



# CHHATTISGARH

POPULATION: 25,545,198 (2011)

GHG OBJECTIVES: INDIAN NDCS + UNDER2 MOU

## Forests to link adaptation and mitigation

### Climate policy governance and integration

Chhattisgarh's economy is highly dependent on [climate-sensitive sectors](#) (agriculture, forests, animal husbandry, etc.). The effects of climate change, aggravating over time, already take a toll on these sectors and extreme events all contribute to increasing the sensitivity of farmers and worsening poverty in a state where over half of the population lives [below the poverty line](#), more than twice the country's average.

The state of Chhattisgarh has not set forth quantified commitments, but has repeatedly assured its [contribution to national NDCs](#): by 2030, [India pledges](#) a reduction of emissions intensity of its GDP by 33 to 35% (baseline: 2005), 40% non-fossil fuel based energy, and 2.5 to 3 billion tonnes of CO<sub>2</sub>e of additional carbon sinks. Since 2017, Chhattisgarh is also an endorser of the Under2 MoU, and therefore non-bindingly commits to reach [net-zero](#) GHG emissions and/or to limit per capita GHG emissions to 2 metric tonnes by 2050.

India contends that "there can be no 'one-size-fits-all' climate change strategy" ([CSAPCC](#), 2014), which calls for specific sub-national State Action Plans for Climate Change (SAPCCs). The Chhattisgarh SAPCC (CSAPCC) focuses on 8 key sectors: Agriculture & Allied Sectors, Forest & Biodiversity, Water Resources, Urban Development, Transport, Energy, Industries & Mining, Human Health. The CSAPCC also has the [specificity of integrating gender](#).

### Energy – Developing and adapting renewables to local context

Despite being [India's most carbonated state economy](#), a shift towards renewables can help Chhattisgarh towards decarbonation, as it is only [at 2.4% of its renewable energy potential](#) (estimated potential: 20,000 MW).

Chhattisgarh's power production to consumption ratio is higher than the average of other states, despite year-on-year increases in demand. However, Chhattisgarh is so densely forested that grid extension is difficult. Unreliable grid electricity becomes a [critical issue](#): 36% of primary health centres report unmet

electrification needs with dramatic consequences on health. The deprivation of adequate electrification acts as an incentive to turn to solar power: as part of its [Solar Energy Policy](#), Chhattisgarh installed 2 kWp off-grid solar PV rooftop systems across 570 PHCs between 2012 and 2016 (CEEW, 2018). In 2016-2017, [159 State Government schools](#) were powered using solar energy.

Through [Solar Cities Master Plans](#), the cities of [Raipur](#) and [Bilaspur aim for](#) a minimum of 10% reduction in the projected demand of conventional energy within 5 years, combining energy efficiency measures and enhancement of renewable energy supply. Chhattisgarh's Government also has to create within 5 years of [2,000 "Suryamitras"](#), skill development programmes for the youth seeking employment in the solar energy sector.

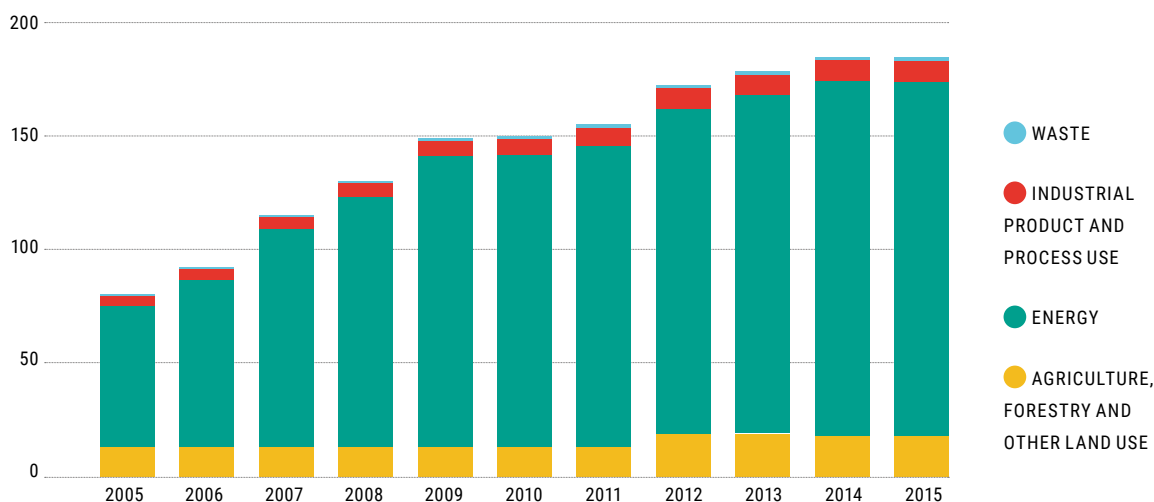
The core of Chhattisgarh's electricity is produced in thermal power plants, which are heavily impacting freshwater resources. The ash and industrial effluents discharged from the plants contaminate water sources, down to the crops: degraded water quality lowers the quality and quantity of rice yield. [To mitigate these impacts](#), Chhattisgarh has mandated power plants to use recycled water, the state is investing in wastewater infrastructure to deliver non-potable water at reduced prices for thermal plant cooling applications, and it decentralizes water treatment for both rural and metropolitan settings.

