

# Trend Analysis of GHG Emissions of MIZORAM

GHG Platform India is a civil society initiative providing an independent estimation and analysis of India's Greenhouse Gas (GHG) emissions across key sectors.

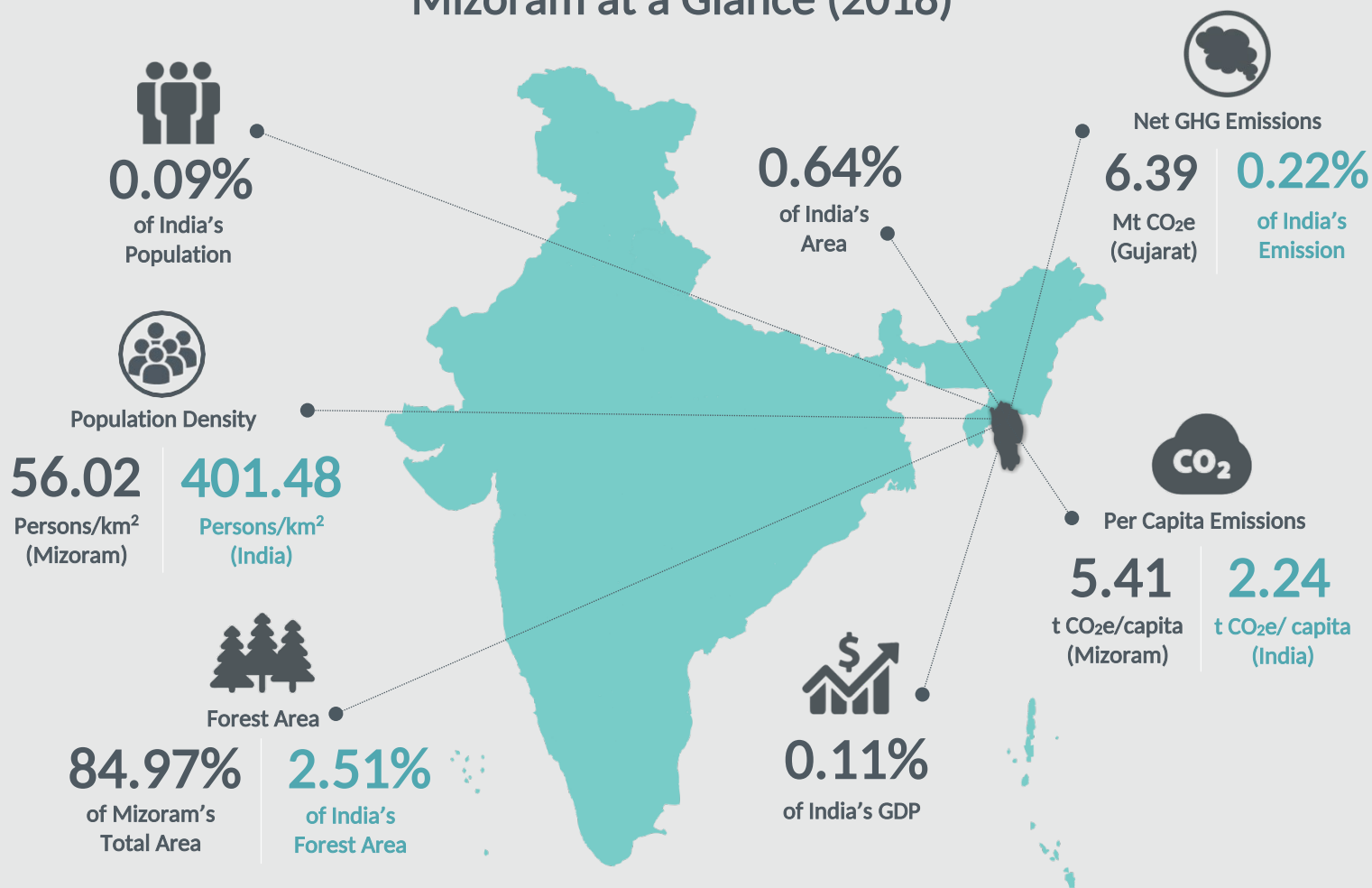
The Platform seeks to add value to the various ongoing GHG emission estimation efforts by helping address existing data gaps and data accessibility issues, extending beyond the scope of national inventories to state inventories, and by increasing the volume of analytics and policy dialogue on India's GHG emissions sources, profile, and related policies.

The initiative estimates and assesses GHG emissions and removals from the following sectors:



