

Hardlook: Smoke & Mirrors | The grey reality of Delhi's long- running experiment with green crackers

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🕒 13 min read



As the festive season peaks, so are the concerns over firecracker emissions that contribute to making the Capital's air unbreathable for many every year (Express File/Praveen Khanna)

Ten days ahead of Diwali, the Supreme Court on Friday **indicated that it may relax the total ban on firecrackers** in Delhi-NCR “on a trial basis” and take steps to “balance out” the interests of various stakeholders in the same way that Arjun Gopal, the court’s 2018 judgment

that put significant restrictions on the use of firecrackers and allowed only low-emission 'green crackers', had done.

As the festive season peaks, so are the concerns over firecracker emissions that contribute to making the Capital's air unbreathable for many every year. What began in 2015 as a plea in the top court by three infants seeking protection from the harmful effects of air pollution in Delhi is now a decade-old, continuing legal battle over the fundamental right to breathe clean air.

Despite repeated judicial interventions, the enforcement of the restrictions on firecrackers has remained patchy and ineffective. Ahead of Friday's hearing, the Delhi government told the SC that "despite restrictions, violations continued, which led to the use of highly polluting firecrackers and worsened Delhi's air quality."

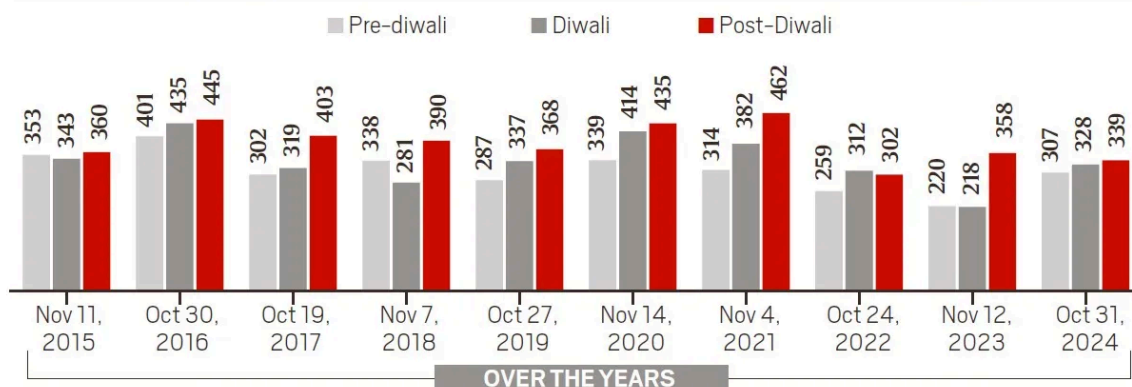
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Chief Minister [Rekha Gupta](#) had said earlier that "keeping in mind the sentiments of crores of people", the government would like the court to allow the use of certified green firecrackers during Diwali.

From 2015 to 2025

The SC ruled on the 2015 petition in October 2018 (see timeline), prohibiting the manufacture and sale of conventional firecrackers, and allowing only reduced-emission or "green" variants developed by the Council of Scientific and Industrial Research (CSIR). Time windows were fixed for burning crackers.

AVERAGE AQI ON PRE-DIWALI, DIWALI AND POST-DIWALI DAYS



Source: Central Pollution Control Board

In November 2020, the National Green Tribunal (NGT) put an “absolute” ban on all kinds of firecrackers during the Diwali period in the NCR, and in other highly polluted towns and cities.

Since then, the Delhi Pollution Control Committee (DPCC) has issued notifications banning the sale and bursting of firecrackers for the last months of every year. Last winter, following a nudge by the SC, a year-round ban was imposed.

In April this year, the SC said that a ban for a few weeks around Diwali would not make any difference, and no relaxation could be allowed for green crackers unless it could be established that they have a significant impact.

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On September 26, while hearing applications seeking modification of this full-ban order, the court allowed licensed and certified manufacturers to make green crackers on the condition that they are not sold in Delhi-NCR “until further orders”.

Idea of ‘green’ crackers

In the context of the SC's 2018 order, CSIR was asked to devise, through its National Environmental Engineering Research Institute (NEERI), formulations for less-polluting green crackers.

The performance and safety standards of the ‘green’ crackers are vetted by the Petroleum and Explosives Safety Organisation (PESO) under the Union Commerce Ministry before being cleared for public use.

Green crackers are designed to cut emissions of particulate matter and harmful gases by about 30-40% while keeping noise levels below 120 decibels (See box).

However, Dr Rajeev Kumar Mishra, a senior researcher at Delhi Technological University, pointed to a 2022 joint study with IIT Roorkee, which found that even green crackers released large volumes of ultrafine particles — smaller than 100 nanometres — that can penetrate deep into the lungs.

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“More research is needed to assess atmospheric emissions of green crackers and their health impacts to evaluate whether they are better or worse than traditional crackers,” Mishra said.

