Methodology and Results for India’s GHG Emission Estimates for 2005-2013

Date : 28 September 2017
Venue : India Habitat Center, Delhi
Phase II

**Plan**
- Planning overall preparation of estimation
- Planning for individual source and sink categories

**Collect**
- Activity data (depending upon the IPCC tier approach)
- Proxy data
- Conversion factors
- Emission Factors
- Identify barriers
- Filling the data gaps

**Estimate**
- Initial set of GHG estimates
- Both on spreadsheet and reporting templates

**Analyze**
- First stage of review process
- Peer review by sectoral experts
- Peer review by in-house experts (not involved in GHG estimation process)

**Improve**
- Revision in GHG estimates based on review process
- Track-change mode to be adopted in order to signify changes
- Web-hosting for Public review
- Version Control

**Report**
- Finalization of estimation and report
- After satisfactory closure of all issues raised during peer review
GHG Matrix

Coverage & Scope
- Guidance (IPCC, GPC, etc.)
- Geospatial Coverage
- GHGs covered
- Other Gases (CO, NOₓ, SO₂, NMVOCs)
- Global Warming Potential

Methodology & Data
- Base Year and Period Covered
- Boundary
- Data Approach
- Data Source (1°, 2°, 3°)
- Transparency
- Recalculation
- Uncertainty

Estimation System
- Institutional Arrangement & Capacity
- Data Management System
- Record Keeping & Archiving
- Quality Management (AQ/QC)
- Verification
- Public Consultation & Outreach
- Lesson learned during Reporting

National/ Sub-National

Sectoral
- IPCC Sector
- GHG Coverage
- IPCC Tier
- Tier Description
- Emission Factors (Country-specific, Default)

Energy
- IPPU
- AFOLU
- Waste
## Key Information

<table>
<thead>
<tr>
<th><strong>Guidance</strong></th>
<th><strong>Choice on GWP</strong></th>
<th><strong>GHG Boundary</strong></th>
<th><strong>Data Approach</strong></th>
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<tbody>
<tr>
<td>Flexibility to choose from IPCC Good Practice Guidance and National Good Practice Guidance.</td>
<td>Reporting based on SAR values for comparability with NATCOM Reports; Reporting based on latest AR values to be in-line with IPCC good practice.</td>
<td>Clear guidance on physical perimeter of inventory boundary; Two levels of classification: 1. National; and 2. State level</td>
<td>Guidance on data approach (top-down or bottom-up); Apportionment guide (e.g. econometric, FY to CY)</td>
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<th><strong>QA/ QC</strong></th>
<th><strong>Recalculation</strong></th>
<th><strong>Uncertainty</strong></th>
<th><strong>Specific Guidance</strong></th>
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<td>Guidance on ensuring quality of GHG estimates (e.g. AD, EF, assumptions, time series consistency, calculations, completeness, etc.)</td>
<td>Clear guidance on possible reasons; Clear guidance on reporting of recalculations to ensure accuracy and completeness.</td>
<td>Identifying and Reporting on type of uncertainty; Good practice guidance on statistical methods; Combined uncertainties: IPCC Good Practice.</td>
<td>Agriculture, Forestry and Fishing; On-road and off-road transportation; Waste-to-Energy, Others.</td>
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What are we trying to accomplish?

- **Accuracy**: Quantification is neither over nor under actual emissions. Uncertainties are removed as far as practicable.
- **Transparency**: Consistent methodologies allows meaningful comparison of emissions over time.
- **Relevance**: Ensuring GHG emission estimates reflects the actual GHG emissions of national and/or state boundary.
- **Consistency**: Disclosure of all assumptions and clarity on methodologies and data sources used.
- **Completeness**: Account for and report on all GHG emissions within boundary. Justify any specific exclusions.
National Estimates

Trend of GHG Emissions from India (2005-13)

All emissions in Million tCO$_2$e
Top 10 States in 2005
Change in National GHG emissions

- **Sector-wise Emissions Growth Rate from 2005 to 2013**
  - Energy: 5.96%
  - Industry: 8.75%
  - AFOLU: 0.53%
  - Waste: 3.90%

India's emissions have grown at the rate of 5.71% (compounded annually) from 2005 to 2013.

Energy Sector is the largest contributor to GHG emissions in India.