

# National GHG inventory as part of the Enhanced Transparency Framework (ETF) and its linkage to the Global Stocktake (GST)

IGES Climate and Energy Area

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Round table for “From satellite observation to national GHG inventories: inputs to the Global Stocktake of the Paris Agreement”

# Round table for “From satellite observation to national GHG inventories: inputs to the Global Stocktake of the Paris Agreement”

## *Objectives*

- Enhance understanding of the Global Stocktake (GST), the Enhanced Transparency Framework (ETF) and their linkage
- Exchange experiences on how Greenhouse gases Observing SATellite (GOSAT) data contributed to preparation for Mongolia’s GHG inventory
- Exchange views on how countries could utilise GOSAT satellite data to contribute to the process of developing GHG inventories

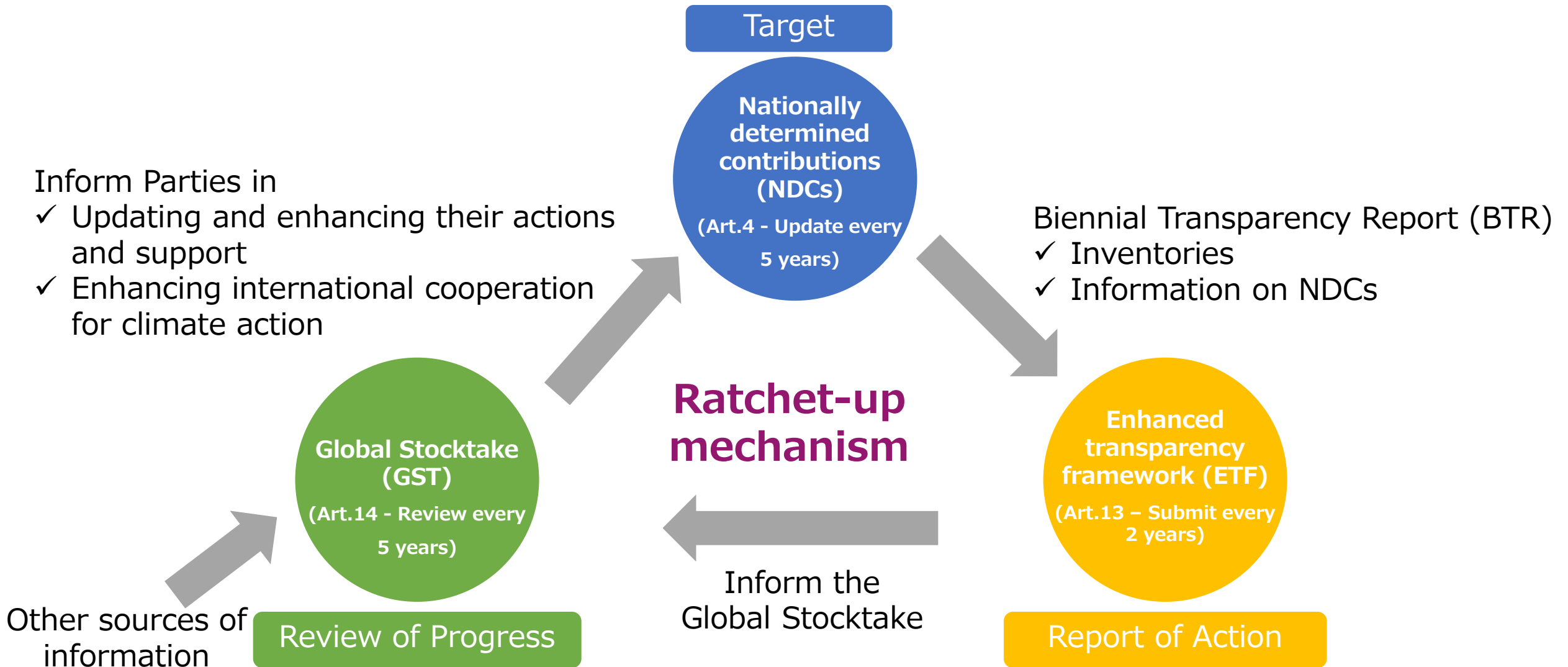
## *Expected Outcomes*

- Participants have a better understanding of the linkage between GST and ETF
- Potential ideas and approaches to use GOSAT satellite data for GHG inventories
- Build a collaborative partnership for the next fiscal year

