics	CBS-Central Bureau of Statistics	CBS-Central Bureau of Statistics	ADB-Asian Development Bank
DoR-Department of Roads	DoC-Department of Customs	DFRS-Department of Forest Research and Survey	CBS-Central Bureau of Statistics
DoTM-Department of Transport Management	MoF-Ministry of Finance	DHM-Department of Hydrology and Meteorology	SWMRMC – Solid Waste Management and Resource Mobilization Centre
GIZ-German Society for International Cooperation	MoPE-Ministry of Population and Environment	DoA-Department of Agriculture	SWMTSC-Solid Waste Management Technical Support Centre
MoCTCA-Ministry of Culture, Tourism and Civil Aviation	MoSTE-Ministry of Science, Technology and Environment	DoF-Department of Forest	DoI-Department of Industry
MoE-Ministry of Energy	NEEP-Nepal Energy Efficiency Programme	ICIMOD-International Centre for Integrated Mountain Development	JICA-Japan International Cooperation Agency
MoEWRI- Ministry of Energy, Water Resources and Irrigation	TEPC-Trade and Export Promotion Centre	MoAD-Ministry of Agricultural Development	FAO-Food and Agriculture Organization
NEA-Nepal Electricity Authority	UCIL-Udayapur Cement Industries Limited	MoALD-Ministry of Agriculture and Livestock Development	WB-World Bank
NOC-Nepal Oil Corporation	USGS-United States Geological Survey	MoFSC-Ministry of Forest and Soil Conservation	
WECS-Water and energy Commission Secretariat	DoI-Department of Industry	FAOSTAT-Food and Agriculture Organization Statistics	

Identified TEG members for BUR/BTR

National Focal Agency - Ministry of Forests and Environment

- Ministry of Industry, Commerce and Supplies
- Ministry of Energy, Water Resources and Irrigation
- Ministry of Agriculture and Livestock Development
- Ministry of Physical Infrastructure and Transport
- Ministry of Federal Affairs and General Administration
- National Planning Commission
- Water and Energy Commission Secretariat
- Central Bureau of Statistics
- Forest Research and Training Centre
- REDD- Implementation Centre
- Nepal Academy of Science and Technology
- Nepal Agricultural Research Council
- Alternative Energy Promotion Centre
- Central Department of Environmental Science, Tribhuvan University
- Institute of Engineering, Pulchowk Campus, Tribhuvan University
- Department of Environmental Science And Engineering, Kathmandu University

In TNC

- (i) Compile GHG emissions 2011-2014 for the estimation of CO₂, N₂O, CH₄, NO_x, CO, NMVC, SO₂ as well as for HFCs, PFCs and SF₆; using 2011 as the base year;
- (ii) Conduct quality control and quality assurance of inventory data based on IPCC Good Practice Guidance and Uncertainty Management in National GHG Inventory, including key category analysis;
- (iii) Analyze data using sectoral and reference approaches based on 2006 IPCC Guidelines on national inventories;
- (iv) Establish and maintain a database for CO₂, N₂O, CH₄ and other greenhouse gases as appropriate; and
- (v) Project GHG emission trends up to 2030.

Methods of GHGs inventory (IPCC Process)

- *2006 IPCC Guidelines* - provide methodologies for estimating national inventories of anthropogenic emissions by sources and removals by sinks of greenhouse gases;
- Provide guidance on ensuring quality on all steps of the inventory compilation – from data collection to reporting;
- **Transparency, Completeness, Consistency, Comparability, Accuracy**

$$Emission = \sum_{i=1}^n (EF * Ac)_i$$

Where, EF = emission factor,

Ac = activity,

i = various type of activities ($1, 2, 3 \dots n$).

