



CHAKR INNOVATION

REVOLUTION THROUGH POLLUTION



Air Pollution poses a grave threat

Threat of air pollution is a real and grave issue...

- **4th leading** cause of death globally
- Causes **3 million** deaths per year
- **88%** of these deaths occur in developing nations

... and PM 10, PM 2.5 are the key culprits of ambient air pollution

PM10 and PM2.5 responsible for **major health & Environment Impact**

Respiratory diseases incl. Asthma and Chronic Obstructive Pulmonary Disease

Cardiovascular diseases incl. Stroke and Ischemic Heart Disease

Cancer PM2.5 from diesel exhaust is a Class I carcinogen (WHO)



Diesel Generator: A major contributor to PM2.5 in metropolitan cities

~**16%** of PM2.5 in the Delhi NCR comes from Diesel Generators

~**25%** of PM2.5 in Bangalore is from Diesel Generators

~**9%** of PM2.5 in Chennai is from Diesel Generators



Indian Government has mandated the use of Retrofit emission control technologies and Dual Fuel Kits for DG sets

National Green Tribunal Order dated
6th Aug 2019 O.A. No. 681/2018

20. We note that the air pollution caused by DG Sets needs to be part of the action plans which may, if necessary, require retrofitting of emission-control devices on generators already in use. CPCB may consider this aspect. The NCAP itself provides following action points:

1. Introduction of gaseous fuels and enforcement of new and stringent SO₂- NO_x / PM_{2.5} standards for industries using solid fuels.
2. Stricter enforcement of standards in large industries through continuous monitoring.
3. Full enforcement of zig-zag brick technology in brick kilns.
4. Elimination of DG set usage by provision of 24x7 electricity.
5. Control by innovative end of pipe control technologies.
6. Evolve standards and norms for in-use DG sets below 800 KW category.
7. For DG Sets already operational, ensure usage of either of the two options: (a) use of retrofitted emission control equipment having a minimum specified PM capturing efficiency of at least 70%, type approved by one of the 5 CPCB recognized labs; or (b) shifting to gas-based generators by employing new gas-based generators or retrofitting the existing DG sets for partial gas usage.
8. Utilize the Gujarat case study for a compelling case for other states to adopt third-party audits for polluting industries for enhancing implementation(States)."

Thus, DG Sets should also be covered by the action plans for all the States/UTs.

Commission for Air Quality (CAQM)
directions for DG sets in Delhi NCR

Direction No 54

**COMMISSION FOR AIR QUALITY MANAGEMENT
IN NATIONAL CAPITAL REGION AND ADJOINING AREAS**
17th Floor, Jawahar Vyapar Bhawan (STC Building)
Tolstoy Marg, New Delhi-110001

F. No. A-110018/01/2021-CAQM/CS81-6585 Dated: 08 February, 2022

Subject: Directions under Section 12 of the Commission for Air Quality Management in National Capital Region and Adjoining Areas Act, 2021 for effective control of air pollution in Delhi-NCR – Regulations for use of Power Generating Sets.

II. The Commission further directs that for other sectors and services, selective use of alternate power (other than electricity supply through DISCOMS) through generating sets would be permitted / regulated, even for the period of ban under the GRAP, as detailed below:-

- (a) Generator sets running purely on LPG / Natural Gas / Biogas/Propane/Butane: – There shall be no restrictions on running such generator sets.
- (b) In industrial areas where gas infrastructure and supply is available, Generator sets shall be permitted to operate for a maximum of 2 hours on a per day basis, to take care of exigencies of power supply failures etc. provided that:
 - (i) The Diesel Generator Sets have been suitably converted to run in a hybrid/ dual fuel mode (with 70% gas-based fuels and 30% Diesel)

and

 - (ii) Such Diesel Generator Sets are also equipped with Retrofitted Emission Controlled Devices (RECD) in accordance with the CPCB guidelines towards a minimum PM capturing efficiency of 70% for in-use DG sets up to 800 KW gross power category, issued pursuant to Directions of Hon'ble NGT, further subject to such a retrofitment carried out through an agency which has a valid certification from any of the 5 authorized test agencies by CPCB in this context (viz. Automotive Research Association of India, Pune; International Centre for Automotive Testing, Manesar; Indian Institute of Petroleum, Dehradun; Indian Oil Corporation Research and Development Centre, Faridabad and Vehicle Research Development Establishment, Ahmednagar).

Nine States have mandated the state-wide
use of retrofit emission control tech.

