

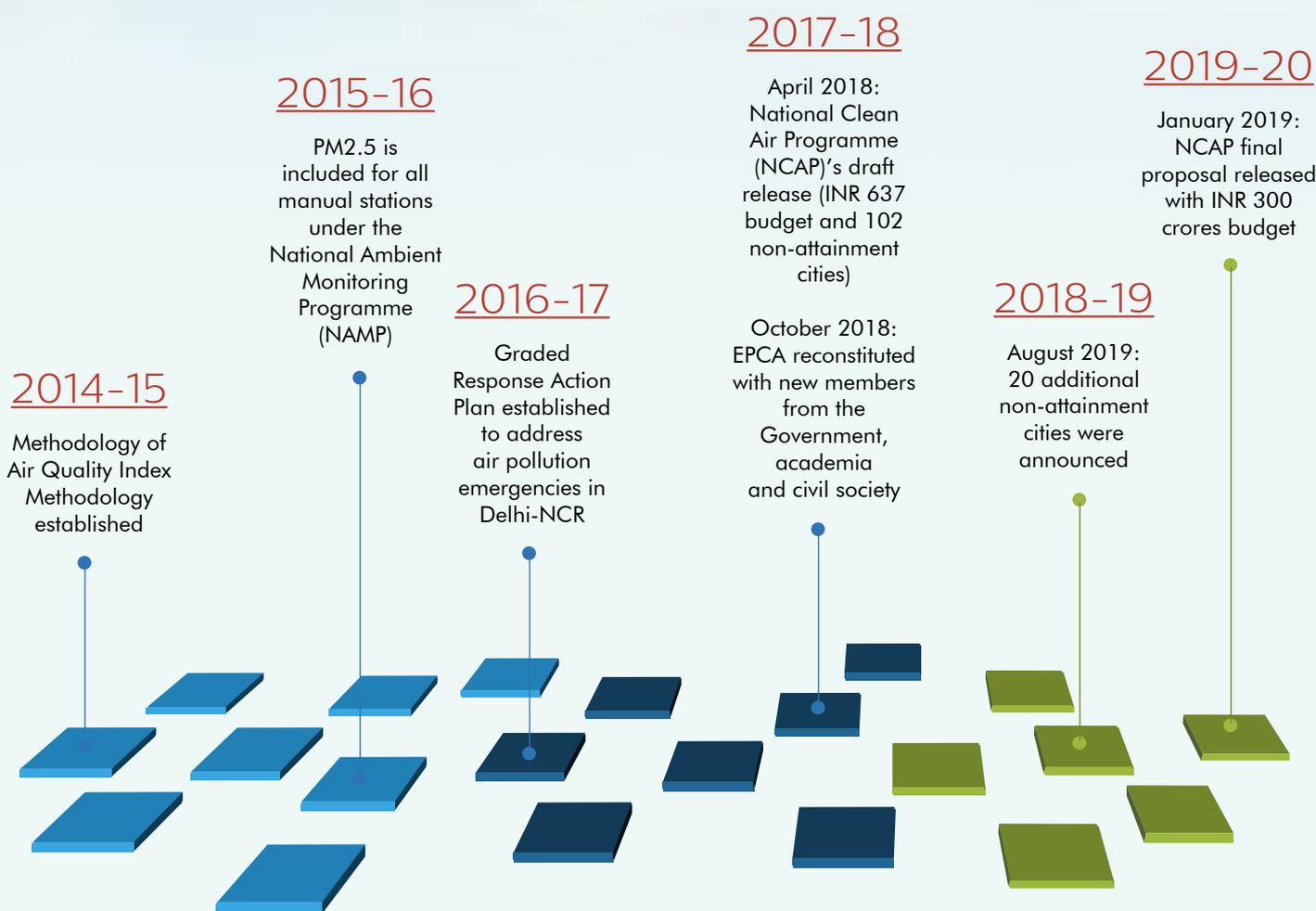
Getting to a Breath of Fresh Air

Air pollution has risen to alarmingly dangerous levels in cities across India. In 2018, a WHO report found that 14 of the world's 15 most polluted cities were in India. One out of every eight deaths in India can be attributed to air pollution, according to study conducted by the Indian Council of Medical Research (ICMR). The problem unfortunately is only worsening. In the winter of 2019, the Delhi-NCR region saw several smoggy days, which led to schools being shut down and restricted people indoors. Many other cities such as Raipur, Mumbai, Patna, Chennai, Kanpur, Varanasi, Agra made headlines because of poor air quality. More and more concerned citizens are highlighting public health risks, particularly for the children and the elderly, and media coverage of the problem has increased significantly.