# Outline

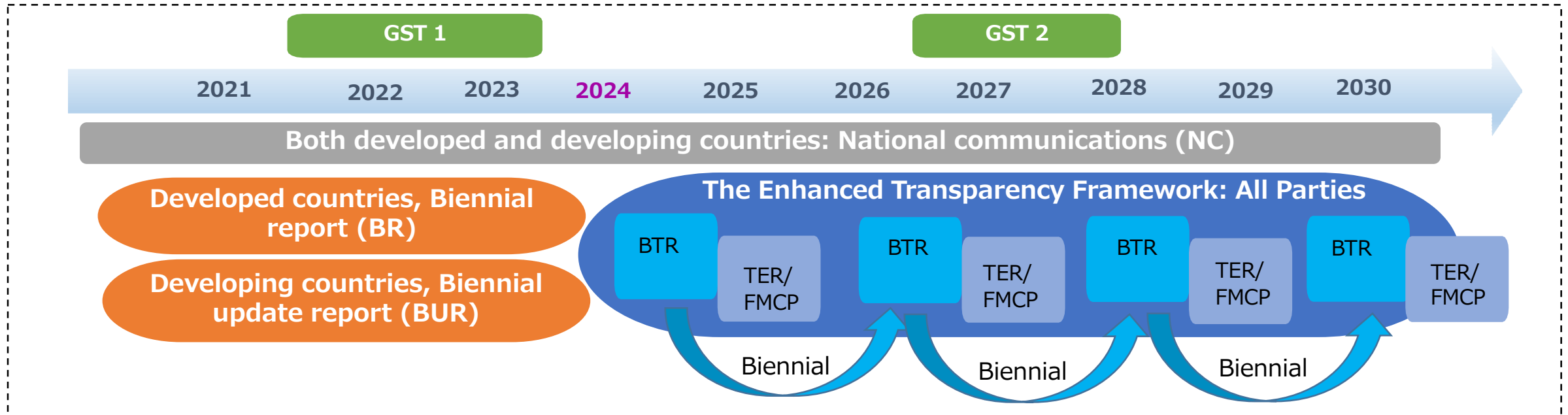
- 1 Paris Agreement: Ratchet-up mechanism
- 2 Enhanced Transparency Framework (ETF): National Greenhouse Gas (GHG) Inventory
- 3 Opportunities of GOSAT in the improved quality of GHG inventory
- 4 Linking GHG inventories and the Global Stocktake (GST)

# Paris Agreement's "Ratchet-up mechanism"



# Article 13 of the PA: The Enhanced Transparency Framework

- Under the framework, all Parties are required **to biennially report information** necessary to track progress made in implementing and achieving their NDCs, **“Biennial transparency report” (BTR)**
- More specific **common guidelines on how to conduct reporting** are finally adopted in Glasgow COP26, “Modalities, procedures and guidelines for the transparency framework for action and support referred to in Article 13 of the PA” **(MPGs)\***
- Information provided in BTR is subject to **a technical expert review (TER)** and also subject to the facilitative multilateral consideration of progress (FMCP).



\*Modalities, procedures and guidelines for the transparency framework for action and support referred to in Article 13 of the PA (MPGs) [https://unfccc.int/sites/default/files/resource/l23\\_0.pdf](https://unfccc.int/sites/default/files/resource/l23_0.pdf)

# National GHG inventory in BTR

Information related to action and support that is reported in BTR:

- Action** 1. National GHG inventory report (Mandatory)
- Action** 2. Information necessary to track progress of NDCs under Article 4 (Mandatory)
- Action** 3. Information related to climate change impacts and adaptation (Not mandatory)
- Support** 4. Information support provided and mobilised (Mandatory, developed countries)
- Support** 5. Information support needed and received (Not mandatory, developing countries)