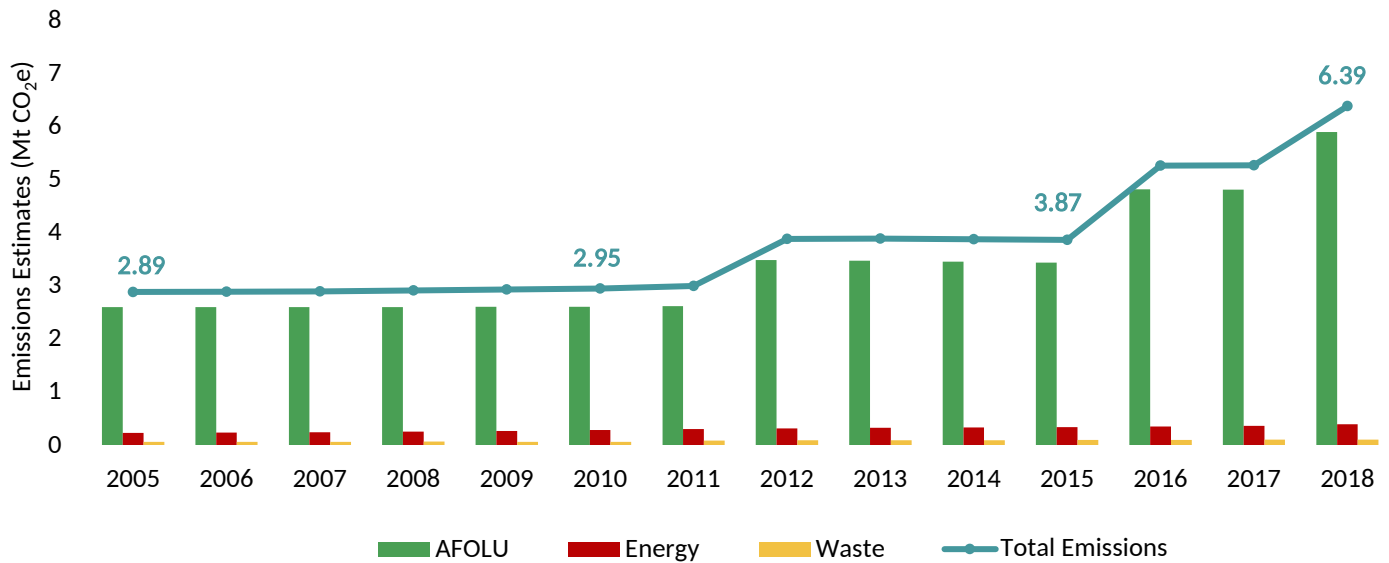
\*Fuel combusted for captive electricity generation (auto-producers) and direct fuel combustion (industrial energy) has been reported under Energy sector.

## Mizoram at a Glance (2018)



# Economy-wide Emissions Estimates

Figure 1: GHG Emissions Estimates of Mizoram (2005 to 2018)



Emissions of Mizoram increased at a rate of 6.30% (compounded annually) from 2.89 Mt CO<sub>2</sub>e in 2005 to 6.39 Mt CO<sub>2</sub>e in 2018 (Figure 1). Mizoram’s rapid growth of emissions during the reference period was due to increase in emissions from the Agriculture, Forest, and Other Land Use (AFOLU) sector. In 2005, the share of AFOLU sector in the economy-wide emissions of Mizoram was ~90%, while the Energy and Waste sectors accounted for ~8% and ~2%, respectively. As can be seen in Figure 2, in 2018, the share of emissions from AFOLU had increased to ~92% while that of the Energy sector declined to ~6%, and Waste sector remained the same. No Industrial Processes and Product Use (IPPU) emissions were reported from Mizoram for the reference period.

Figure 2: Sector-wise Contribution (Mt CO<sub>2</sub>e) and Percentage Share in Economy-wide GHG Emissions of Mizoram

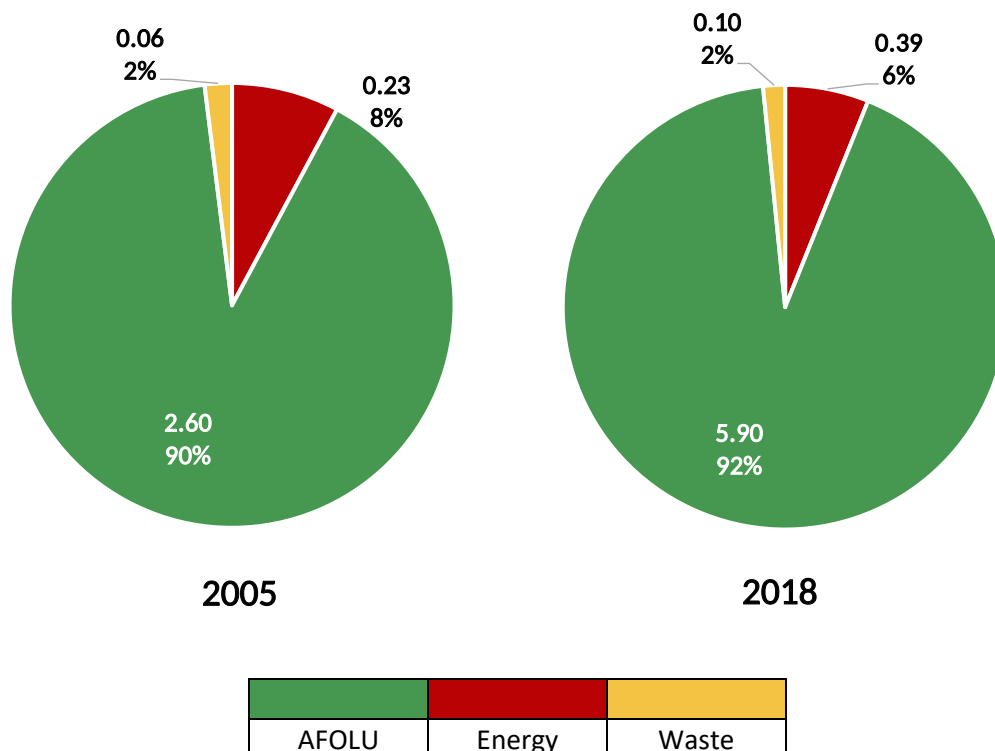
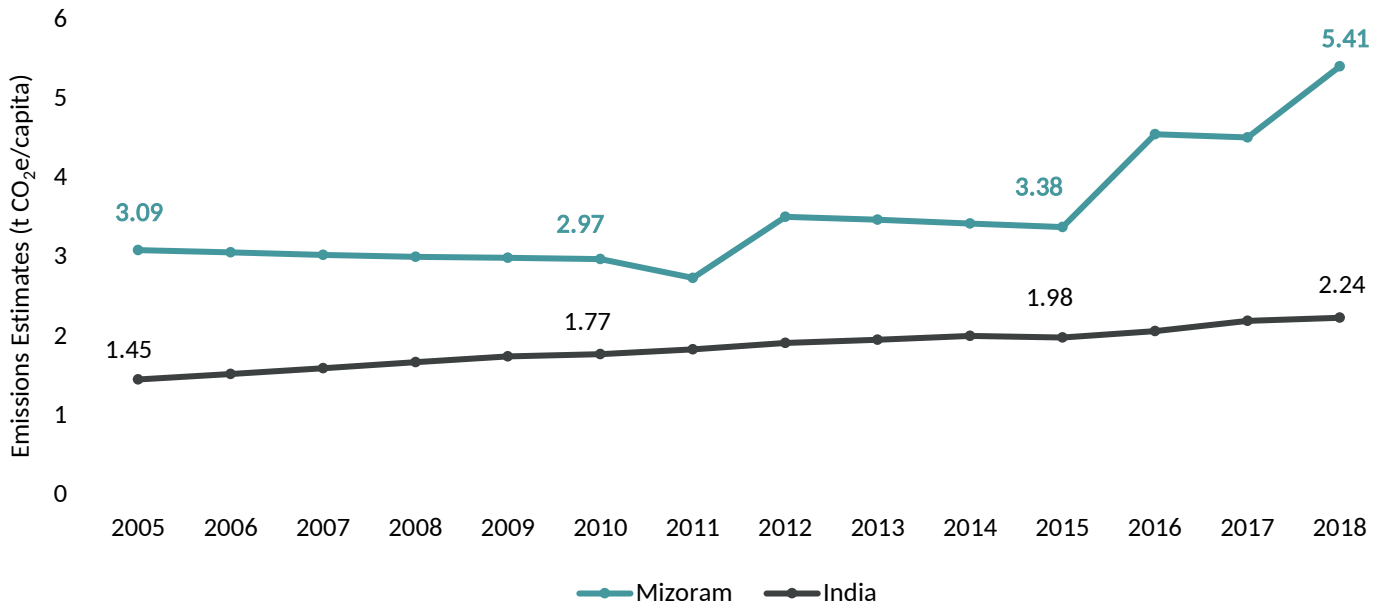