Recognizing the urgency and complexity of this challenge, the Ministry of Environment, Forests and Climate Change (MoEFCC) released the National Clean Air Programme

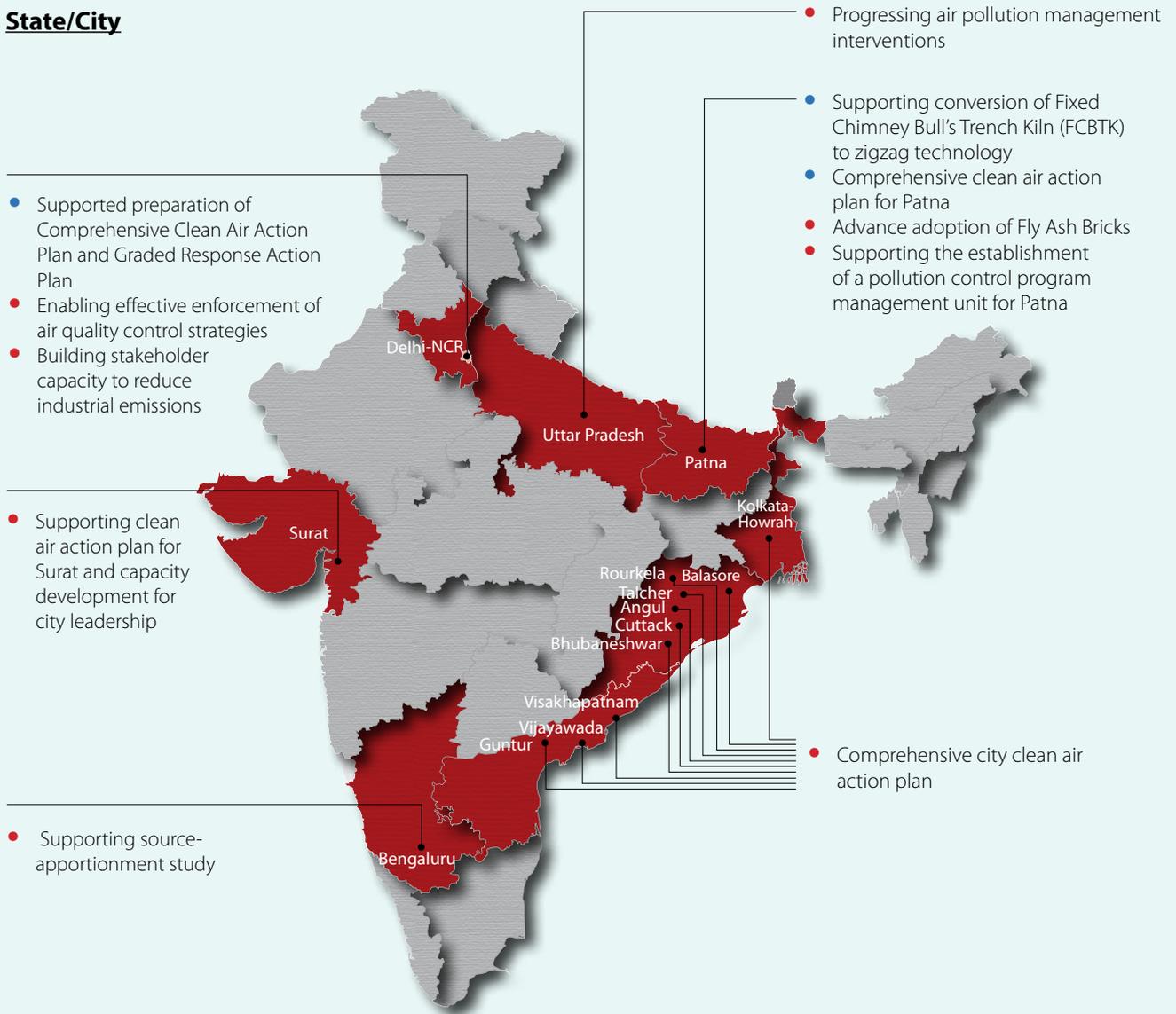
(NCAP) in January 2019. The NCAP aims to reduce PM2.5 and PM10 concentrations by 20-30% by 2024 against a 2017 baseline. It identifies 122 non-attainment cities, which are required to submit clean air action plans. It also aims to expand the national air quality monitoring network, build capacity for air pollution management and strengthen public awareness. While some progress has been made since the plan was launched, efforts to tackle air pollution must be scaled up significantly in the face of ever-increasing vehicular emissions, large-scale open burning of waste and agricultural residue, construction, and industrial activity.

At Shakti Sustainable Energy Foundation, we believe in a future where everyone can breathe clean air. Since 2014, we have supported strategic interventions to improve air quality management in India starting with making the brick sector cleaner, and over the last two years, advanced to air quality monitoring, assessment of mitigation options, evidence-based research, stakeholder capacity building and outreach.