## 1. National GHG inventory report (Mandatory)

Flexibility provided	Flexibility not provided
<ul style="list-style-type: none"><li>• Gas</li><li>• Key category analysis</li><li>• Time series</li><li>• Uncertainty assessment</li><li>• Completeness</li><li>• Quality Assurance /Quality Control</li></ul>	<ul style="list-style-type: none"><li>• Reporting form</li><li>• National inventory arrangements</li><li>• IPCC guidelines (2006)</li><li>• Sector</li><li>• Recalculations</li></ul>



Each Party should, to the extent possible, identify, regularly update and include information on areas of improvement

# Quality Assurance, Quality Control and Verification

**Quality control (QC):** System of routine technical activities **to assess** and **maintain the quality of the inventory as it is being compiled.** Performed by personnel compiling the inventory

**Quality assurance (QA):** Planned system of **review procedures conducted by a person not directly involved in the inventory** compilation/development process. Preferably conducted by independent third parties.

**Verification:** Activities using **external data that help to establish the reliability of the inventory** including comparisons with emission or removal estimates prepared by other bodies and comparisons with estimates derived from fully independent assessments (e.g. atmospheric concentration measurements)

- Correspondence between the national inventory and independent estimates increases the confidence and reliability of the inventory estimates by confirming the results.

**It is a “good practice” to conduct verification process, so that the quality of inventories can be improved over time.**

# Opportunities of GOSAT in National GHG Inventories

*IPCC 2019 refinement to the 2006 IPCC Guidelines for National GHGI* mentions **the possibilities of utilising satellite observations and their data for verification of National GHG Inventories.**

## Activities/Studies using satellite observation

- Using regional and global inverse model products for comparison to national inventories
  - Satellite observations are utilised for reducing uncertainties to apply larger scale modelling for a national level
    - Greenhouse gases Observing SATellite (GOSAT) was used for national scale methane emission estimates with regional inverse models for India (Ganesan et al. 2017) and the US (Turner et al. 2015)
- Studies on the sensitivity of satellite sensors to concentration enhancements around emission hot spots
  - Local GHG concentration enhancements observed by the GOSAT satellite correlate well with transport model simulations (Janardanan et al. 2016; Janardanan et al. 2017)
- **Mongolia's GHG inventory verification using GOSAT data**

**GOSAT data has potential to be a tool for inventory verification**



# Current status on national GHG inventory preparation

- All countries have **higher capacity for preparing the GHG inventory**, Kazakhstan: NC7-BR3 (2017), BR4 (2019), Kyrgyzstan: NC3 (2016), Tajikistan: BUR1 (2018), Turkmenistan: NC3 (2015), Uzbekistan: BUR1 (2021)
- **IPCC Guidelines for National GHG Inventory 2006** and IPCC Good Practice Guidance and Uncertainty Management 2000 are used in the majority of countries
- **National legal framework** to prepare NC, BR/BUR including GHG inventory has been developed
- **Designated ministry to lead inventory preparation** (UNFCCC national focal point) and **structured institutional arrangements for relevant line ministries** have been established
- **QC/QA procedure is conducted at all stages in most countries** such as verifying the completeness, and reliability of data, checking the appropriate application of methodologies, and reviewing calculated outcomes
- However, there are **gaps and constraints in data availability to ensure sustainable QC/QA/verification process** in GHG inventory preparation (e.g. use of satellite data to reduce uncertainties in data)

**There is room to improve the quality of national inventories, and over time they would meet reporting requirements in BTRs**

