
Riya Rachel Mohan, CSTEP
26 September 2019
GHG Platform India Workshop 2019 – The Claridges, New Delhi

Platform Partners

An initiative supported by
About GHG Platform India

Collective Civil Society Initiative

- Independently analysing and tracking **GHG emissions trends**
- Filling data **gaps** - national and state level
- Improving data **accessibility** - web database
- Facilitating policy dialogue and **decision-making**
- Assisting with India’s **climate mitigation goals**

Using publicly available information

Recognized by the MOEFCC in India’s Second Biennial Update Report

Source: GHG Platform India; Available at: [http://www.ghgplatform-india.org/](http://www.ghgplatform-india.org/)
Importance of GHG Inventories

• Identify and prioritise the activities/sectors responsible for GHG emissions
• Develop cost-effective mitigation policies
• Develop Monitoring, Reporting and Verification (MRV) protocols for each policy
• Monitor achievement towards a policy goal

- Energy & Industry are key drivers
  - Energy share increased from 55% to 59%
  - Industry share increased from 23% to 27%
- 2% differential with BUR II estimates

Source: GHG Platform India Phase 3 estimates
Key Indicators

Voluntary targets (for reduction from 2005 levels):
- COP 15 2020 target*: 20-25%
- NDC 2030 target: 33-35%

GHGPI progress estimation (till 2015): 16% reduction

* Excluding agriculture  **Source: World Bank  ***GDP (factor cost) at 2011-12 prices from CSO
Energy Sector

- Coal-dominated PEG contributed to maximum share (51.5%)
- Grid emission factor reduced from 0.90 to 0.87 due to increased RE share
- LPG demand in cooking sector doubled
- Passenger vehicles grew 4 times; increasing diesel and petrol demand
- Industrial energy-use emissions mainly contributed to by iron and steel industry
- Industrial energy intensity of GDP decreased by 24%.

Source: Analysis by CSTEP and CEEW
Industrial Processes and Product Use (IPPU) Sector

- Represents 28% of total industry sector emissions
- Increased from 101 MtCO$_2$e to 175 MtCO$_2$e – CAGR of 5.6%
- Cement production is the highest contributor

Source: Analysis by CEEW
Domestic wastewater highest contributor (63%)

Key drivers:

- Domestic Wastewater: Septic tanks and untreated discharge of wastewater
- Industry Wastewater: Pulp & paper industry
- Solid Waste Disposal: Increasing per capita waste generation and low levels of solid waste processing (~12%)

Source: Analysis by ICLEI South Asia
AFOLU sector

- Emissions declined at a CAGR of 0.47%
- Removals from land increased at a CAGR of 2.12%
- Enteric Fermentation in Livestock was a major contributor of emissions throughout the reference period.
- The removals were primarily governed by the fluctuations in forest area of the country

Source: Analysis by Vasudha Foundation
Key drivers: Population and Industrialisation


Gujarat and Odisha: Industrial emissions increased by 2.5 times (2005-2015)

Lowest GHG emitting states: Kerala and North Eastern states

Net carbon sink state: Manipur

Source: GHG Platform India Phase 3 estimates
Way Forward

Robust inventories
- Collect disaggregated activity data and develop country-specific emission factors
- Periodic, streamlined, accurate reporting to capture on-ground developments and improvements

Climate policies
- Integration of climate action policies with development goals
- Capacity building at state-level to support implementation of GHG mitigation actions
Thank you!
Potential GHG Impacts of Gujarat State’s Policies

Nikhil Kolsepatil, ICLEI South Asia
26 September 2019
GHG Platform India Workshop 2019 – The Claridges, New Delhi

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INTRODUCTION


Need for Policy Impact Evaluation

- Inform modifications and designs of existing as well as new policies & actions
- Identify the data needs for evaluation of climate impacts of policy action
- Strengthen vertical integration and reporting to better understand state contributions to Nationally Determined Contributions (NDC)

Methodology

Identify policies and KPIs  Collect publicly available data  Evaluate Impact

2005 to 2015

<table>
<thead>
<tr>
<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Energy</td>
<td>75%</td>
<td>7.9%</td>
</tr>
<tr>
<td>IPPU</td>
<td>12%</td>
<td>4.2%</td>
</tr>
<tr>
<td>AFOLU</td>
<td>9%</td>
<td>1.6%</td>
</tr>
<tr>
<td>Waste</td>
<td>3%</td>
<td>5.0%</td>
</tr>
</tbody>
</table>
SECTOR-WISE SUMMARY OF POLICIES ASSESSED AND GHG IMPACT