Figure 3: Per Capita GHG Emissions of Mizoram and India (2005 to 2018)



The per capita emissions of Mizoram were higher than the per capita emissions of India. Mizoram's per capita emissions increased at a compounded rate of 4.41% from 3.09 t CO<sub>2</sub>e/capita in 2005 to 5.41 t CO<sub>2</sub>e/capita in 2018, which was higher than that of India (~3.41%).

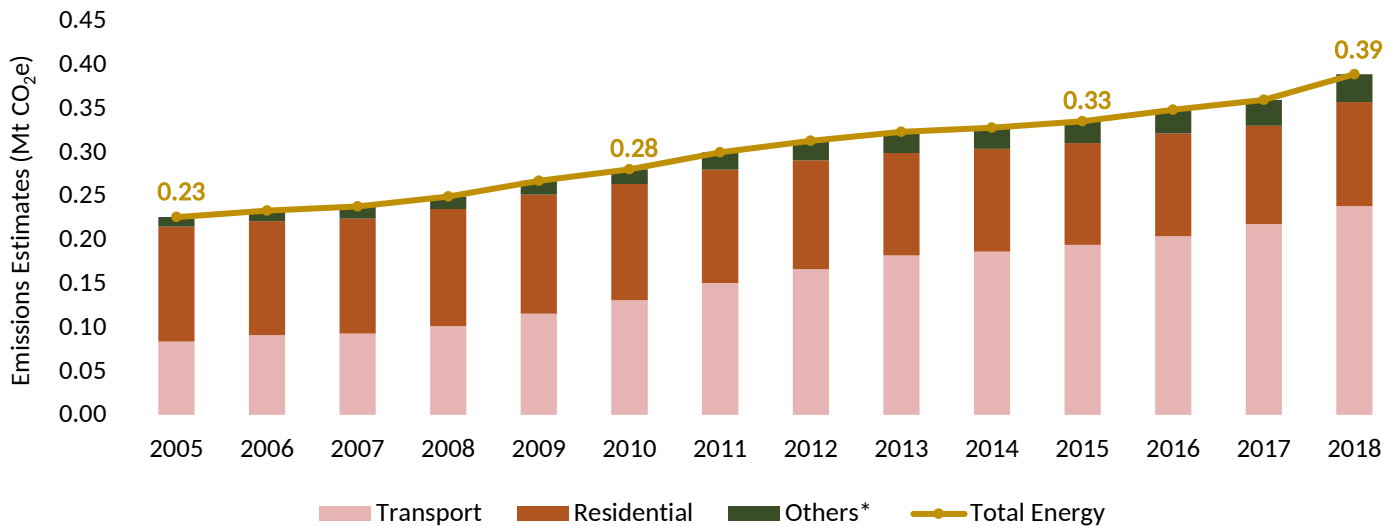


# Energy Sector

The Energy sector emissions comprise of emissions from Fuel Combustion and Fugitive Emissions. Fuel Combustion includes emissions from Public Electricity Generation, Transport, Captive Power Plants, Industries, Agriculture, Commercial, and Residential categories. Fugitive Emissions are due to Fuel Production.