In recent years, the debate has taken on a political colour as some leaders have sought to paint the criticism of firecrackers as being against Hindu traditions. Delhi Minister Kapil Mishra has previously opposed restrictions on firecrackers as “unscientific” and “illogical”.

Difficult to enforce

The SC observed last month that “As has been experienced, despite the imposition of a complete ban, the same could not be effectively implemented.”

Indeed, the storage and sale of firecrackers have allegedly continued unabated in the city. Earlier this month, the Delhi Police Crime Branch seized 1,645 kg of banned fireworks during raids in Dwarka, Rohini, Uttam Nagar, Shastri Nagar, and Mukundpur, and arrested six people.

According to Deputy Commissioner of Police (Crime Branch) Pankaj Kumar, the stock, which was traced to Murthal and Sonapat in Haryana, was found stored in residential buildings, grocery shops, and a small LED-bulb unit in unsafe conditions.

Over the years meanwhile, air-quality data have shown sharp pollution spikes on and immediately after Diwali. According to records of the Central Pollution Control Board (CPCB), the 24-hour average Air Quality Index (AQI) on Diwali has rarely fallen below the “very poor” category since 2016 (See chart).

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Young children bear the brunt of the air pollution. Their lungs and brains are still developing, and their immune systems are weaker than those of adults, which increases the risk of respiratory infection and reduces their ability to fight it, paediatricians say.

A study published in The Lancet Planetary Health in July 2024 found that between 2008 and 2019, approximately 33,000 deaths each year in 10 Indian cities could be linked to short-term exposure to PM2.5. Delhi topped this list, with an estimated 12,000 pollution-related deaths annually. This is ironic because, according to the Directorate of Education, schools in the capital were among the first to launch a campaign against firecrackers back in 2010.

“The question is, who will ensure that a cracker is genuinely green, and in compliance with NEERI and PESO norms?” said environmental activist Bhavreen Khandari. “Once licences for production are granted, it becomes nearly impossible to control what actually enters the market,” she said.

Enforcement agencies are understaffed and overstretched, and will find it difficult to monitor compliance if green crackers are permitted. “The last time these were allowed, there was no way to verify what was being sold in markets. Allowing green crackers will only create confusion,” Khandari said.

Question of livelihoods

The potential impact of a total ban on families dependent on the firecrackers trade has been flagged repeatedly in courts.

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According to official estimates, India's firecracker industry was worth more than Rs 4,800 crore in 2022, and employed more than 9 lakh people. Rajiv Kumar Jain, president of the Fireworks' Manufacturers Association (North India), said the blanket ban has hurt thousands of workers.

“The prohibition on manufacturing and sale has pushed an entire community out of work... We are thankful to the court for allowing manufacturing in NCR,” Jain said.

However, none of the NCR manufacturers would be able to actually function this Diwali as the renewal of their licences could take around six months, he said.

Limited public support

In neighbourhoods across the city, residents have been stocking up on Diwali crackers. A 35-year-old resident of Najafgarh who gave his name as Rakesh said he goes to buy firecrackers from Bahadurgarh or Rohtak in Haryana. “Apne bachche ke liye (It's for my child),” he said.

In Sadar Bazar, Jyoti, principal of a Government Girls Senior Secondary School, said her students had started bursting crackers even before Dussehra. “We can stop them inside the school, but who can control them outside? Even their parents are not convinced [about not using crackers].”

Ajay Veer Yadav, president of the Government School Teachers' Association, said there should be no restrictions on "celebrations". "We burst crackers when India wins in cricket. The act itself is linked to joy," he said.

Senior Advocate Amit Bhandari, the father of one of the three infant petitioners of 2015, said, "The will of the people and the will of the government both are missing."

A DECADE OF ARGUMENTS

Sept 2015: Arjun Gopal, Aarvan Bhandari, and Zoya Rao Bhasin, aged 6-14 months, move Supreme Court seeking ban on firecrackers.

Nov 2016: Delhi Pollution Control Committee (DPCC) issues direction to ban firecrackers except on religious occasions.

July 2017: SC bans use of five chemicals — antimony, lithium, mercury, arsenic, and lead in firecrackers.

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Oct 23, 2018: SC bans production and sale of firecrackers other than "reduced emission (improved crackers) and green crackers".

Oct 30, 2018: SC clarifies that the direction on green crackers is limited to the National Capital Territory (NCT) region.

Nov 5, 2020: NGT directs a total ban on sale and use of all kinds of firecrackers in NCR from November 10-30, 2020.

2018-2020: Window for bursting firecrackers limited to two hours.

Sept 28, 2021: DPCC orders "complete ban on bursting and sale of all kinds of fire crackers up to 01.01.2022 in NCT of Delhi".

Oct 29, 2021: SC reiterates its Oct 2018 order. Says "there is no total ban on use of firecrackers", and "only those firecrackers are banned...which are found to be injurious to health".

