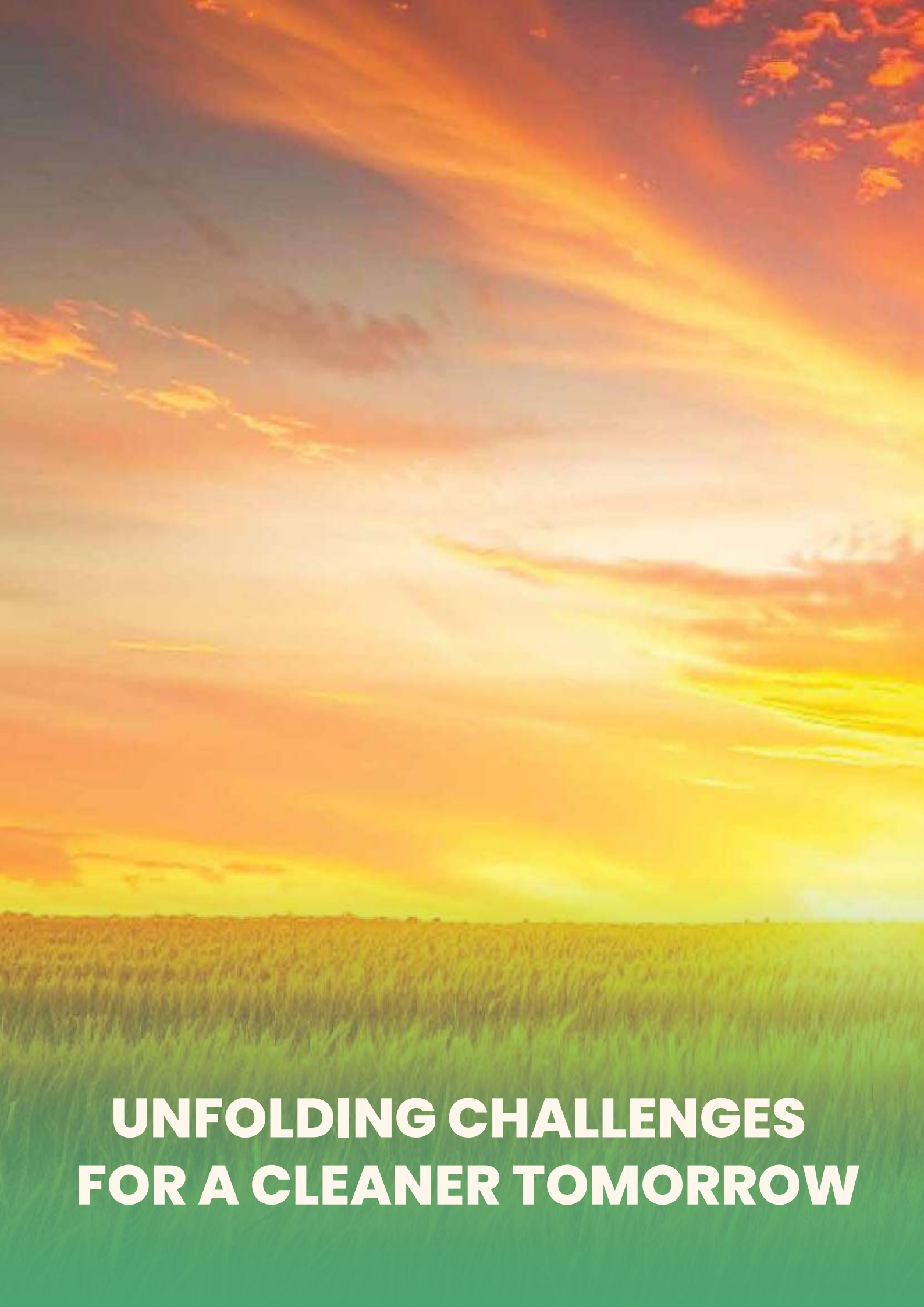




# Chakr Innovation

Materializing a Cleaner Reality

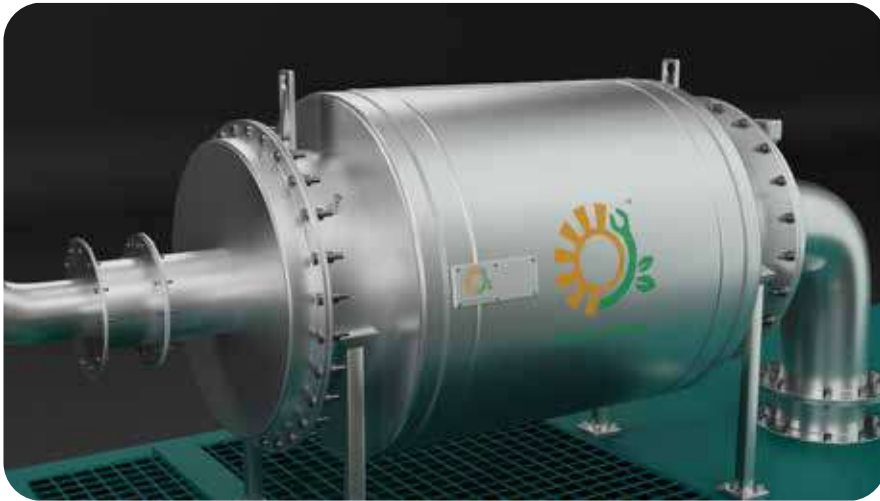
[www.chakr.in](http://www.chakr.in)



**UNFOLDING CHALLENGES  
FOR A CLEANER TOMORROW**

# OUR PRODUCT PORTFOLIO

*Innovation meets Sustainability*



Chakr Innovation offers a wide array of products including flagship product RECD -Retrofit Control Device, Diesel Generator Monitoring System (IoT).

## EMISSION CONTROL TECHNOLOGY

Expanding the reach of our emission control technology - wider applications in commercial vehicles, Marine Engines and Railways

*Extended usage*



### COMMERCIAL VEHICLES



-  TAM of ~USD 15-16bn in India with much bigger global potential market
-  Chakr's technology solution is compliant with BS-III and IV norms and has the capability to capture up to 90% of the PM emissions
-  Regulatory tailwinds and enforcement directives from State governments (State govt. of UP and J8K)




### MARINES ENGINES



-  Significantly large market opportunity with applications in diesel engines and propellers to reduce emissions in marine industry
-  Proposal submitted with Indian Navy for marinization of RECD technology for installation on marine application engines (tender released for the same)
-  Estimated market potential from Indian Navy is over USD 100mn+