The Energy sector of Mizoram accounted for ~6% of the economy-wide emissions in 2018. Emissions from the Energy sector increased at a CAGR of 4.27% from 0.23 Mt CO<sub>2</sub>e in 2005 to 0.39 Mt CO<sub>2</sub>e in 2018 as shown in Figure 4.

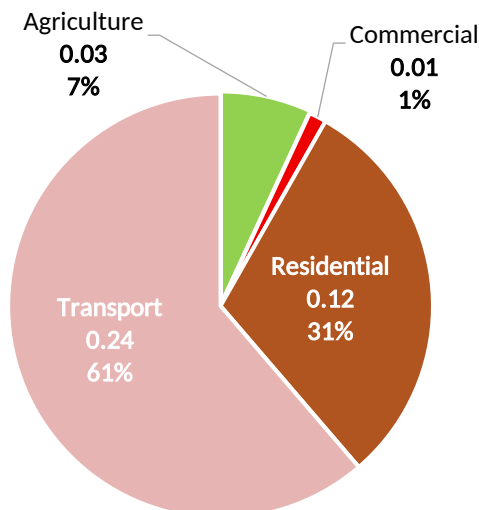
Figure 4: GHG Emissions Estimates of Energy Sector - Mizoram (2005 to 2018)



Within the Energy sector, Transport category was the major contributor to GHG emissions with a share of ~61% of the total Energy emissions in 2018. This was followed by Residential and Agriculture categories at 31% and 7%, respectively (see Figure 5).

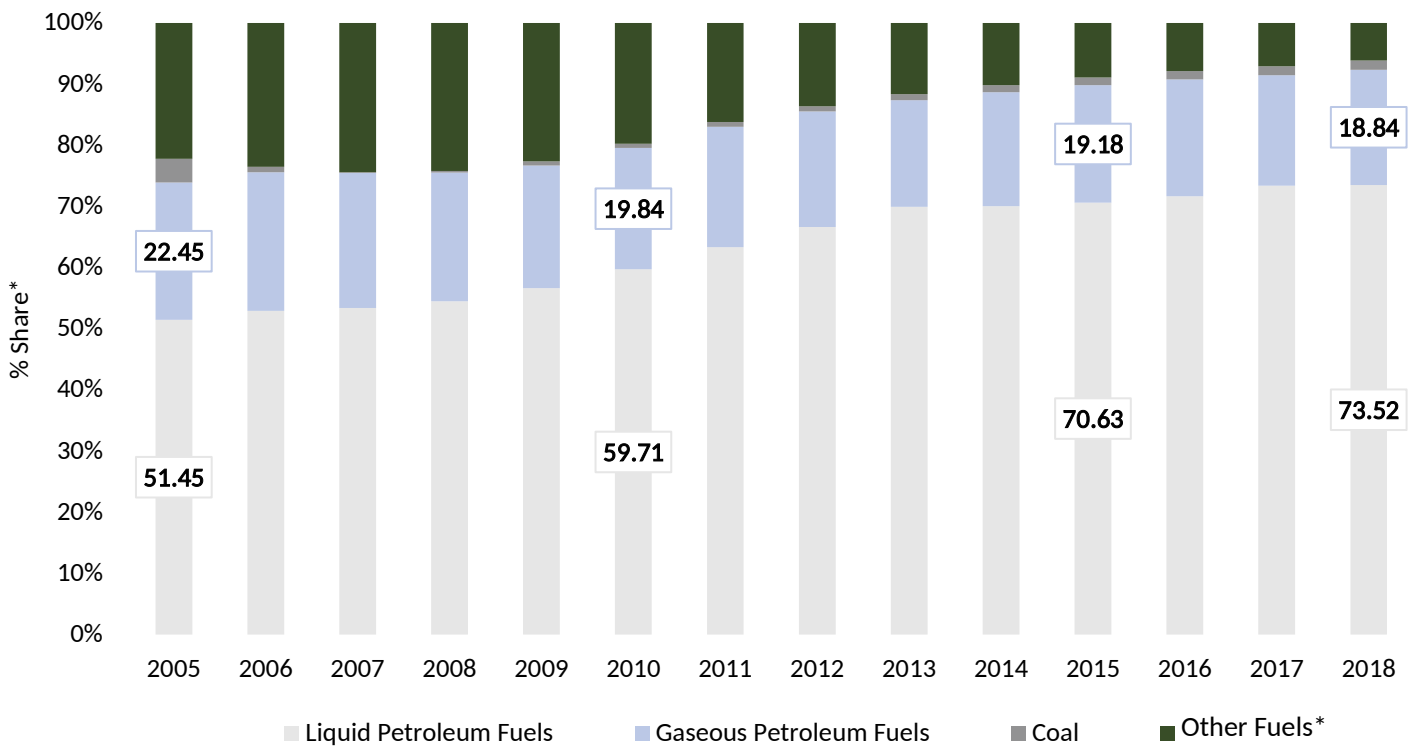
Within the Fuel Combustion sub-sector, emissions from Liquid Petroleum Fuels were the major contributor, with an average share of ~63% across the reference period (see Figure 6). This was followed by emissions from combustion of Gaseous Petroleum Fuels with an average share of ~20%, between 2005 and 2018.