No. of policies assessed

8 Energy
-17 MtCO$_2$e

8 Industry
-1.9 MtCO$_2$e

10 AFOLU
-12.7 MtCO$_2$e

11 Waste
+0.7 MtCO$_2$e

- 31 MtCO$_2$e annually as of 2015 (in total)

*GHG impact of Wildlife Conservation Act, 1972 has not been included in the figures
ENERGY SECTOR: SNAPSHOT OF POLICIES ASSESSED

8 policies from supply and demand side helped reduce 54.5 MtCO$_2$e (2005 – 2015)
Total emission reduction (including electricity generated from large hydro and nuclear) : 113 MtCO$_2$e (2005 – 2015)

<table>
<thead>
<tr>
<th>Policy/Action</th>
<th>Sub Sector</th>
<th>Duration Assessed</th>
<th>GHG Impact*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subsidy Scheme for Residential Rooftop Solar Plants- 2015</td>
<td>Power</td>
<td>2015</td>
<td>0.1 MtCO2e</td>
</tr>
<tr>
<td>UDAY Scheme, R-APDRP (2)</td>
<td>Power</td>
<td>2005-2015</td>
<td>7.5 MtCO2e</td>
</tr>
<tr>
<td>PAT Scheme for Thermal Power plants -2012</td>
<td>Power</td>
<td>2012-2015</td>
<td>5.7 MtCO2e</td>
</tr>
<tr>
<td>Bus Rapid Transit System (BRTS)</td>
<td>Transport</td>
<td>2007-2015</td>
<td>0.6 MtCO2e</td>
</tr>
<tr>
<td>UJALA Scheme</td>
<td>Buildings</td>
<td>2007-2015</td>
<td>2.0 MtCO2e</td>
</tr>
<tr>
<td>Standards and Labelling Programme</td>
<td>Buildings</td>
<td>2007-2015</td>
<td>6.7 MtCO2e</td>
</tr>
</tbody>
</table>

*GHG impact figures presented are on a cumulative basis over the period of policy implementation
ENERGY SECTOR: KEY INSIGHTS AND RECOMMENDATIONS

- Slow progress towards MNRE targets (2022) because of lower rate of installation of wind and solar projects
- Extensive open access mechanism, with long-term PPA for RE installation, needs to be facilitated
- Prioritise demand-side management policies and programmes
  - Implement Energy Conservation Building Code (ECBC) in state by-laws
  - Use energy efficient irrigation pumps and solar pumps in agriculture sector
  - Promote e-mobility and provide state level incentives for acquisition of electric vehicles
INDUSTRY SECTOR: SNAPSHOT OF POLICIES ASSESSED

- Only 4 policies with direct GHG mitigation linkage – RTS, PAT I, CDM, LNG Terminal
- Remaining 4 policies indirectly promote EE uptake by offering subsidies/assistance

<table>
<thead>
<tr>
<th>Policy/Action</th>
<th>Duration Assessed</th>
<th>GHG linkages</th>
<th>GHG Impact*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rooftop Solar Scheme 2012</td>
<td>2012-2015</td>
<td>Direct</td>
<td>0.022 MtCO2e</td>
</tr>
<tr>
<td>PAT Scheme (Phase I)</td>
<td>2012-2015</td>
<td>Direct</td>
<td>2.28 MtCO2e</td>
</tr>
<tr>
<td>Clean Development Mechanism</td>
<td>2004-2015</td>
<td>Direct</td>
<td>11.16 MtCO2e</td>
</tr>
<tr>
<td>LNG Terminal Policy 2012</td>
<td>2012-2015</td>
<td>Direct</td>
<td>Not estimated due to data gap</td>
</tr>
<tr>
<td>Interest Subsidy for Technology Upgradation</td>
<td>2004-2015</td>
<td>Indirect</td>
<td>Not estimated due to data gap</td>
</tr>
<tr>
<td>Subsidy for Quality Certification (ISO 9000)</td>
<td>2004-2015</td>
<td>Indirect</td>
<td>Not estimated due to data gap</td>
</tr>
<tr>
<td>Technology and Quality Upgradation Support to MSMEs (TEQUP)</td>
<td>2010-2015</td>
<td>Indirect</td>
<td>Not estimated due to data gap</td>
</tr>
<tr>
<td>Credit Linked Capital Subsidy Scheme (CLCSS)</td>
<td>2004-2015</td>
<td>Indirect</td>
<td>Not estimated due to data gap</td>
</tr>
</tbody>
</table>