Jammu & Kashmir (7th Feb'20)

Tamil Nadu (10th Jun'20)

Haryana (25th Jun'20)

Andhra Pradesh (5th Nov'20)

Kerala (9th Dec'20)

Goa (6th Jan'21)

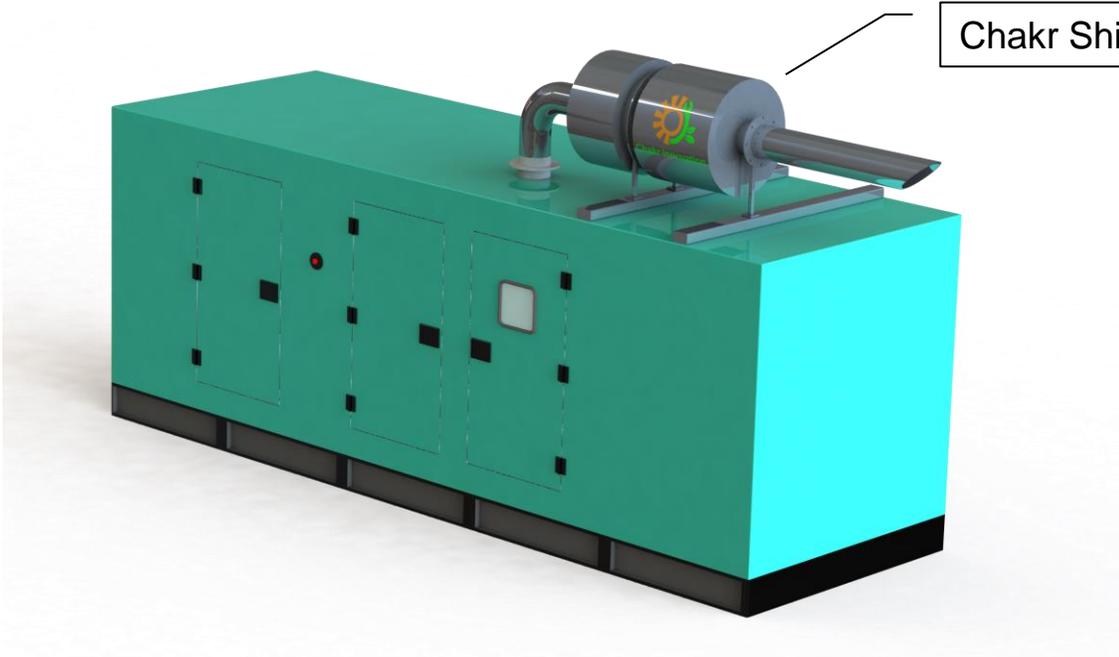
Gujarat (27th Aug'21)

Karnataka (17th Sep'21)

About Chakr

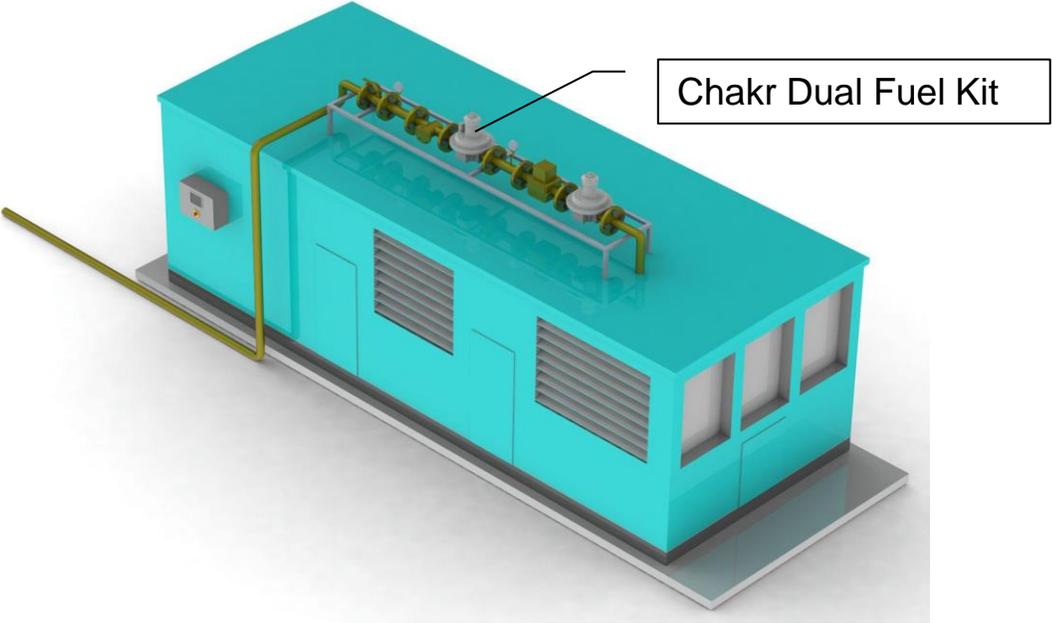
Chakr Innovation is an award winning cleantech start-up founded by IIT Delhi graduates.
Chakr's mission: To help people breathe cleaner air by developing & commercialising scalable technologies

Products



Chakr Shield

Patented and **Type approved** Emission Control Equipment for Diesel Generators with over 80% reducing efficiency



Chakr Dual Fuel Kit

Patented Dual fuel kit that makes an operational DG to operate on both Diesel and CNG/PNG

With over 350 installations completed across 80+ marquee clients in India

PSU and Defence



Manufacturing



Hospitality and Infrastructure



IT and Others



Let us create a greener tomorrow!



Thank you!

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