### Land uses – The loss of carbon sinks

Forests covered [41%](#) of Chhattisgarh's surface in 2017, and have acted as the state's most proficient [carbon sink](#): land has continuously ensured greater emissions absorption than generation until 2011, when numerous hectares of forest land were [opened for mining](#). The [livelihoods of forest dwellers](#) depend on food and income from [non-timber forest produce](#) (NTFP, designating forest products that do not require tree logging), which are increasingly threatened by climate change. [Action on Climate Today \(ACT\)](#), a five-year World Bank initiative, is thus helping these vulnerable populations by creating employment opportunities mostly through conservation activities.

## CHHATTISGARH'S - GHG EMISSIONS (IN MTCO<sub>2</sub>E)

Source: [Economy-wide emissions estimates retrieved from GHG Platform INDIA \(2016\)](#)



### Adaptation – Agroforestry to bundle both mitigation and adaptation

The CSAPCC stipulates that “Adaptation’ will be the predominant [...] climate response strategy of Chhattisgarh”, and focuses on conciliating hard and soft adaptation strategies of ‘[natural infrastructure](#)’ to improve resilience, on ensuring synergies with mitigation, and on “[further \[recognizing\] and \[supporting\] women’s role in adaptation](#)”.

Adaptation in Chhattisgarh is [largely forest-based](#). The strategy is two-fold: adaptation for forests (strengthening forests’ capacity to deal with climate change), and forests for adaptation (using forests to help strengthen resilience to climate change and support livelihoods). [Joint Forest Management](#) oversees 55.52% of Chhattisgarh’s forest area: it works on improving water conservation and management, on bamboo regeneration activities, on sustainable NTFP harvesting, on nursery developments and afforestation, on biodiversity, and on [wetland conservation](#).

ACT’s [technical session](#) on climate resilient agriculture in Chhattisgarh highlighted that “agroforestry systems readily bundle both mitigation and adaptation”. One of its [studies](#) on climate-smart agriculture identified local adaptation strategies: adopting shorter-duration, hybrid varieties to deal with altered seasons, planting or mixing high-yielding varieties with local varieties, and turning to more resilient traditional millet varieties. [Resilience enhancement strategies](#) were adopted by the Chhattisgarh Government, such as weather-based crop insurance schemes, and training on climate-smart agriculture. On average, livestock contributes 55% of total land use emissions and rice cultivation 38%, [the](#)

[second largest emitter](#). Agriculture [provides income](#) to approximately 80% of Chhattisgarh’s rural population. 46% of these farmers depend on [rain-fed mono-crop agriculture](#), a practice that increases vulnerability to the effects of climate change by reducing adaptive capacity. Rice - Chhattisgarh is the “rice bowl of India”, with [19,000 native species](#) - and wheat are expected to undergo significant productivity declines. In 2016, Chhattisgarh launched a [solar community irrigation project](#): the State government targeted to install 51,000 solar pumps to irrigate 50,000 ha of land. These pumps have a 155 MW generation capacity and are 95 to 98% subsidised by the State government.

### Waste – The innovative way of Ambikapur city to collect waste

While in 2015 [none](#) of the State’s waste was treated, there were [84%](#) of the 601,885 million tonnes of annual solid waste processed in 2018, more than any other Indian State. It is also the first Indian State to have introduced [E-rickshaws](#) to collect waste: these have been extremely successful, and have greatly enhanced Raipur’s waste management performance.

Ambikapur has set up a [garbage café](#), where plastic waste collectors receive free meals in exchange for their service. The plastic is then mixed to asphalt and used to build roads. Ambikapur transformed its former 15-acre landfill into a [Sanitation Awareness Park](#) with trees and ponds. [447 women](#) from self-help groups (SHG) engage in daily door-to-door household waste collection – the SHGs also ensure training programmes in SLRM (solid liquid resource management). A tax is raised for managing operations and for the maintenance of the project: houses, shops, hotels, hostels, and ashrams all contribute proportionately to their activity.