

## **Briefing Note**

# **Dirty air: What awaits the next decade?**

December 20, 2019

**Delhi's experience shows regions need a near-zero emissions roadmap and zero tolerance for non-compliance. While strengthening local action can scale up regional solutions, we need a 'good neighbour' policy for ensuring massive cuts in pollution across all regions.**

As this decade comes to an end, it becomes necessary to take stock of what has happened so far to control air pollution, to understand the future agenda in India.

Delhi is fighting one of the oldest air pollution battles in the country. It has thrown up many lessons that cities and regions implementing clean air action plans must take note of to confront their new generation challenges. In view of the steep reduction targets needed across all regions, the next decade will require more disruptive changes.

### **The lessons from Delhi**

**Even after stabilisation and decline in air pollution levels, Delhi will have to prepare for another 65 to 70 per cent cut in the coming decade.** During the current decade, trends in PM<sub>2.5</sub> have stabilised and the curve has bent. The analysis of indicative trends based on granular real-time data (and based on global methods for trend analysis and data completeness) shows that even after a drop of a quarter, another 65 to 70 per cent reduction is needed from the current baseline (three year average of 2016-18) to meet the annual average standards.

Delhi has already shut all coal power plants, moved to natural gas in both industry and transport, controlled truck numbers, introduced cleaner emissions standards, and allows only approved clean fuels in all sectors. Now imagine what more would need to be done for the next big cut of over 65 per cent!

**Action in this decade has not been small; but it is not enough – the question is, how much more disruptive would the next decade need to be?** There has been unparalleled multi-sector action in Delhi. In the industry and power sectors, all coal-based power plants have been closed down; a large part of legal industrial units have moved to natural gas. An approved fuel list has been notified, and the Supreme Court has supported it by banning coal, petcoke, furnace oil and all other dirty fuels. In the vehicle sector, the daily entry of trucks into Delhi has declined drastically due to imposition of and cashless payment of environment compensation charge, restriction on 10-year-old trucks, and diversion of trucks through the two peripheral expressways. Substantial fleet renewal has happened, based on the new BS-IV emissions standards. Dieselisation of the car fleet has reduced due to the ban on 10-year-old diesel vehicles and imposition of environment pollution charge on big diesel cars and SUVs. BS-VI fuel has been introduced. Nearly all commercial vehicles have moved to CNG and older vehicles are being phased out. Metro ridership has increased. In the waste management sector, recycling of construction and demolition waste has begun.

None of these measures are small and none of these were easy to implement. All of them were strongly contested in the Supreme Court, and this delayed their implementation. As a result, the city has lost precious time. The city cannot spend another decade contesting and delaying solutions.

Areas where action has been slowest include city-wide mobility and transportation strategies to control vehicle numbers, controlling pollution from small- and medium-scale industrial units including informal recycling units, and waste and dust management– municipal solid waste, construction and demolition waste and plastic waste. Setting the future agenda and building public and political support for harder decisions is critical now.

**As annual levels remain elevated, winter still experiences severe smog episodes.** Daily data analysis has shown that the

overall number of cleaner days during the year has increased in Delhi and across seasons, and are predictably more during summer and monsoon. Analysis of daily trends shows that the number of days meeting the standards has increased by about 50 per cent since 2016; the number of 'severe' category days has remained constant; while the number of 'very poor' days has reduced.

There is a pattern in the winter smog -- winters in the last four years show a variable pattern of prolonged to scattered smog episodes. The analysis of daily data for consecutive winters (2016-19) shows that 'bad' days are setting in late and clearing up earlier. But when the smog episodes occur, they build up to 'very severe' levels. Changing weather conditions, inversion, lack of winds and western disturbances -- among other things -- exert a serious impact. Delhi and the NCR area show synchronised and identical smog trends during winters: the regional build-up is quite uniform. When the pollution gets trapped, emergency action becomes necessary.

**Smog episodes across the Indo-Gangetic plain bring out the regional challenge.** During smog episodes in winter, the smog builds up and shifts rapidly through the Indo-Gangetic plains. It shows that towns like Bhatinda, Ludhiana, Jind, Rohtak, Meerut etc -- which have much lower levels of annual PM<sub>2.5</sub> than Delhi -- experience severe episodes during winter. This also explains why Delhi, despite stabilisation and lowering of pollution, experiences bad smog episodes. In the cities of Punjab, smog episodes coincide with the crop burning period. Patna, Gaya, Varanasi, Lucknow and Kanpur indicate prolonged periods of 'very poor' and 'severe' conditions from November to January. Rajasthan cities -- Jaipur, Alwar, Ajmer etc -- experience relatively lesser 'severe' episodes; their levels go high during the crop burning season. In Kolkata and Howrah -- which lie at the end of the Indo-Gangetic plain -- December and January are the problem months. In the Mumbai region as well, winter is more polluted than the summer, with November being the problem month. As much as 60 per cent of the 122 non-attainment cities are in the Indo-Gangetic plain.

**A city cannot solve the problem on its own -- a regional airshed approach is needed.** Majority of the non-attainment cities are very small; 70 per cent of them have population less than 10 lakh or a million. While the list of non-attainment cities includes mega cities like Delhi, Kolkata, Mumbai and Bengaluru, there are a large number

of smaller urban centres with less than 5 lakh population. Local action can certainly reduce local exposure. But if the larger influence area of these small towns within the airshed is neglected, local pollution can remain obstinate and the larger region will also not clean up. Examples of such small cities include Anpara (less than 18,000 people), Gajraula (about 55,045), and Rae Bareilly (about 1.9 lakh) – all in Uttar Pradesh – and Gaya and Muzaffarpur in Bihar (both less than 5 lakh). While reducing local exposure is important, scalable action in the airshed also becomes necessary for overall improvement in air quality.