*GHG impact figures presented are on a cumulative basis over the period of policy implementation*
INDUSTRY SECTOR: KEY INSIGHTS AND RECOMMENDATIONS

• Expanding and deepening PAT scheme for energy intensive sectors can accelerate mitigation impacts—significant potential exists in textile and cement sectors

• Incentivize industries to take up fuel switch and EE projects through PAT or other carbon reduction mechanisms—represented only 9% of total registered CDM projects from 2005 to 2015

• Targeted policy and regulatory instruments can enable Rooftop Solar uptake across industries—RTS in industry spiked from 48 to 146 MW in 2017-18, driven by Net Metering Regulations (2016) & prescription of timelines that helped fast-track RTS installation

• Energy audit should be made mandatory for medium and small scale industries—programmatic approach will help policymakers identify bottlenecks and opportunities to intervene at scale

• Fuel prices need to reflect the true cost of their environmental impact—revise existing taxation system to penalize polluting fuels and incentivize cleaner ones
## AFOLU SECTOR: SNAPSHOT OF POLICIES ASSESSED

<table>
<thead>
<tr>
<th>Policy/Action</th>
<th>Duration Assessed</th>
<th>GHG Impact*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Forestry Scheme</td>
<td>2005-06 to 2015-16</td>
<td>4.7 MtCO2e</td>
</tr>
<tr>
<td>Soil &amp; Moisture Conservation (SMC)</td>
<td>2015-16</td>
<td>8.3 MtCO2e</td>
</tr>
<tr>
<td>Diversion of forests for non-forest purpose under the Forest Conservation Act, 1980</td>
<td>2005-06 to 2015-16</td>
<td>0.2 MtCO2e</td>
</tr>
<tr>
<td>Wildlife Protection Act, 1972</td>
<td>2005-06 to 2015-16</td>
<td>121.3 MtCO2e</td>
</tr>
<tr>
<td>National Food Security Mission</td>
<td>2007-08 to 2011-12</td>
<td>0.002 MtCO2e</td>
</tr>
<tr>
<td>National Mission on Micro Irrigation</td>
<td>2005-06 to 2012-13</td>
<td>0.006 MtCO2e</td>
</tr>
<tr>
<td>Pradhan Mantri Ujjwala Yojna</td>
<td>2016 to 2019</td>
<td>2.31 MtCO2e</td>
</tr>
</tbody>
</table>

Limited information to assess GHG impact for Fodder and Feed Development Programme, Cattle and Buffalo Development Programme, and Soil Health Card

*GHG impact figures presented are on an annual basis*
AFOLU SECTOR: KEY INSIGHTS AND RECOMMENDATIONS

Opportunities from Afforestation Schemes

- Decrease in forest area
- Restoration of Forest Land

**Before**
- Reduction in total biomass
- Decrease in net removals from forests

**After**
- Enhanced biomass and soil organic carbon
- Creation of an additional carbon sink of 13 MtCO2e

Key Recommendations

- Implementation of more vigorous efforts to enhance the existing carbon sink
- Develop strategies to increase livestock productivity and reduce livestock population
- Rationalized use of fertilizer
- Avoid indiscriminate use of irrigation facilities and not expand the area under crops such as paddy with high GHG emission footprint
- Promote the adoption of sustainable rice management practices in areas that grow paddy
- Wherever possible, switch to less emission intensive crops like millets
- Promote R&D to develop state specific emission factors
## WASTE SECTOR: SNAPSHOT OF POLICIES ASSESSED