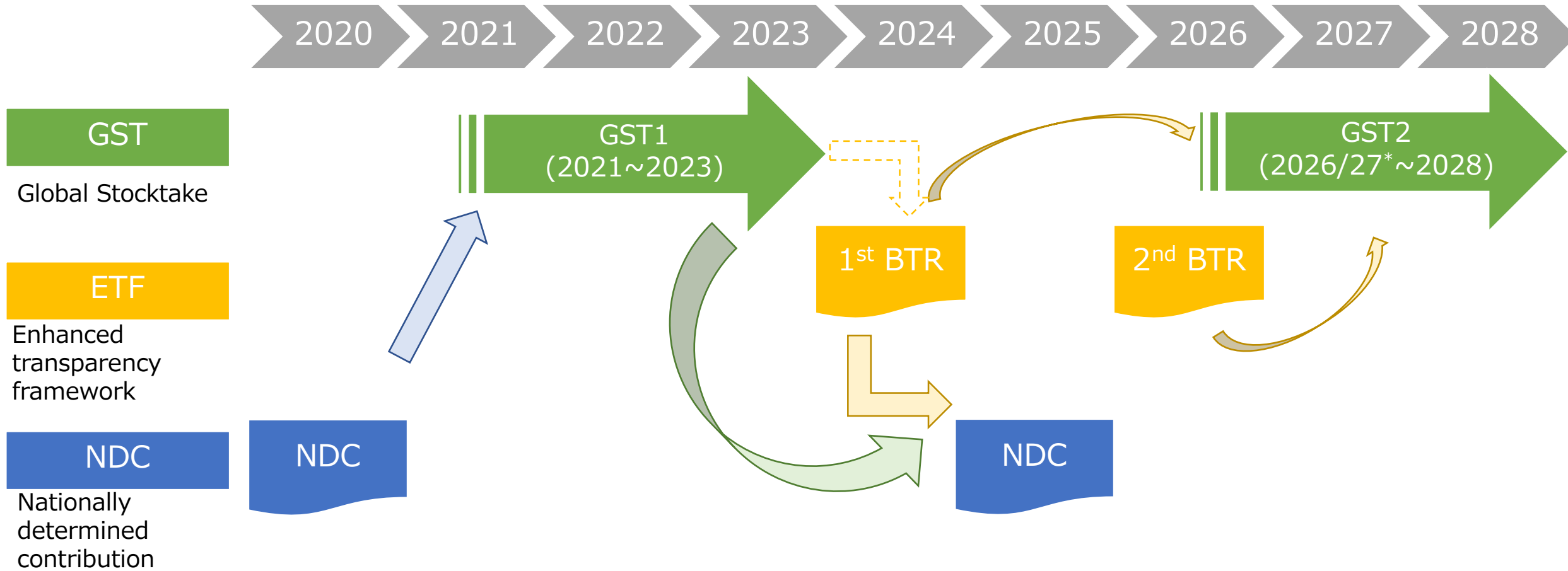
# How does the GST refer to National GHG inventories?

The global stocktake (GST) is **a process for taking stock of the implementation of the Paris Agreement** with the aim to assess **the world's collective progress** towards achieving the purpose of the agreement and its long-term goals.

- A National GHG inventory is **one of sources of inputs to the GST**, which helps us understand the effectiveness of undertaken climate actions by identifying emission sources and sinks, and tracking changes over time.
- Information on inventories, submitted by each Party, **will be aggregated** in assessing the progress, which will be fundamental data to inform global climate actions
  - Biennial update reports (BUR), Biennial report (BR) and National Communications (NC) for GST1
  - Biennial transparency report (BTR) for GST2

**Developing a national GHG inventory and continuously improving its quality is one of many ways to engage with the Paris Agreement**

# Future prospect for GST2



**There are two chances to submit BTRs before GST2**

\* GST2 will commence in 2026 when new IPCC reports are available, otherwise in 2027

# Summary

- Ratchet-up mechanism of the Paris Agreement: NDCs, the ETF and the GST.
- Under the ETF, developing a national GHG Inventory report is mandatory.
- Conducting verification is a good practice to enhance the quality of inventories – GOSAT has the potential to contribute to this process.
- Countries have the capacity to prepare inventories - there is room to improve the quality of national inventories, and over time they would meet reporting requirements in BTRs.
- National GHG inventory report is one of the inputs to the GST – developing a national GHG inventory and continuously improving its quality is one of many ways to engage with the Paris Agreement.
- There are two chances to submit BTR before GST2.