But airshed is a vast mix of multiple state jurisdictions and governance systems. There is no clear mechanism for creating a common framework of action, monitoring and compliance for coordinated and harmonised measures undertaken across multiple jurisdictions across states. All non-attainment cities have started to implement their action plans. It is important to intervene at this early stage to create the framework for integrated regional action.

**A regional approach is a MUST.** The NCAP notification of January 10, 2019, has acknowledged the importance of taking a regional approach. It states that the regional and trans-boundary plan has a major role to play in effective control of pollution, more specifically with reference to the Indo-Gangetic plain. Various measures need to be stressed on through regional level inter-state coordination, specifically for the Indo-Gangetic plain:

- In transport, implementation of policies such as the Auto Fuel Policy for stringent norms for fuels and vehicles, road-to-rail/waterways movement, fleet modernisation, electric vehicle policies, clean fuels, construction of by-passes, taxation measures, etc
- In industry, stringent industrial standards, clean fuels, clean technology and enforcement (continuous monitoring)
- In biomass management, enhanced LPG penetration, and controlling agricultural waste burning and management.

A comprehensive regional plan, incorporating inputs from regional source apportionment studies, should be formulated.

Controlling pollution only in a small municipality will not help clean up the region. This will require a different strategy for scaling up action across different airsheds. Since 2015, explicit efforts have been made to expand the scope of all Supreme Court directives and plans

to include the entire NCR, but the implementation has not been uniform in terms of scale and stringency of action.

A clear legal mechanism is needed to initiate such an approach. Technically, there is no legal hurdle to introducing this approach. Under the Air (Prevention and Control) Act, 1981, Article 19 confers power to declare air pollution control areas. Under this provision, areas – largely industrial – are declared ‘critically polluted’. The scope and ambit of this Act can be broadened to include more jurisdictions for integrated planning and compliance.

**Multi-sector action is underway in all regions, but it needs to be strengthened for scale and compliance.** While national norms and regulations for the concerned sectors – industry, power, vehicle and transportation and waste -- are the common minimum requirements across the country, there is evidence of more progressive action in several cities and states. In West Bengal, Kolkata has given incentives to replace coal boilers in small and medium industries after tightening the emissions standards by eight times. It has already introduced remote sensing measurement of on-road emissions and has the largest operating electric bus fleet and parking restraints even in residential areas. It is now distributing free LPG to replace solid fuel based stoves in open eateries. Bhubaneswar, in Odisha, has significantly revamped and modernised its bus transport and scaled up infrastructure for non-motorised transport. Industries in Bhiwadi and Alwar in Rajasthan are changing boilers to use agro-waste. Bihar has seen impressive conversion of kiln technology in brick kilns. Punjab has adopted a parking policy as a demand management measure. Several cities are phasing out old vehicles.

Regions, while implementing national policies and regulations, need to go beyond to take more stringent steps.

### **Learning from others**

Globally, governments are seeking answers to this challenge.

#### ***China***

- Has adopted unified planning, monitoring and alerting systems, and unified standards in multiple contiguous regions. Combined the work plans for Beijing City, Tianjin City, Hebei Province, Shanxi Province, Shandong Province and Henan Province.

- Targets "2+26" cities to decrease average PM2.5 concentrations and the number of heavy-pollution days by more than 15 per cent from the previous year.
- Has revised the emergency response plan to unify the alerts and grading for heavy air pollution.
- Has combined the monitoring and inspection system. The Beijing Environmental Protection Inspection team is responsible for 15 provinces.
- Has introduced mutually agreed action plans to reduce coal consumption, manage area sources and adjust the industrial structure.
- Ensures that compliance to the Action Plan is enforced across the region.
- Has reformed vertical management and accountability systems for monitoring, inspection and law enforcement of the environmental protection agencies.

### ***United States***

- Under its Clean Air Act, has provisions to reduce long-range transport of pollution
- Each state's implementation plan is expected to prevent emissions from sources within its borders from contributing significantly to air pollution problems 'downwind'. If a state fails to develop the necessary plan to address this downwind pollution, the US EPA can enforce the federal plan.
- Has instituted 'good neighbour' provisions that include denotifying downwind air quality problems; identifying upwind states that contribute enough to those downwind air quality problems for further review and analysis; and identifying emissions reduction necessary to prevent contributing significantly to downwind air quality problems. States have to take additional steps to satisfy the good neighbour provisions or prove why additional measures are not necessary.
- Monitors air quality at the air basin level.

### ***Europe***

- European Union member states work together to control international air pollution under the Convention on Long Range Transboundary Pollution (the Air Convention).

- Have begun to explore regulatory avenues for building regional action across different jurisdictions.

Given the magnitude of the regional air pollution crisis in India, the time has come for a framework of regional cooperation and obligation based on a mutually agreed action plan, including targets with adequate resource support.

## **Prepare for the next decade**

### **Need zero emissions and zero tolerance roadmap**

- **Delhi and NCR must prepare for third generation action** – Scale of the multi-sector plan should be implemented with stringent compliance, deterrence and incentives for change.

### **Need integrated planning for all regions and airsheds – where are the gaps**

#### **Clean fuels and technology transition:**

- Areas of special concern: small and medium units; fugitive emissions from industrial processes and material handling etc; effective stack monitoring for enforcement

#### **Mobility transition**

- Need a template for the scale of change in public transport services and non-motorised transport in big and small towns
- Vehicle restraint measures

#### **Paradigm shift in waste management**

- Enormous infrastructure deficit for controlling waste
- Municipal rules weak on decentralised segregation, recycle and reuse

### **Need scale, effectiveness and accountability**

### **Need awareness to build support for difficult solutions**