Figure 5: Category-wise Emissions (Mt CO<sub>2</sub>e) and Percentage Share in Total Energy Sector Emissions (2018)



\* Others include: Other Uses of Soda Ash, Lime Production, Ceramics, Lubricant Use, Paraffin Wax Use

Figure 6: Percentage Share of GHG Emissions by Fuel Type due to Fuel Combustion in Energy Sector (2005 to 2018)



**\*Notes:**

1. Coke is included in Coal because the bifurcation of pet-coke and coke was not available
2. Gaseous Fuels - natural gas, LPG and other gaseous fuels
3. Liquid Petroleum Fuels - ATF, diesel, kerosene, motor spirit and other liquid fuels
4. Other Fuels comprises of firewood and charcoal



## IPPU Sector

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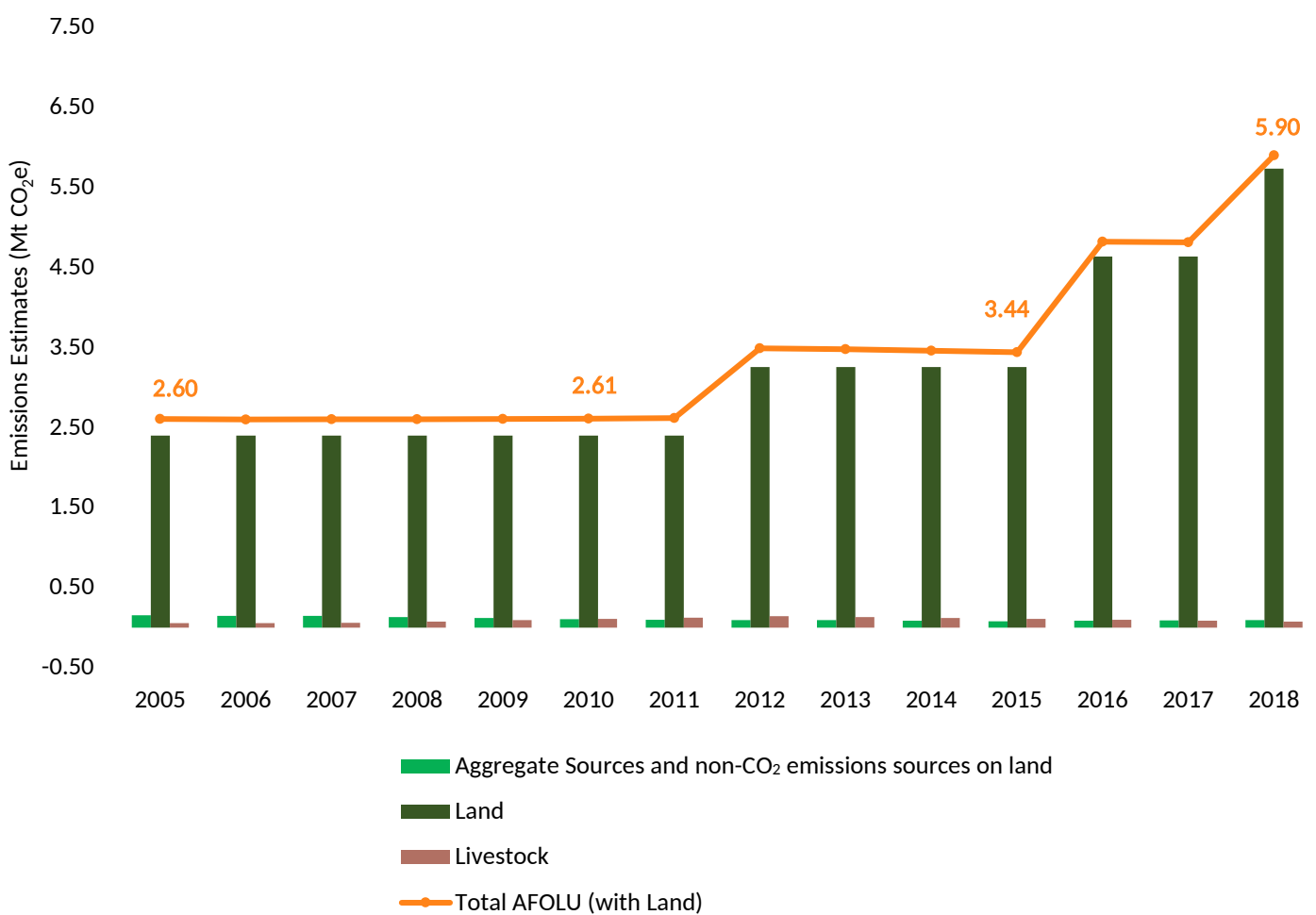
Emissions from the Industrial Processes and Product Use (IPPU) sector are largely driven by Chemical, Metal, Mineral Industries and Non-Energy Products from Fuels and Solvent Use. Industrial activities as listed by IPCC to be responsible for GHG emissions were not present in Mizoram, therefore, no IPPU emissions were registered in Mizoram throughout the reference period.



Emissions from the Agriculture, Forestry and Other Land Use (AFOLU) sector arise from three main sub-sectors, namely Livestock, Land and Aggregate Sources and Non-CO<sub>2</sub> Emissions Sources on Land\*. AFOLU sector represented ~92% of the total economy-wide emissions in Mizoram in 2018. The total AFOLU sector emissions grew at a CAGR of 6.49% from 2.60 Mt CO<sub>2</sub>e in 2005 to 5.90 Mt CO<sub>2</sub>e in 2018, as illustrated in Figure 7.

