Singapore’s effort in preparing the First Biennial Transparency Report

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National Environment Agency

National Environment Agency

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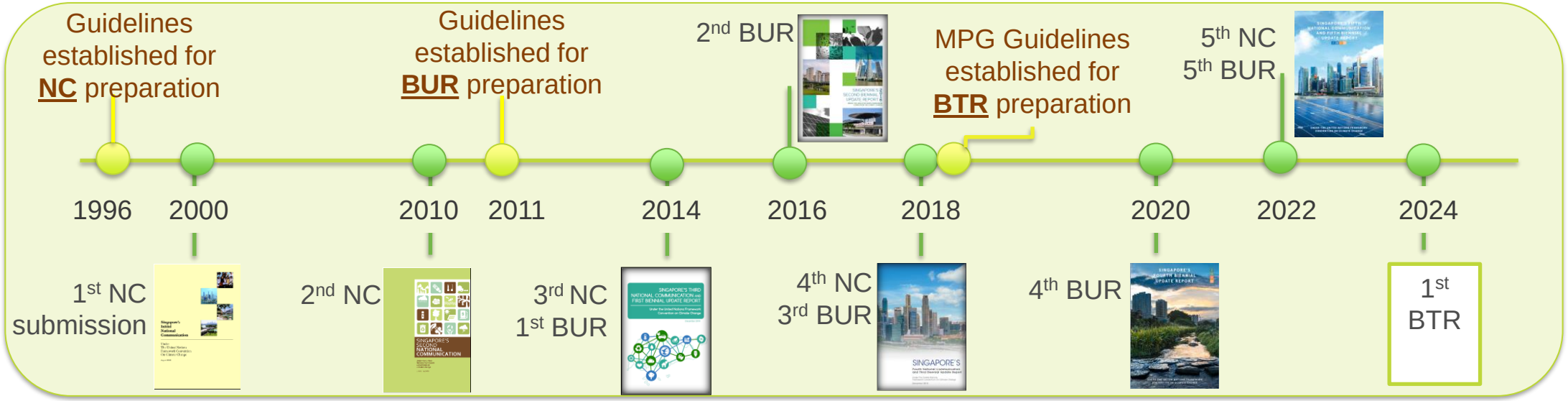
Agenda

1. Background
2. Institutional Arrangements
3. Difficulties, gaps, progress and results

1 Background

Reporting of Greenhouse Gas (GHG) Emissions

1. National Communications (NC) and Biennial Update Report (BUR)
   - As a Party to the United Nations Framework Convention on Climate Change (UNFCCC)[1], Singapore is committed to submitting NC and BUR to the UNFCCC
     - NC once every 4 years since 2000, 5th NC submitted in 2022
     - BUR once every 2 years since 2014, 5th BUR submitted in 2022



2. Under the Paris Agreement, the Biennial Transparency Report (BTR) will supersede the reporting of BUR under the Convention
   - BTR once every 2 years, with the 1st submission due by 31 Dec 2024

[1]UNFCCC is the United Nations body that supports global response to climate change and it is a parent treaty to the 2015 Paris Agreement.

Stakeholders/Agencies involved in BTR preparation

National Environment Agency
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Department of Statistics Singapore
Empowering You with Trusted Data

Singapore Food Agency

Energy Market Authority
Our Clean Energy Future

National Parks

MPA Singapore

Land Transport Authority
We Keep Your World Moving

PUB Singapore's National Water Agency

~ 20 data owners across agencies

Energy CRT

GREENHOUSE GAS SOURCE AND SINK CATEGORIES
1.A. Fuel combustion
1.A.1. Energy industries
1.A.1.a. Public electricity and heat production [9]
1.A.1.a.i. Electricity generation
1.A.1.a.ii. Combined heat and power generation
1.A.1.a.iii. Heat plants
1.A.1.b. Petroleum refining
1.A.1.c. Manufacture of solid fuels and other energy industries [10]
1.A.1.c.i. Manufacture of solid fuels
1.A.1.c.ii. Oil and gas extraction
1.A.1.c.iii. Other energy industries

Waste CRT

GREENHOUSE GAS SOURCE AND SINK CATEGORIES
5.A.1. Managed waste disposal sites
5.A.1.a. Anaerobic
5.A.1.b. Semi-aerobic
5.A.1.c. Active-aeration
5.A.2. Unmanaged waste disposal sites
5.A.3. Uncategorized waste disposal sites