<table>
<thead>
<tr>
<th>Policy/Mitigation Action</th>
<th>Duration Assessed</th>
<th>Scale of Implementation</th>
<th>GHG impact*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Municipal Solid Waste Management Project</td>
<td>2007-2015</td>
<td>Vermi-composting + 1167 tonnes per day</td>
<td>0.0002 MtCO₂e↓</td>
</tr>
<tr>
<td>Total Sanitation Campaign</td>
<td>2007-2010</td>
<td>Household latrines + 3.8 million Community latrines + 8,000</td>
<td>0.31 MtCO₂e↑</td>
</tr>
<tr>
<td>Nirmal Bharat Abhiyan (Clean India Campaign)</td>
<td>2012-2014</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Integrated Low Cost Sanitation Scheme</td>
<td>1980-2007</td>
<td>Centralized sewage treatment capacity + 1500 Million lit. per day</td>
<td>0.35 MtCO₂e↑</td>
</tr>
<tr>
<td>Nirmal Gujarat Sauchalaya Yojana</td>
<td>2008-2007</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pay and Use Toilet Scheme</td>
<td>2005-2010</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mahatma Gandhi Swachata Mission, Gujarat</td>
<td>2015-2016</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UIG and UIDSSMT Scheme</td>
<td>2005-2014</td>
<td></td>
<td></td>
</tr>
<tr>
<td>National River Conservation Programme (NRCP)</td>
<td>1995-2017</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Swarnim Jayanti Mukhya Mantri Shaheri Vikas Yojana</td>
<td>2009-2015</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

No information available on policies impacting industrial wastewater

*GHG impact figures presented are on an annual basis
Higher methane generation from improved sanitation offers an opportunity

- **Policy actions** deliver improvements in sanitation and social benefits and lead to carbon-lock in as well.

- **Significant potential** to integrate low carbon solutions during infrastructure creation.
  - Adoption of methane recovery systems in centralized and decentralized anaerobic treatment.
  - Improved performance management of aerobic STPs.

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### Key Insights

<table>
<thead>
<tr>
<th>Discharge Method</th>
<th>Methane generation potential (MCF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sea, Lake, River discharge</td>
<td>0.1</td>
</tr>
<tr>
<td>Discharge to land</td>
<td>0</td>
</tr>
<tr>
<td>Latrines (family)</td>
<td>0.1</td>
</tr>
<tr>
<td>Latrines (communal)</td>
<td>0.5</td>
</tr>
<tr>
<td>Anaerobic digester/reactor</td>
<td>0.8</td>
</tr>
<tr>
<td>Aerobic treatment (not well managed)</td>
<td>0.3</td>
</tr>
</tbody>
</table>
Madhya Pradesh Mitigation Action Plan (2021-2030)

Presented By
Deepa Janakiraman
CEEW

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GHG Platform India workshop 2019 – The Claridges, New Delhi

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MADHYA PRADESH DISPLAYS THE FOURTH HIGHEST GROWTH RATE IN GDP

Key economic drivers of GDP

- Agriculture and mining – 47%
- Manufacturing – 8%
- Services (with construction) – 45%

Emissions increased from 99 MTCO2e in 2005 to 173 MTCO2e in 2015 at a CAGR of 5.7%

- Emissions intensity (tCO2e/INR lakh) shows a downward trend reducing at a CAGR of 3.5% between 2005 and 2014
- Per capita emissions displays an increasing trend at 3% CAGR between 2005 and 2014

Source: GHG Platform India analysis (draft)
PROJECTED EMISSIONS (BAU) INDICATE AN INCREASE OF 7% ANNUALLY BETWEEN 2015 AND 2030

- Energy sector emissions to increase more than three-folds between 2005 and 2015
  **Key driver – Power generation**

- Industrial energy-use and IPPU emissions are projected to increase two-folds by 2030 from 2015 levels
  **Key drivers – Cement, Aluminium and Refining**

- AFOLU is the only sector that displays a negative trend, emissions will reduce by 5% between 2015 and 2030
  **Key drivers – Livestock (positive emissions)**
  **Forestry (Negative emissions)**

- Waste sector emissions are projected to increase by 1.5 times in 2030 from 2015 levels
  **Key driver – Domestic Wastewater and Solid Waste**

Source: GHG Platform India analysis (draft)

- Enteric Fermentation in bovine animals, mainly cattle.