The Land sub-sector was the major contributor to the GHG emissions throughout the reference years. In this sub-sector, an increase was observed post 2011 due to increase in emissions from Other Land, Settlements and Grassland categories. Further, another increase was observed from 2016 onwards, which can be attributed to the increase in emissions from the Forest Land category. This in turn is a result of steady reduction in forest area of the state.

**Figure 7: GHG Emissions Estimates of AFOLU Sector - Mizoram (2005 to 2018)**

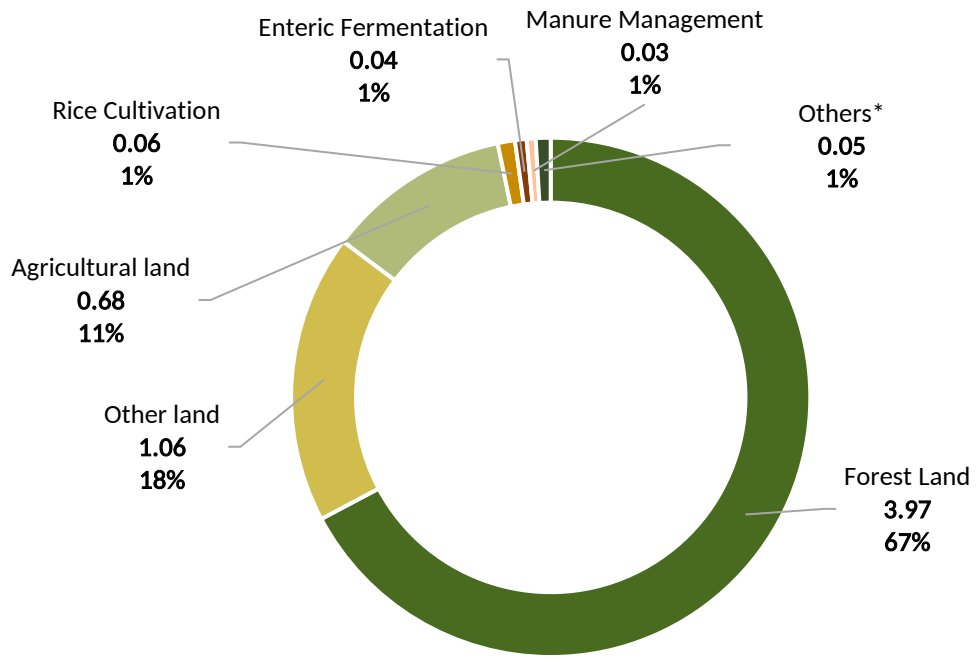


The Land sub-sector had an average share of ~94% of the total AFOLU emissions between 2005 and 2018. Within the Land sub-sector, Forest Land was the major contributor to total AFOLU emissions with the share of 67% in 2018 (see Figure 8). Emissions from this category increased from 1.49 Mt CO<sub>2</sub>e in 2005 to 3.97 Mt CO<sub>2</sub>e in 2018 with a CAGR of 7.84%.

Besides emissions from Land sub-sector, the categories of Rice Cultivation, Enteric Fermentation and Manure Management each had minor contributions of around 1%, during the reference period (see Figure 8).

\* The sub-sector called 'Aggregate Sources and Non-CO<sub>2</sub> Emission Sources on Land' includes emissions from Rice Cultivation, Agriculture Soils and Biomass Burning in Cropland and Forestland.

Figure 8: Category-wise Emissions (Mt CO<sub>2</sub>e) and Percentage in Total AFOLU Emissions (2018)



\* Others comprises of Agriculture Solis, Biomass Burning in Cropland and Forest Land, Grassland and Settlements.





Solid Waste Disposal, Domestic Wastewater and Industrial Wastewater are the key sources of GHG emissions in the Waste sector. The Waste sector contributed to almost 2% of economy-wide emissions of Mizoram in 2018. GHG emissions from the Waste sector of Mizoram grew at a CAGR of 4.56% from 0.06 Mt CO<sub>2</sub>e in 2005 to 0.10 Mt CO<sub>2</sub>e in 2018. An increase in the overall Waste sector emissions was observed in 2011 which can be attributed to higher emissions from the Domestic Wastewater sub-sector (see Figure 9).

Figure 9: GHG Emissions Estimates of Waste Sector - Mizoram (2005 to 2018)