### RAILWAY DIESEL GENERATORS

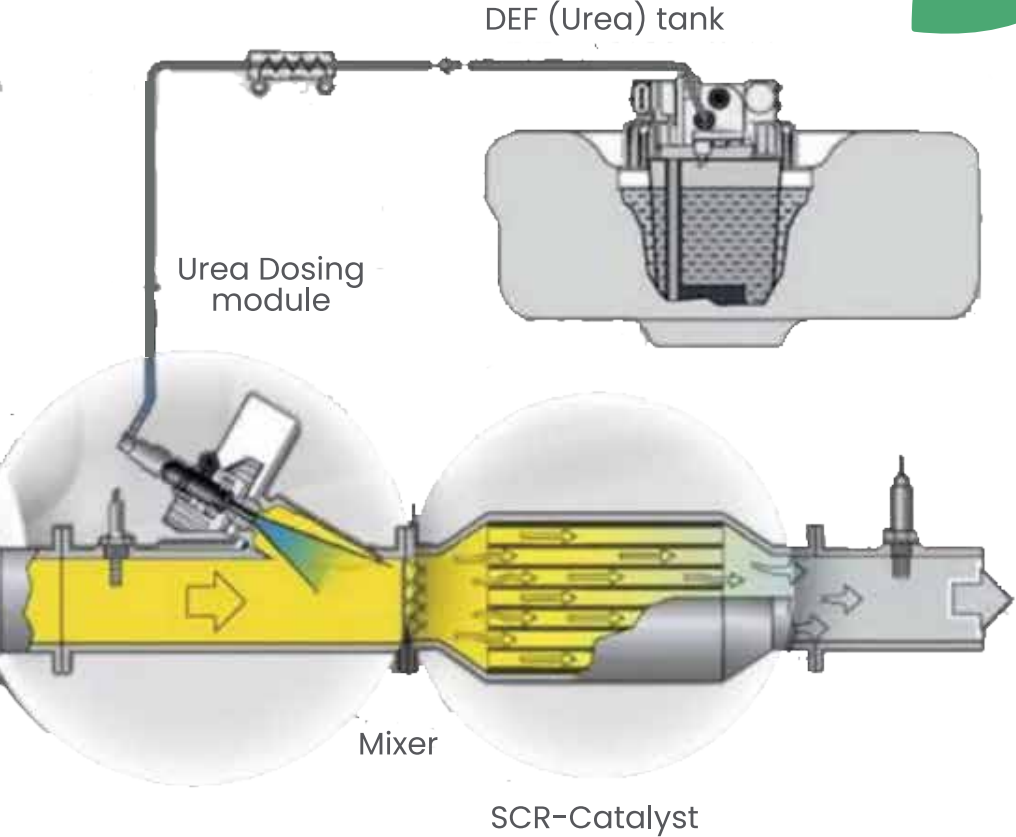
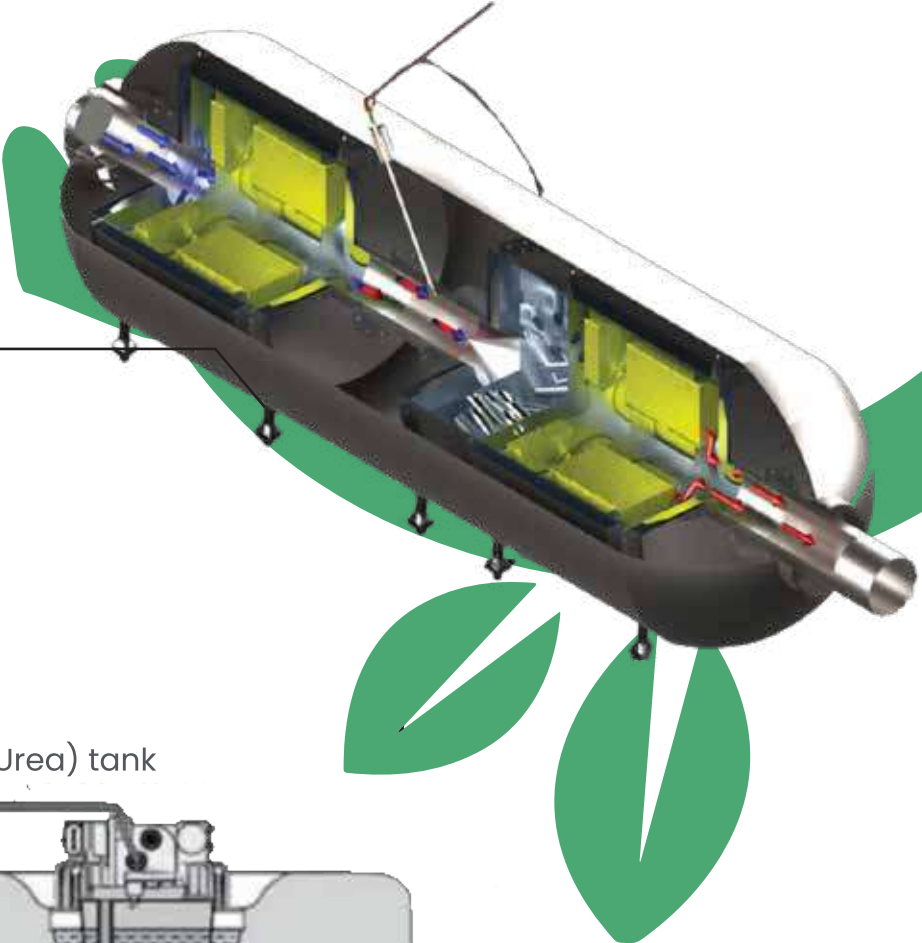


-  Total addressable market of ~USD 200-300mn with Indian railways
-  Chakr Shield 2.0 is compatible with 500 kVA DG sets of Cummins, KOEL and Greaves used in railway power cars
-  Ministry of Railways (RDSO) is in the process of conducting pilot on selected power cars with Chakr Shield



**Chakr Innovation**, we are aggressively advancing technologies like DG Monitoring Systems using IoT to track real-time generator performance and health. Our goal is to support DG owners by saving time, managing efficiency, and reducing operational costs. Building on our successful implementations, we are also developing NOx reduction technology. The DeNox product is designed to reduce NOx emissions from diesel and gas generators, specifically tailored for Indian operations and environmental conditions.