Existing State Actions

3 policies viz. (Breed Improvement, Accelerated Fodder Development and Vats Palan Yojna) could have a bearing on emissions from the Livestock Sector

Mitigation Opportunities

- Feed Improvement
- Increased productivity and reduced population
- Quantifying the mitigation potential of the proposed actions is uncertain due to inadequate data


- CAGR: -1.22%

<table>
<thead>
<tr>
<th>Year</th>
<th>MTCO2e</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>20.03</td>
</tr>
<tr>
<td>2015</td>
<td>17.72</td>
</tr>
<tr>
<td>2030</td>
<td>14.74</td>
</tr>
</tbody>
</table>

Source: Vasudha Foundation analysis (draft)
AFOLU Sector: Land

- Diversion of forest land for non forest purposes

Existing State Actions
Current policy impact evaluation – A total of five policies were found to reduce 14.28 MTCO2e per annum (excluding Wildlife Protection Act)

Mitigation Opportunities
- Minimizing diversion of forest land
- Expand protected area network
- Maximize afforestation on non forest land through social forestry schemes.
- Implementation of these actions has a mitigation potential of 138.26 tCO2e/ha/annum

CAGR: -1.35%

Source: Vasudha Foundation analysis (draft)
AFOLU Sector: Aggregate Sources and non-CO₂ emissions sources on land

- Rice Cultivation
- Agriculture Soils

Existing State Actions
- Current policy impact evaluation – 3 policies viz. (National Food Security Mission, Soil Health Card and National Mission on Micro Irrigation) have a bearing on emissions from the Agriculture sector.
- However, quantification of impacts of these policies is uncertain due to inadequate data

Mitigation Opportunities
- Regulation of area under rice
- Rationalization/ Minimization of fertilizer usage
- More efficient methods of rice cultivation can lead to mitigation of approximately 4.88 MTCO₂e per annum. Minimized fertilizer consumption could further lead to emission reduction.
Energy Sector: Public Utilities

Existing State Actions
- State specific RE policies accelerated RE installations
- MP Policy for Decentralized Renewable energy -2016 and RESCO model: Increased RTPV installations
- RE installations increased from 36 MW in 2005 to 2,647 MW in 2015 (12% share of total installed capacity in 2015)
- Rewa Ultra Mega Solar (RUMS) project accounting for 750 MW is the first project to break the grid parity barrier
  - Reverse bidding in RUMS resulted in tariff of INR 2.97/kWh
- RE installation (2.6 GW in 2015) led to highest amount of CO₂ savings
- T&D loss reduced from 43.48% to 26.01% between 2005-15

Proposed Mitigation Actions
- Increase RE installed capacity at rate of 1.6 GW per year
  - Extensive open access mechanism with long term PPA to accelerate RE installation
- Reduce T&D loss by to 13% by 2030
  - With smart meters
  - Introduce High Voltage Distribution System (HVDS)

- Coal based electricity generation forms almost the entirety of emissions from power generation in the state.
- Installed capacity of coal fired plants increased from 4 GW in 2005 to 8 GW in 2015

Source: CSTEP analysis (draft)
Energy Sector: Transport and Buildings

Existing State Actions

- UJALA scheme and Standards and Labelling scheme are the major mitigation action in buildings
- Key mitigation action in transport is Bus Rapid Transit System (BRTS)


- Diesel and motor spirit use in transport is the key driver of emissions from the sector
- Residential use of kerosene and LPG is the key driver for emissions in the buildings sector

Proposed Mitigation Actions

- Introduction of Energy Conservation and Building Code (ECBC) in residential and commercial sector
- Continue UJALA scheme and Standards and Labelling scheme
- Expand BRTS and metro system

Source: CSTEP analysis (draft)
Industrial Energy-use and IPPU

- 3rd largest producer of cement in India, caters to 13% of national demand
- Aluminium production and petroleum refining
- Coal and lignite contributes to more than 80% of fuel combustion emissions

Existing State Actions
  - 2016 Policy for Rooftop Solar: 0.07 MTCO2e
  - PAT – Cycle I: 1.03 MTCO2e
  - PAT – Cycle II: 1.46 MTCO2e
  - Clean Development Mechanism: 4.16 MTCO2e

- Schemes with indirect impact on emissions mitigation:
  - Technology Upgradation Fund Scheme
  - Technology and Quality Upgradation Support (TEQUP) for MSMEs
  - Credit Linked Capital Subsidy Scheme (CLCSS) for technology upgradation
  - Zero Defect, Zero Effect (ZED) scheme
  - ISO 9000/14001