Our Air Quality Portfolio

State/City



National

- National Knowledge Network under the National Clean Air Programme
- Establishing low-cost air quality monitors in 50 Indian cities to provide real-time air quality data
- Assessing the health effects of exposure to air pollution
- Developing financing mechanisms to control air pollution
- Guiding framework and toolkits for clean air action plans
- Stakeholder capacity building and advocacy to reduce emissions from road transport
- Building strategy for end-of-life regulation and scrappage of old vehicles to maximize emissions benefits
- Air Pollution Knowledge Assessment (APnA) city program
- Pathways to achieving National Ambient Air Quality Standards (NAAQS) through air quality models
- Benefit-Cost Analysis of Proposed Emission Standards for Coal-Based Power Plants
- Supporting effective implementation of India's environmental laws for controlling air pollution

•	Projects completed
•	New/Ongoing projects

Making air quality data robust and accessible

Low-cost air quality sensors provide real time PM 2.5 data

Lack of reliable air quality data can hinder the design and implementation of interventions to improve air quality in Indian cities. While most metropolises have facilities to track this data, many smaller cities do not house even a single air quality monitor. The National Clean Air Programme envisages a much larger monitoring network in 2024.

In order to facilitate these efforts, we are prioritizing interventions that increase the availability of air quality data to make it easily accessible for all. In this respect, we supported the establishment of two independent low-cost ambient air quality monitoring networks in India- Respirer Living Sciences Private Limited and Skymet Weather Services Private Limited. Together both networks constitute 250 low-cost air quality monitors in 50 Indian cities.

Data from these monitors is being tracked and used in several ways:

- In Jaipur and Raipur, the sensors are being used by Doctors for Clean Air and the State Health Resource Centre respectively to disseminate health advisories to citizens.
- Skymet's AQ mobile application saw 20,000+ downloads during the first month of its' launch.

- Owing to the response from the 250-sensor network, cities like Delhi, Gurugram, Chennai, Mumbai Metropolitan Area have shown an interest in strengthening their air quality monitoring through a denser network of low-cost sensors.
- Key research organizations like IITs in Kanpur, Mumbai and Delhi, now champion the use of low-cost sensor networks. Their laboratories have procured, tested and deployed these sensors for research and analysis.

50 Indian cities get air pollution baselines and projected trends

The Air Pollution Knowledge Assessment (APnA) city program generated the first of its kind air pollution baselines, sources and projected trends for 50 cities using a scientific air quality modelling approach—an important starting point for city governments and stakeholders to chart out strategies for better air quality. Many of these 50 cities saw their air pollution profiles for the first time. The city-wise reports informed the development of the National Clean Air Programme (NCAP).

In fact, Patna was the first city to immediately sanction five additional monitoring stations for the city based on the recommendations of the APnA report. The city even went ahead to develop and adopt a robust and scientific action plan based on the APnA assessment. Scaling these efforts, cities like Patna, Gaya, and Muzaffarpur are now undertaking their detailed source apportionment studies.

National Clean Air Programme (NCAP) rollout

Efforts by us contributed to the development of the Comprehensive Action Plan and Graded Response Action Plan (GRAP) for the Delhi-NCR region. Recommendations and research while developing these two critical plans also helped to inform the development of the National Clean Air Programme.

We are engaging with policymakers and other key stakeholders in the implementation of the NCAP. We are supporting our grantees to provide technical assistance to over 15 cities to develop clean air action plans. In nine cities where plans have already been developed, we are enabling the city administrations to implement source-specific pollution control measures. Additionally, we are also helping to strengthen the knowledge base of cities through source-apportionment studies and techno-economic analysis that can help identify the most feasible control measures for a city.

An important outcome of our effort is the adoption of a comprehensive and scientific Patna Clean Air Action Plan.