**DENOX**



# ALARMING FACTORS OF DIESEL GENERATOR

## HEALTH HAZARDS



### Respiratory Issues:

Asthma, Chronic Obstructive,  
Pulmonary Disease



### Cancer:

PM2.5 from Diesel Exhaust  
is a Class-I, Carcinogen (WHO)



### Cardio Vascular:

Stroke and Ischemic  
Heart Disease



### Maternity Complications:

18% higher likelihood  
of Preterm Birth

## POLLUTANTS

- Nitrogen Oxides
- Hydrocarbons
- Carbon Monoxide
- Particulate Matter

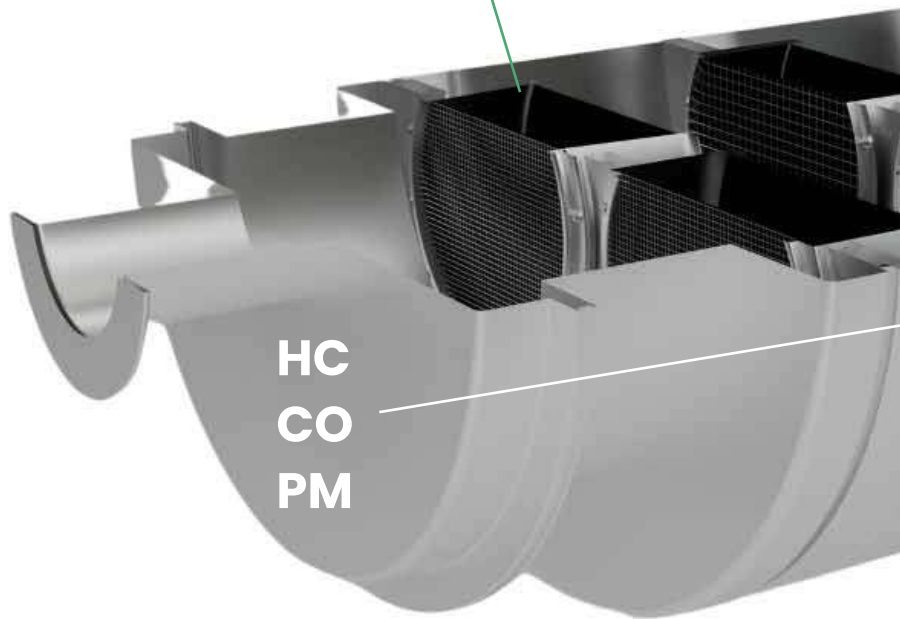


# HOW CHAKR SHIELD TECHNOLOGY WORKS-

The Chakr Shield is an advanced retrofit emission control device designed to efficiently capture and neutralize harmful emissions such as Diesel particulate matter, hydrocarbons, and carbon monoxide emitted from diesel generators. It operates on a sophisticated, proprietary catalyst-based technology featuring a two-stage process. Oxidation and Passive Regenerative Trap (PRT).

## Oxidation

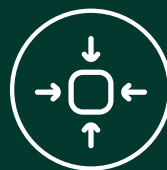
In the oxidation stage, it transforms gaseous and aerosol pollutants, such as hydrocarbons, carbon monoxide, and soluble particles, into harmless CO<sub>2</sub>. This is achieved using a proprietary catalyst that ensures high reliability and durability of the system's performance over a long operational lifespan. The system is customized specifically for Indian diesel generators.