IPPU CRT

GREENHOUSE GAS SOURCE AND SINK CATEGORIES
2.F. Product uses as substitutes for ODS
2.F.1. Refrigeration and air-conditioning
2.F.1.a. Commercial refrigeration
2.F.1.b. Domestic refrigeration
2.F.1.c. Industrial refrigeration
2.F.1.d. Transport refrigeration
2.F.1.e. Mobile air-conditioning
2.F.1.f. Stationary air-conditioning
2.F.2. Foam blowing agents
2.F.2.a. Closed cells
2.F.2.b. Open cells
2.F.3. Fire protection
2.F.4. Aerosols
2.F.4.a. Metered dose inhalers
2.F.4.b. Other *(please specify - one row per substance)*
2.F.5. Solvents

AFOLU CRT

GREENHOUSE GAS SOURCE AND SINK CATEGORIES
3.G. Liming [1]
3.G.1. Limestone $CaCO_3$
3.G.2. Dolomite $CaMg(CO_3)_2$
3.H. Urea application
3.I. Other carbon-containing fertilizers
3.J. Other *(please specify)* [2]

LULUCF CRT

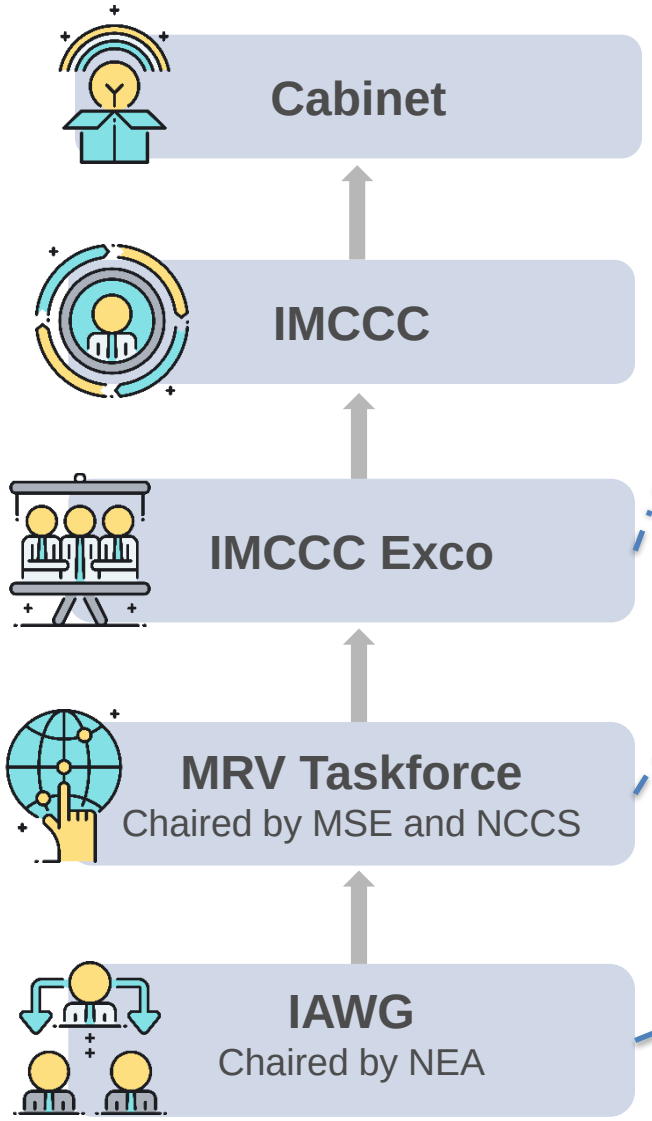
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	
Land-use category	**Subdivision** [2]
4.A. Total forest land	
4.A.1. Forest land remaining forest land	
4.A.2. Land converted to forest land [10]	
4.A.2.a. Cropland converted to forest land	
4.A.2.b. Grassland converted to forest land	
4.A.2.c. Wetlands converted to forest land	
4.A.2.d. Settlements converted to forest land	
4.A.2.e. Other land converted to forest land	

Greater detail in reporting required

Submission Timeline → Dec 2024

2 Institutional Arrangements

Inter-agency Coordination on BTR Preparation



Inter-Ministerial Committee on Climate Change (IMCCC) oversees Whole-Of-Government (WOG) coordination on Singapore's approach to climate change.

1) Monitoring, Reporting and Verification (MRV) Taskforce endorses content for Singapore's BTR, including GHG inventory – and seeks approvals from IMCCC Exco, IMCCC and Cabinet.
2) Co-chaired by National Climate Change Secretariat (NCCS) and Ministry of Sustainability and the Environment (MSE)

Inter-agency working group (IAWG) consist of members from various government agencies produces Singapore's BTR led by National Environment Agency (NEA)