Source: CEEW analysis (draft)
## Industrial Energy-use and IPPU

### Mitigation opportunities

<table>
<thead>
<tr>
<th>Actions</th>
<th>Emissions Mitigation</th>
<th>High</th>
<th>Medium</th>
<th>Low</th>
</tr>
</thead>
</table>
| • Waste derived fuels in cement sector  
• State awards on emissions intensity improvement by industries | • RDF – 2.27 MTCO2e  
• State awards – Not estimated | • Promote biogas in select sectors  
• Promote industrial rooftop  
• R&D technology and demonstration centers  
• Mandatory energy audits | Awareness and training on energy monitoring/conservation |
| • RDF – 2.27 MTCO2e  
• State awards – Not estimated | • Biogas – 0.54 MTCO2e  
• Industrial rooftop – 1.18 MTCO2e  
• R&D – 2.28 MTCO2e  
• Energy audits – Not estimated | Training – Not estimated |

**Total mitigation (by 2030): 6.67 MTCO2e**

Source: CEEW analysis (draft)
**Waste Sector: Solid Waste**


- Rising per capita waste generation rates
- Low levels of solid waste processing (~12% in 2015) leading to high MSW volumes going to disposal

**Existing State Actions**

- **M.P. Action Plan on MSW Management, 2018**: cluster-based approach for integrated MSWM and waste to energy & composting in 26 clusters (378 ULBs) with PPP focus - *driving improvements in MSW*
- Treatment/processing (2018) : 31.5%
- 6 disposal sites converted to scientific landfills
- MSW processing facilities operational in 3 clusters (900+ TPD capacity)
- Recognized as best performing state for MSW in Swacch Survekshan

**Mitigation Opportunities**

- Fast-track setup of proposed waste to energy and compost plants in all 26 clusters
- 100% segregated door to door waste collection
- Scientific closure of dumpsites, construction of sanitary landfills
- Processing existing legacy waste in dumpsites
- Regulate and manage construction and demolition (C&D) waste, plastic waste, and recyclables

**Source:** ICLEI South Asia analysis (draft)
Waste Sector: Domestic Wastewater


- Septic tanks and untreated discharge of wastewater are primary emission sources
- Low sewer network coverage (~11% in 2015 in urban areas)
- Inadequate sewage treatment (15% of total generation in 2015)

Existing State Actions

- Improved sanitation and treatment capacity from 2005 -2015:
  - 75 lakh household latrines
  - 424.15 MLD of treatment
- M.P. Policy for Wastewater Recycling and Faecal Sludge Management, 2017
- AMRUT targets 50% sewer network coverage by 2020
- Large treatment capacity augmentation underway (~1500 MLD under construction)
- Increase in emissions of 2.2 MTCO2e observed between 2005 and 2015

Mitigation Opportunities

- Adopting methane recovery in anaerobic treatment STPs
- Improved management of aerobic STPs
- Expand sewer network in sync with treatment capacity augmentation
- Promote decentralized treatment solutions
- Connect septic tanks to sewer network
- Promote recycling/reuse of wastewater

Source: ICLEI South Asia analysis (draft)
### Existing State Actions

- **Industrial Promotion Policy, 2014**
  - Offers capital subsidy for wastewater management, water conservation solutions
  - Promotes common effluent treatment facilities with private sector participation
- Adoption of **zero liquid discharge solutions** sought by MPPCB

### Mitigation Opportunities

- Methane recovery from anaerobic systems
- Reduction of process wastewater generation at source (pre-effluent treatment)
- Prioritize actions in Pulp and Paper and Fertilizer units
- Expand to Dairy, Meat, Sugar and Tannery units afterwards

### Emission drivers (2005-2015)

- **Pulp and Paper and Fertilizer industry with high organic wastewater volumes** (~90% of emissions)

Source: ICLEI South Asia analysis (draft)
CONCLUSION

- **AFOLU** – Effective implementation of policies will aid in maintaining a similar forest cover over the years from 2019 to 2030 – it will mitigate 45.1% of the emissions in 2030 (BAU). Further reduction is possible by reducing the headcount of non-productive livestock. Efficiency in cultivation of paddy will lead to further reductions.