HASSLE FREE  
CLEANING



LOW MAINTENANCE



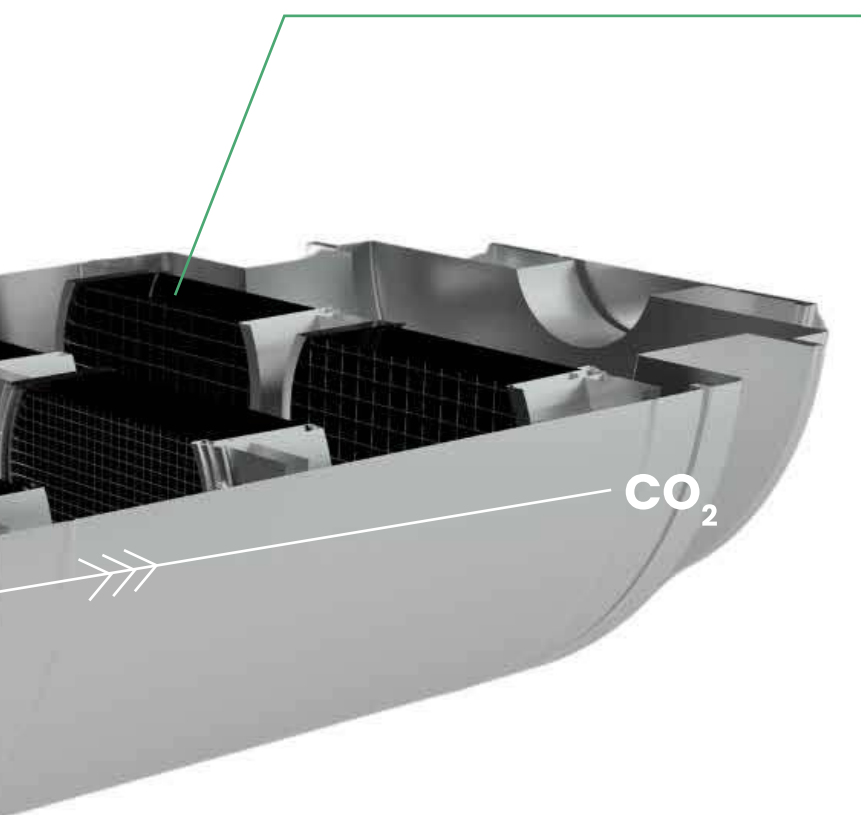
MODULAR COMPACT



LONG PRODUCT  
LIFE

10-12 YEARS OR  
40000-50000HOURS

In the oxidation process it converts gaseous and aerosol pollutants into harmless gases and water vapour. The PRT chamber functions on the principle of positive filtration, synchronized with rapid oxidation, which reduces solid pollutants and at the same time ensuring no deposition. The combined reduction of pollutant in oxidation and PRT results in an overall 95% reduction in PM, HC and CO.



### PRT (Passive Regenerative Trap)

During the PRT stage, the process operates on the basis of positive filtration combined with rapid oxidation. All solid pollutants are captured at this stage, and the proprietary catalyst that is uniformly coated on PRT ensures that the pollutants are continually oxidized into harmless gases without consuming any electricity or external energy, resulting in no pressure decrease.



NO BY PRODUCTS



ECO FRIENDLY



TYPE APPROVED



NO ADVERSE IMPACT  
ON ENGINE

# SALIENT FEATURES



Modular & Customisable: Adaptive for any site, new or existing.



All-Weather Proof: Designed for low maintenance in any weather.



Robust Design: Works with various DG set conditions.



No Exhaust Temp Dependency: Functions without relying on exhaust temperature.



Noise Level  $< 75$  DB: Noise equivalent performance as a muffler



Minimal Flow Restriction: Superior to conventional filter-based tech.



No Fuel Penalty: Zero additional fuel consumption.



Smart Tech: IoT diagnostics with cloud notifications.





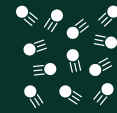
No adverse Impact on engines: Back Pressure: under permissible limit.