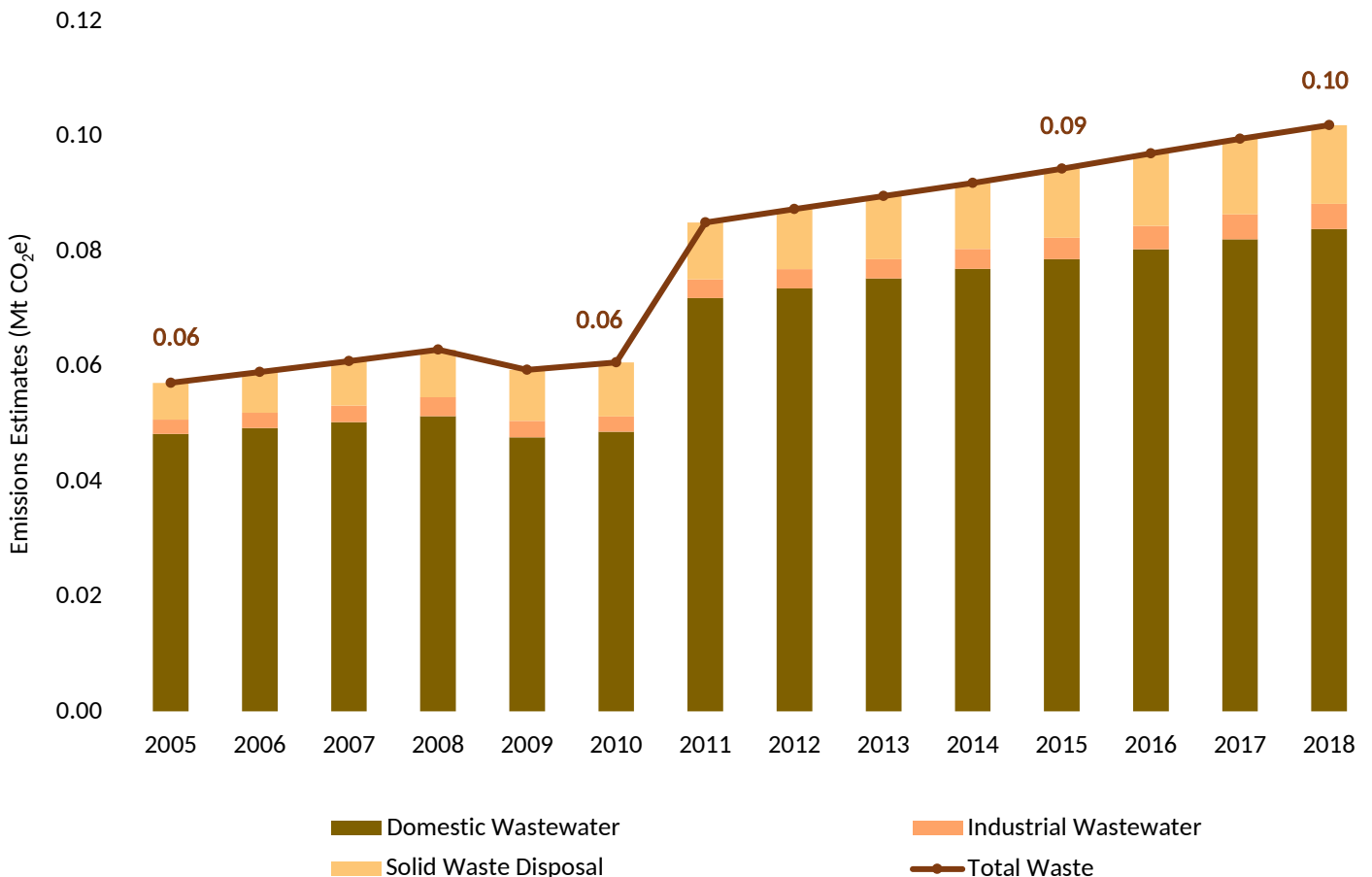
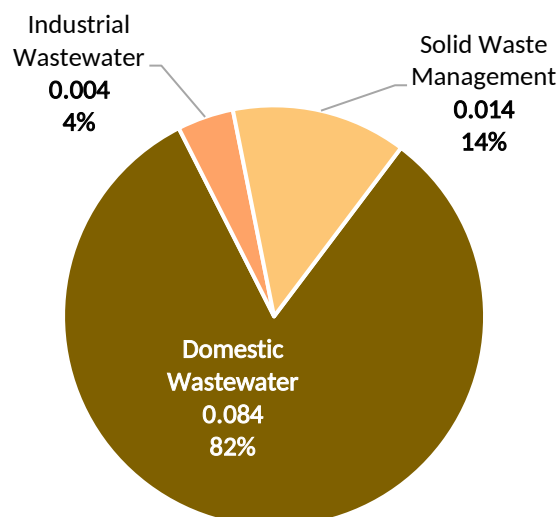