3 BTR Preparation:
Difficulties, gaps, progress and results

Preparation of Greenhouse Gas (GHG) Inventory for BTR since WGIA20

Task	Entity	Done	2023						2024											
			Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Sectoral Inventory Compilation Stage																				
Identify methodological issues (including tier selection)	government agencies involved in the GHG work	✓																		
Consider methodological revision	government agencies involved in the GHG work	✓																		
Collect activity data	government agencies involved in the GHG work	⚙																		
Collect emission factors	government agencies involved in the GHG work	✓																		
Calculate sectoral emissions & removals	GHG compiler	⚙																		
Aggregate sectoral emissions to get national total	GHG compiler	⚙																		
Draft NID	GHG compiler	⚙																		
Input data to CRT	NEA, NParks, SFA																			
Cross-cutting Inventory Compilation Stage																				
Key category analysis	GHG compiler	⚙																		
Uncertainty analysis	government agencies involved in the GHG work	⚙																		
QA/QC and Final Approval Stage																				
QA/QC	government agencies involved in the GHG work, GHG compiler	⚙																		
Official consideration process	GHG compiler, MSE, NCCS																			
Submit inventory to UN	NCCS (national focal point)																			

✓ Completed

⚙ In progress

Timeline extension

Sharing about Singapore's ongoing BTR preparation – Challenges

	Challenges faced	Progress towards BTR submission
Time series	1. Lack of historical data to meet the full time-series data requirements and data gaps during years without emissions reporting 2. Greater granularity required in BTR as compared to BUR	1. Working with data owners to review past data and backward projection to plug historical data gaps using splicing techniques based on IPCC Guidelines 2. Reviewing emission sources to disaggregate into greater granularity and subcategories

Sharing about Singapore's ongoing BTR preparation – Challenges

	Challenges faced	Progress towards BTR submission
Data	1. Data masking required to protect stakeholders' data confidentiality 2. Determining the level of masking to sufficiently prevent back calculation 3. Managing the numerous streams of data and masking subcategories	1. Liaising with data owners on the appropriate category to mask the data 2. Establishing internal criteria to mask specific data streams 3. Continually performing checks with clear documentation of the masking subcategory, constantly checking formulation to ensure accuracy

Sharing about Singapore's ongoing BTR preparation – Challenges

	Challenges faced	Progress towards BTR submission
Uncertainty Assessment	1. Used to provide only qualitative assessment but to work towards reporting quantitative estimation in BTR 2. Lack of country-specific uncertainty factors	1. Capacity building through UNFCCC's Uncertainty Webinar 2. Using higher tier uncertainty factors where available unless otherwise stated (i.e. default IPCC uncertainty factors applied instead).

Inventory sector	IPCC category code	IPCC category name	Gas	Activity data uncertainty	AD uncertainties correlated across years?	Emission factor /estimation parameter uncertainty	EF uncertainties correlated across years?	Combined uncertainty
				%		%		%
Energy	1.A.1.a.i.	Electricity generation, Liquid fuels	CO2	2.0	N	2.0	N	3
Energy	1.A.1.a.i.	Electricity generation, Liquid fuels	CH4	2.0	N	150.0	Y	150
Energy	1.A.1.a.i.	Electricity generation, Liquid fuels	N2O	2.0	N	200.0	Y	200
IPPU	2.B.10.b.	Other	CO2	5.0	N	3.0	Y	6
IPPU	2.B.10.b.	Other	CH4	5.0	N	14.0	Y	15
IPPU	2.B.10.b.	Other	N2O	9.0	N	46.0	Y	47

Sharing about Singapore's ongoing BTR preparation – Continual Improvement

	Challenges faced	Progress towards BTR submission
Continual Improvement	• Uncovering new emission sources that have yet to be reported in our national GHG inventory	• Developing National Inventory Improvement Plan (NIIP) to continually improve calculation and reporting methodology

Area of improvement	**Priority level**			**Total**
	High	**Medium**	**Low**	
Institutional arrangement	6	1	2	9
Cross-cutting	27	7	5	39
Energy	20	20	23	63
IPPU	13	4	11	28
Agriculture	39	0	8	47
LULUCF	137	0	5	142
Waste	15	5	3	23

Sharing about Singapore's ongoing BTR preparation – New stakeholders and Tools

1. Engaging New Stakeholders

To improve on the completeness of the BTR submission, new stakeholders and agencies were contacted where data gaps were identified.

Contact potential new stakeholder
- Explain BTR reporting requirements
- Determine the availability of data and calculation methodology
- Check for possible double-counting

→

Obtain new stream of AD and emissions data
- Ensure AR5 GWP is adhered in calculations
- Doublecheck calculation methodology
- Adequately mask data if necessary or requested

→

Engage stakeholder to perform QAQC checks on new data
- Develop QAQC checklist/methodology
- Ensure that there is no sensitivity issues due to QAQC procedures
- Thoroughly explain the process and importance of QAQC in the BTR preparation

2. UNFCCC Reporting Tool

- Lack of familiarity with the interface
- Tight timeline as the populating of data can only begin after the tool is made available
- Using a mockup of the reporting tool in the meantime

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