Zero Power consumed for filtration



No moving parts, ensuring low maintenance and prolonged maintenance



No Consumables: Collection once in 4-6months



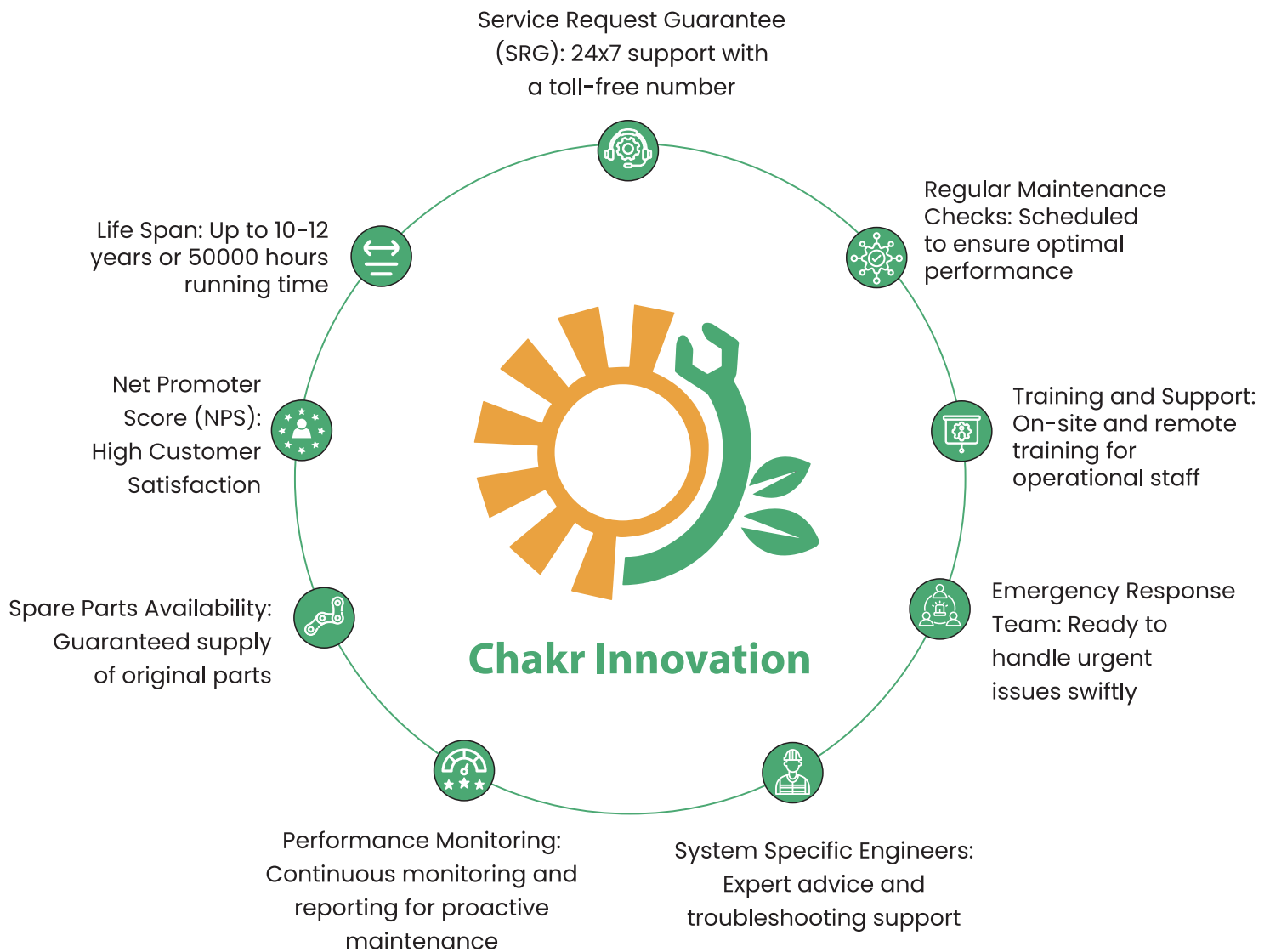
Eco-Friendly: No particulate disposal or secondary pollution.



Simple & Efficient: Consistent performance, long life.



# WE UNDERSTAND YOUR EVERY MINUTE IS PRECIOUS



**\*Disclaimer: Minimum Temperature for oxidation efficiency in RECD to achieve 250 degree Cel**

# THANK YOU FOR TRUSTING US!

<p>Défense &amp; Aviation</p>	<p>Hospitals</p>
	
<p>Hospitality</p>	<p>FMCG</p>
	
<p>Corporates</p>	<p>Infrastructure</p>
	





# REWARDS & RECOGNITION



UN Environment

ASME- The American Society of Mechanical Engineers

Champion of Change

Forbes

Good Air Award 2024





# MEDIA COVERAGE

 **Discovery**

**THE ECONOMIC TIMES**

**Business Standard**


**Business India**

**Forbes**





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