Nov 1, 2021: SC sets aside Calcutta High Court order imposing a total ban on use of firecrackers during festivals such as Diwali, Chhath, [Christmas](#) Eve and New Year's Eve.

Oct 2022: SC refuses to lift ban after urgent plea moved by [BJP MP Manoj Tiwari](#).

Oct 6, 2023: DPCC orders “complete ban on all kinds of firecrackers on manufacturing, storage, selling (including delivery through online platforms) and bursting of all kinds of firecrackers up to 01.01.2024 in NCT of Delhi”.

Nov 7, 2023: SC clarifies that ban on use of barium and banned chemicals in firecrackers are applicable to the entire country.

Oct 14, 2024: DPCC orders total ban up to January 1, 2025.

Nov 11, 2024: SC asks Delhi govt to decide on extending ban on firecrackers throughout the year.

Also Read | Firecrackers worth over Rs 6.25 crore seized in raids in Ghaziabad; 3 arrested

Dec 19, 2024: Delhi govt informs SC that it has imposed total ban in the NCT throughout the year.

April 3, 2025: SC declines to relax the ban on manufacture, storage and sale of firecrackers in Delhi-NCR; says a ban for a few weeks around Diwali won't make any difference as crackers could be bought in advance.

Sept 12, 2025: Chief Justice of India B R Gavai remarks that people of Delhi-NCR are not “elite citizens” who alone were “entitled to pollution-free air”, and that “if firecrackers are going to be banned, let them be banned throughout the country”.

Sept 26, 2025: Hearing pleas by manufacturers seeking modification of the April 3 order that put a complete ban on manufacture, storage, sale and use of all firecrackers in Delhi-NCR, SC asks Centre to come up with a “concrete proposal” to ensure that markets have only green crackers.

Oct 10, 2025: SC reserves order after Centre urges it to permit firecrackers on festivals, including Diwali.

GREEN LIGHT TO CRACKERS

CONVENTIONAL FIRECRACKERS: Heat travels along fuse to bottom of ‘shell’ (often a sphere of hard paper), which is packed tightly with black powder, a low explosive made of potassium

nitrate (saltpetre), sulphur, and charcoal. On igniting, black powder releases hot gases and energy that force the shell out of its tube ('mortar'). Shell contains pellets of chemical salts known as 'stars'; the types and quantities of which determine sound and light effects of the firecracker. For example, strontium, magnesium and barium salts produce red, white and green colours respectively; potassium chlorate produces louder sound, and bismuth a crackling or popping sound.

GREEN CRACKERS, also called 'improved' or 'new formulation' fireworks, do not contain harmful chemicals and are supposed to be less harmful and produce less air pollution.

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Shells are smaller, use lesser amounts of raw materials and additives such as dust suppressants to reduce emissions, and do not produce ash (like in 'snake' firecrackers). There is a minimum PM reduction of 30%, but questions have been asked about this claim.

NOVEL FEATURES include matching performance in sound (100-120 dBA) with commercial crackers while overcoming issues of particulate and gaseous emissions; PM reduction of >80% for peroxide-based crackers and 30% for water-based crackers; significant NOx and SOx reduction; and reduced costs because saltpetre and sulphur is not used.

CERTIFICATION is by CSIR-National Environmental Engineering Research Institute (NEERI), which issues emissions certificates after testing samples provided by manufacturers, after which Petroleum and Explosives Safety Organisation (PESO) issues final approval.

IDENTIFYING green crackers: Circular green or yellow logo saying 'Green Fireworks' and 'CSIR-NEERI', licence certificate, QR code on packaging.

SHADES OF GREEN

SAFAL (Safe Minimal Aluminium Cracker)

MINIMISES use of aluminium, particulate matter, SO2 and NOx emissions.

KNOW-HOW based on concept of exploiting exothermic heat of sorption. CRACKER USP: Unique property of releasing water and/or air as dust suppressant and diluent for gaseous emissions.

STAR (Safe Thermite Cracker)

MINIMISES particulate matter, SO₂, NO_x emissions using thermite-type reactions, in which a metal oxide is oxidiser and metal (aluminium) the fuel.

KNOW-HOW based on improved pyrotechnic composition (thermite) of metal oxide and metal as fuel, which on ignition undergoes exothermic redox reaction.

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CRACKER USP: Light and sound cracker with high luminous intensity; releases negative ion generator.

SWAS (Safe Water Release)

MINIMISES particulate matter, SO₂, NO_x emissions.

KNOW-HOW: Has immobilised water in materials/ additives (hydrogel, calcium peroxide) to react with lime and/ unreacted Al.

CRACKER USP: Additives release water/air and dust suppressant.

ALSO, Green Flower Pots (STAR-Z & STAR-F), and Green Sparklers (BM-Sparklers, BZ-Sparklers, SZ-Sparklers)

Source: CSIR-NEERI

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