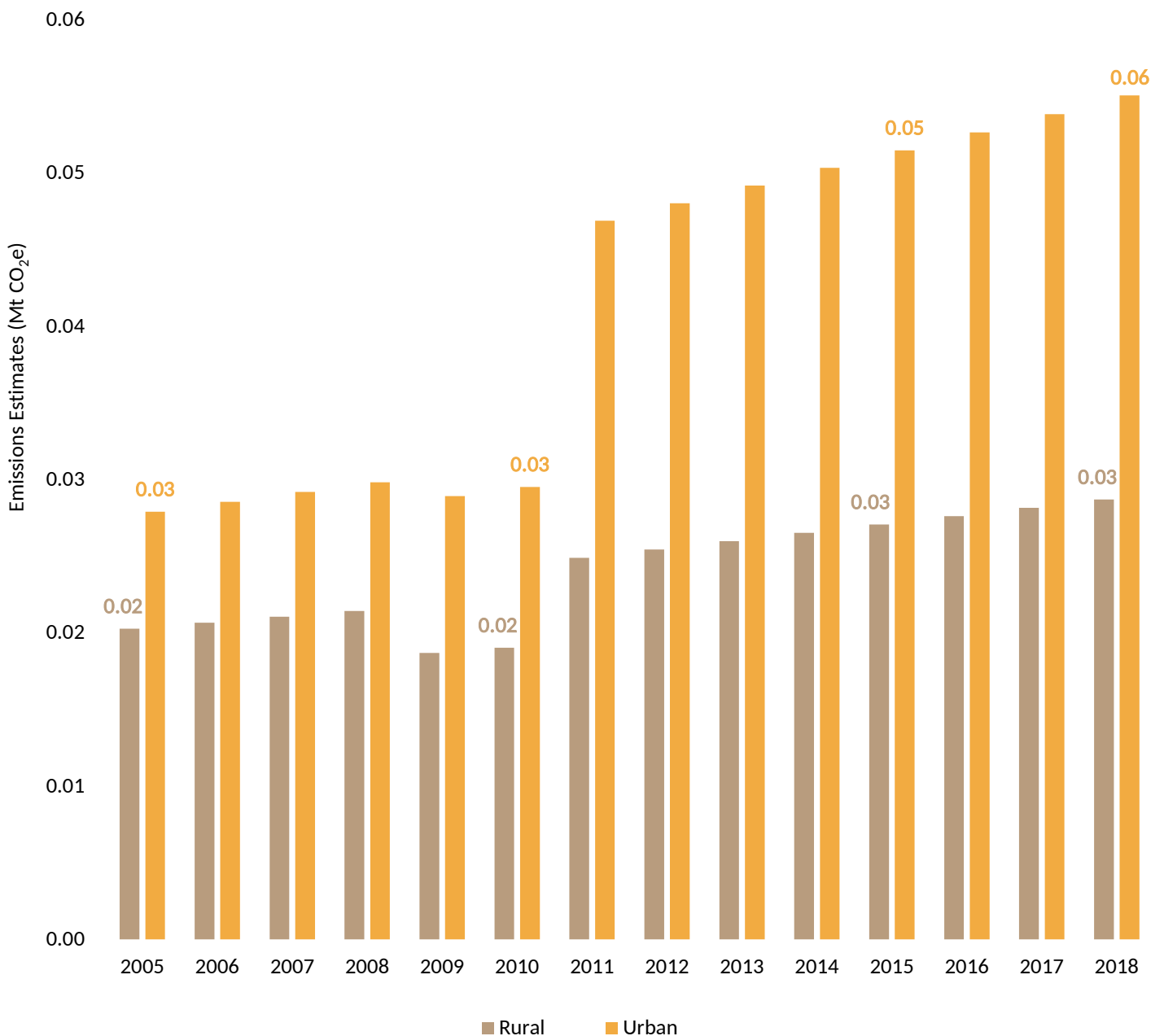
Figure 10: Sub-sector Emissions (Mt CO<sub>2</sub>e) and Percentage Share in Total Waste Sector Emissions (2018)



Discharge of untreated wastewater and use of septic tanks are the key drivers of emissions due to Domestic Wastewater sub-sector. Domestic Wastewater had a share of 82% in the total Waste sector emissions of Mizoram in 2018. Approximately 14% of the Waste sector emissions were from Solid Waste Disposal, which grew at an estimated CAGR of 5.98% from 0.006 Mt CO<sub>2</sub>e in 2005 to 0.014 Mt CO<sub>2</sub>e in 2018. Industrial Wastewater accounted for nearly 4% of Waste sector emissions in 2018 and grew at a CAGR of 4.56% (0.002 Mt CO<sub>2</sub>e in 2005 to 0.004 Mt CO<sub>2</sub>e in 2018) (see Figure 10).

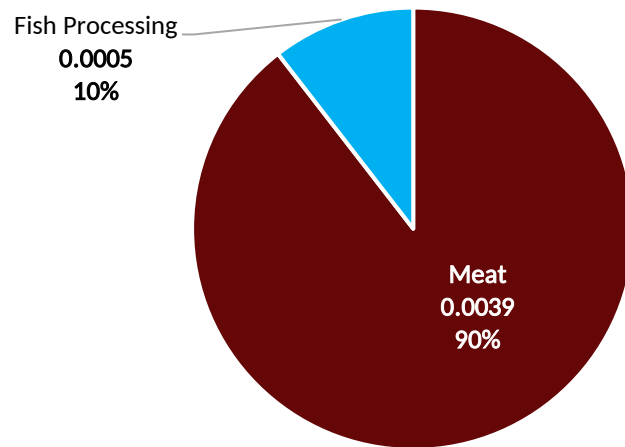
Emissions from Domestic Wastewater of both rural and urban areas grew at a CAGR of 4.35% from 0.05 Mt CO<sub>2</sub>e in 2005 to 0.08 Mt CO<sub>2</sub>e in 2018. Almost 66% of Domestic Wastewater emissions were from the urban areas of Mizoram, in 2018, as shown in Figure 11.

**Figure 11: Area-wise GHG Emissions Estimates of Domestic Wastewater (2005 to 2018)**



The Meat Industry was the major contributor to Industrial Wastewater emissions with a share of ~90% in 2018. This was followed by Fish Processing (~10%) as illustrated in Figure 12.

Figure 12: Category-wise Emissions (Mt CO<sub>2</sub>e) and Percentage Share in Industrial Wastewater Emissions (2018)





The GHG Platform India is a civil society initiative providing an independent estimation and analysis of India's Greenhouse Gas (GHG) emissions across key sectors, namely- Energy, IPPU, AFOLU and Waste.

The Platform comprises of the following civil society:



The **Council on Energy, Environment and Water (CEEW)** is one of South Asia's leading not-for-profit policy research institutions. It uses data, integrated analysis and strategic outreach to explain – and change – the use, reuse, and misuse of resources.

The **International Maize and Wheat Improvement Center (CIMMYT)** is the global leader in agricultural research for development in wheat and maize-based farming systems.

**Center for Study of Science, Technology and Policy (CSTEP)** is a not for profit research organisation incorporated in 2005 u/s 25 of The Companies Act, 1956.

**ICLEI - Local Governments for Sustainability** is a leading global network of over 1,500 cities, towns and regions committed to building a sustainable future.

**Vasudha Foundation**, set up in 2010, is a not for profit organisation, working in the clean energy and climate policy space.

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