# Reference list

Tamura et al., 2016, Empowering the Ratchet-up Mechanism under the Paris Agreement: Roles of Linkage between Five-year Cycle of NDCs and Long-term Strategies, Transparency Framework and Global Stocktake, <https://www.iges.or.jp/en/pub/wp1605/en>

2006 IPCC Guidelines for National Greenhouse Gas Inventories Chapter 6: QA/QC and Verification, [https://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/1\\_Volume1/V1\\_6\\_Ch6\\_QA\\_QC.pdf](https://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/1_Volume1/V1_6_Ch6_QA_QC.pdf)

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Turkmenistan, NC3, 2015, <https://unfccc.int/sites/default/files/resource/Tkmnc3.pdf>

Uzbekistan, BUR1, 2021, <https://unfccc.int/sites/default/files/resource/FBURUZeng.pdf>

Thank you for your attention

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# Annex

# Current status on national GHG inventory preparation (1)

Country name	Legal framework	Institutional arrangements
Kazakhstan (NC7-BR3, 2017)	Environmental Code of the Republic of Kazakhstan, Regulations on the State System of Data Collection Inventory, Rules for monitoring the completeness, transparency and reliability of GHG emissions and removals	The Ministry of Energy of the Republic of Kazakhstan is responsible for national GHG inventory
Kyrgyzstan (NC3, 2016)	Government resolution on Implementing Measures of the UNFCCC, The Law on The State Regulation and Policy on GHG Emissions and Removals	The Coordination Commission on Climate Change is the chief governing body in charge to fulfil all national commitments including GHG inventory
Tajikistan (BUR1, 2018)	All key government agencies and program implementing agencies, including those in the field of environment shall report to the Executive Office of the President of the Republic of Tajikistan	Agency for Hydrometeorology of the Committee for environmental protection is responsible for preparation of the NC, BURs including GHG inventory. The UNFCCC national focal point
Turkmenistan (NC3, 2015)	Regulations on the State Commission to ensure implementation of obligations in Turkmenistan under Conventions and UNEP programmers, Resolution on the establishment of the State Commission for CDM, Decision on approval of the National Strategy of Turkmenistan on Climate Change	The Ministry of Nature Protection of is responsible of ensuring commitments from Conventions and to prepare National Communications. Under the Ministry, the national group on GHG inventory is positioned
Uzbekistan (BUR1, 2021)	President Resolution "On measures to further improve the activities of the Centre for the Hydro-meteorological Service", President Resolution "On measures to further improve and develop the national system of statistics"	The Center for the Hydro-meteorological is appointed as the responsible organisation for preparation of NC, GHG inventory reports, and biennial updated report



## Current status on national GHG inventory preparation (2)

Country name	QC/QA procedure	IPCC guideline
Kazakhstan (NC7-BR3, 2017)	Conducted the control procedure at each stage of the inventory including planning the calculation procedure, identifying information needs, analysing the data, assessing the intermediate and final results.	IPCC, 2006; The Good Practice Guidance for LULUCF 2003.
Kyrgyzstan (NC3, 2016)	QC/QA is carried out in several stages: Verified the completeness, comparability and reliability of the baseline data, Checked the appropriate application of emission and sinks factors, Verified the calculation outcomes done by the experts/inventory team, the baseline data and results were discussed between the independent experts	IPCCC 1996, Good Practice Guidance and Uncertainty Management 2000, Good Practice Guidance for LULUCF 2003.
Tajikistan (BUR1, 2018)	A team worked on monitoring, quality assessment and technical processing of the findings on inventory preparation	IPCCC 1996 and 2006, Good Practice Guidance and Uncertainty Management 2000, Good Practice Guidance for LULUCF 2003.
Turkmenistan (NC3, 2015)	Two expert groups are created in carrying out QA/QC. The first group is taking over QC procedures and experts are from the ministries and departments, organisations and enterprises of oil/gas, energy, transport and agriculture. The second group is responsible for the QA and consists of representatives from the public environmental organisations. NC is circulated to the ministries and departments to verify the quality of the data and results.	IPCCC 1996 and 2006, Good Practice Guidance and Uncertainty Management 2000, Good Practice Guidance for LULUCF 2003.
Uzbekistan (BUR1, 2021)	Quality control is carried out at all stages. Created and maintains databases and archives of GHG inventory, both on paper and in electronic format. GHG emission reports are subject to quality assessment and approval by all involved ministries and agencies.	IPCC 2006