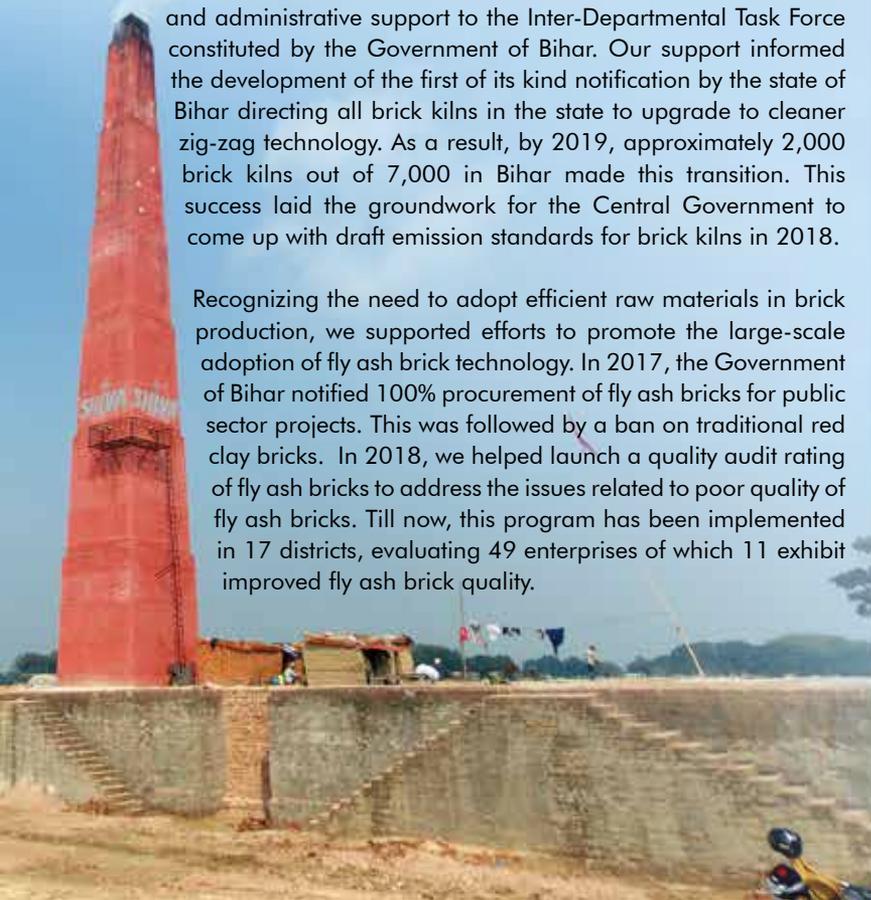
Launched by the Deputy Chief Minister of Bihar, Shri Sushil Kumar Modi, in November 2019, the plan is both timely and relevant for Patna, one of the five most polluted cities in the world. The plan suggests that by 2030, the city has the potential to cut down emissions by 69% (taking 2018 as the base year). We are now supporting the establishment of a pollution control program management unit (PMU) in Bihar, under the aegis of Bihar State Pollution Control Board (BSPCB).

Towards a cleaner and more efficient brick sector

India is the second-largest brick producer in the world. The brick sector is continuously expanding on account of the increased demand for bricks in infrastructure and housing. But it is also a significant source of GHG and black carbon emissions in India. This is why we are investing in multi-year efforts to transition to cleaner brick-manufacturing technologies, with a geographic focus on Bihar and NCR.

Over the years, our grantees have provided technical assistance and administrative support to the Inter-Departmental Task Force constituted by the Government of Bihar. Our support informed the development of the first of its kind notification by the state of Bihar directing all brick kilns in the state to upgrade to cleaner zig-zag technology. As a result, by 2019, approximately 2,000 brick kilns out of 7,000 in Bihar made this transition. This success laid the groundwork for the Central Government to come up with draft emission standards for brick kilns in 2018.

Recognizing the need to adopt efficient raw materials in brick production, we supported efforts to promote the large-scale adoption of fly ash brick technology. In 2017, the Government of Bihar notified 100% procurement of fly ash bricks for public sector projects. This was followed by a ban on traditional red clay bricks. In 2018, we helped launch a quality audit rating of fly ash bricks to address the issues related to poor quality of fly ash bricks. Till now, this program has been implemented in 17 districts, evaluating 49 enterprises of which 11 exhibit improved fly ash brick quality.



Reducing emissions from road transport

Emissions from the transport sector are a major cause of worsening air quality in cities. Research and policy solutions supported by us helped to inform India's landmark decision to leapfrog to BS-VI norms for vehicles and fuels April 2020 onwards, skipping BS-V altogether. This is expected to reduce on-road emissions significantly. To further BS-VI readiness, we supported an assessment of India's regulatory preparedness to implement BS-VI emissions standards. We also supported the development of policy solutions for states to reduce emissions from existing heavy-duty vehicles (HDVs) and supported capacity building of state regulators in order to enable greener road-based freight. Now, BS-VI fuel is being supplied to cities, and real-world emission tests will commence to check that diesel vehicles do not arbitrarily exceed emission limits. We are currently supporting efforts to strengthen city-based in-use emissions management system, which will help monitor the performance of the advanced emissions control system.



Shakti Sustainable Energy Foundation (Shakti) seeks to facilitate India's transition to a sustainable energy future by aiding the design and implementation of policies in the following areas: clean power, energy efficiency, sustainable urban transport, climate change mitigation and clean energy finance.

W : www.shaktifoundation.in

Corporate Identity Number : U93030DL2009NPL194891



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