- 2006 IPCC Guidelines for National Greenhouse Gas Inventories (IPCC, 2006);
- IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories (IPCC, 2000);
- IPCC Good Practice Guidance for Land Use, Land-Use Change, and Forestry (IPCC, 2003);

Progress, Achievements and National Commitments

Visible Progress

- Forest cover 45%
- Submission of three NCs
- Development of Policy and Strategy

Policies and Regulations

- National Climate Change Policy
- National Adaptation Plan 2021-2050
- Drafted Low Carbon Economic Development Strategy
- Nepal's Long-term Strategy for Net-zero Emissions
- Energy Efficiency Standards and Labeling Programme
- National Energy Efficiency Strategy, 2075
- Renewable Energy Subsidy Policy
- Biomass Energy Strategy
- National Action Plan for Electric Mobility
- Solid Waste Management Act (SWMA) 2011
- Land use policy, 2015
- Environment Protection Act
- Environment Friendly Vehicle and Transport Policy (2013)
- Clean Development Mechanism

- **NDC**

The 2020 NDC for the first time sets a vision to achieve net zero greenhouse emission by 2050

- ✓ **Energy:** By 2030, increase clean energy generation to 15,000 MW

Transportation: Targets to increase sales of e-vehicles to cover 25% of all private passenger vehicle sales (including two-wheelers) and 20% of all four-wheeler public passenger vehicle sales (excludes e-rickshaws and e-tempos) by 2025, Increase e-vehicle sales to 90 percent of all private passenger vehicle sales (including two-wheelers) and 60 percent of all four-wheeler public passenger vehicle sales by 2030. These targets are estimated to reduce emissions from a projected business as usual of 3,640 Gg CO₂ eq. in 2030 to 2,619 Gg CO₂ eq., which is around 28% decrease in emissions

Clean Cooking: Goal is to install 500,000 improved cooking stoves, primarily in rural areas, and an additional 200,000 household biogas plants and 500 large scale biogas plants (institutional/industrial/municipal/community) by 2025.

- ✓ **AFOLU:** By 2030, 45 per cent of the total area of the country will be under forest cover

- ✓ **Waste:** By 2025, 380 million liters of wastewater will be treated per day and 60,000 cubic meters of fecal sludge will be managed.

- **LTS** - Nepal's goal is to achieve net zero emissions from 2020-2030 and after a period of very low emissions to full net zero by 2045.
- **NAP**-The plan sets out short-term priority actions to 2025, as well as medium-term priority programs to 2030 and long-term adaptation strategic goals to 2050 that aim to assist Nepal to better integrate actions and strategies to address climate risk and vulnerability in development planning and implementation.

- **Climate Change Policy 2019** is to promote a green economy by adopting the concept of low carbon emission development
- **Nepal formulated the Environment Friendly Vehicle and Transport Policy (2013)**, which is the guiding policy document for promoting electric mobility. It includes targets to increase the electric vehicles share to 20% by 2020 (which wasn't achieved; less than 1% vehicles are electric)

Priority in Government programs and budgets

- **Federal fiscal budget 2021/22** has adopted the policy to phase-out light duty fossil fuel vehicles and switch to electric ones by 2031
- **Federal Fiscal budget 2022/23**, targeted to promote the use of electric vehicles, by installing charging stations at 50 locations throughout the country. Provisioned a rebate of up to 15% on their electricity bill for industries consuming electricity worth more than 100 million (USD 819,672).
- **Federal fiscal budget 2023/24** has targeted to provide **electricity access to cent percent populations** in the next two years. Announced to lunch **Special Climate Projects** in 43 local governments

Challenges and Limitations

- Gaps in Data availability and quality
- Many sources and less Data and limited reliability
- Limited Institutional Capacity and Less Priority on Knowledge Transfer
- Lack of technical expertise and resources – in data management, computation, inadequate understanding on international reporting, procedure and guidelines;
- MRV not developed
- Insufficient Stakeholder Engagement and Coordination

The Way Forward

- Development and Institutionalization of MRV
- Should maintain and increase international cooperation and partnerships
- Policy implementation and action oriented programs
- Strengthen institutional arrangements and capacity building
- Enhance the transparency and accuracy of data
- Research and development of national emission factors and activity data to advance on higher IPCC Tier

Thank you