- **Energy** - Schemes towards promotion of RE, reduction of T&D losses, ECBC, expansion of Ujjala, and BRTS will mitigate 9% of emissions from the energy sector in 2030 (BAU)

- **Industry Energy-use and IPPU** - Increased usage of alternate fuels, alternate cement (LC3), and energy efficiency measures will result in mitigation of 11% of manufacturing emissions in 2030 (BAU)

- **Waste** - Enabling setting up of waste to energy and compost plants, methane recovery in anaerobic treatment STPs, and promoting reuse of wastewater among other measures will help in mitigating 45% of waste sector emissions in 2030 (BAU)
ALIGNING WITH SUSTAINABLE DEVELOPMENT GOALS

2. Zero Hunger
3. Good Health and Well-Being
7. Affordable and Clean Energy
8. Decent Work and Economic Growth
9. Industry, Innovation and Infrastructure
11. Sustainable Cities and Communities
12. Responsible Consumption and Production
13. Climate Action
15. Life on Land
WRI INDIA is a research organization that turns big ideas into action at the nexus of environment, economic opportunity and human well-being.

**Scale it**
Leverage partnerships

**Count It**
Collect Data and Analyze Findings

**Change It**
Propose solutions and demonstrate pilot
TECHNICAL REVIEW PROCESS

1st Layer Review

2nd Layer Review

GHG Estimates Submission

Feedback

Finalize GHG estimates
QUALITY CHECK BENEFITS

- GHG estimates prepared under the platform informs the national process which can help meet the reporting requirements internationally e.g. National inventory prepared in accordance with the relevant COP decisions (e.g., 17/CP.8);

- To ensure continuity through the development of national capacities and capabilities;

- To ensure the sustainability of the GHG preparation process;

- Will also help with the regular preparation of biannual reports in accordance with relevant decisions under the UNFCCC process;

- To foster consistent estimation approaches;

- To coordinate responses to requests for information;

- To ensure high quality and objective emissions estimation information.
BROADER OVERVIEW: GHG ESTIMATES

1. Background sectoral information
   Context, Coverage (GHGs, time series and geographical), Institutional background, Assessment of completeness, Data collection and Archiving process

2. GHG emission trends
   Aggregated GHG emissions trend; Trend in GHG emissions by type; Key drivers.

3. State-wise GHG emission estimates
   Sectoral assessment of GHG estimates for all the states,

4. Identification of key source categories
   Following 2006 IPCC guidelines for national GHG inventories

5. Sectoral QC/QA
   Quality control checks implemented (sector-wise) and generally as per 2006 IPCC guidelines for national GHG inventories

6. GHG estimates calculation
   Detailed methodology to calculate emissions with focus on sources of AD, EF, etc. and sample calculation for ease of understanding

7. Comparison with National GHG estimates
   Comparison of GHGPI estimates with national GHG emission numbers like BURs

8. Sectoral recommendation
   The sectoral partners provide recommendations as to how the GHG estimates could be further improved.
FEW OBSERVATIONS FROM REVIEWERS

ACTIVITY DATA

Tier 1, 46.15%
Tier 2, 34.61%
Tier 3, 3.84%
Tier 1 & 2, 15.38%

EMISSION FACTOR

CS, 42.31%
CS & D, 15.38%
D, 42.31%
Tier 1, 46.15%
Tier 2, 34.61%
RECALCULATION

- As GHG estimation capacity and data availability improve, the methods used for preparing GHG estimates is also refined;

- **34%** of the identified key source categories witnessed recalculation;

- Main reasons:
  - Use of updated AD/EF;
  - Change in the approach of methodology.
SAPCC FRAMEWORK DEVELOPMENT

Research & Development
Desktop Research of available standard; guidance and SAPCCs
Finalizing on the components of SAPCC framework (mitigation component only)

Consultation
Extensive consultation with various stakeholders
Understanding the expectation and requirement of states

Finalization
Took into account, all the inputs and suggestion received;
Comprehensive framework – ready-to-use by any state
The framework for revising the SAPCC has been designed by referring internationally accepted standards like Mitigation Goal Standard, Policy and Action Standard and guidelines issued by Ministry of Environment, Forest and Climate Change to State Nodal Agencies.
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