



Umweltschutz-Technologien

Environment Protection Technologies



EGT Retrofit for India

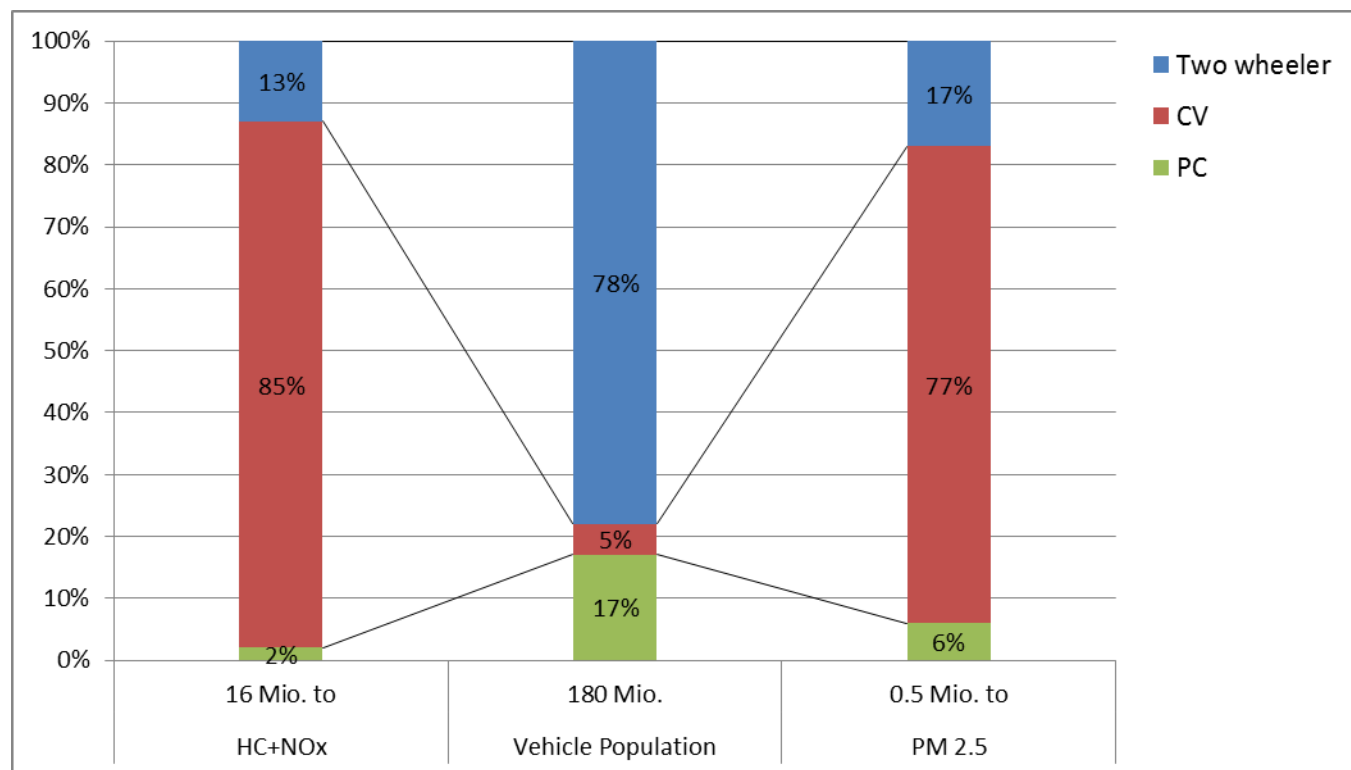
November 2016
P. Neumann

Air Pollution

Central problem in 9 of 10 major cities worldwide



Vehicle Population in India 2013



9 Mio. CV deliver approx. 75% of the PM and NO_x emissions

Database: Vehicle Population 2013 by Ministry of Road Transportation

Assessment of options to improve air quality

BS VI by 2020	Scrappage Veh. older 10 years	Retrofit of CV
Market penetration takes long time	Regulation, Compensation	Regulation, Incentives

Three Initiatives to reduce overall diesel pollution are in discussion:

1. Countrywide enforcement of BSIV and BSVI,
2. Scrappage of vehicles older than 10 years (regulation draft under evaluation),
3. Retrofit mentioned in press releases but no regulation activities visible yet.

Indian Emission Standards (4-Wheel Vehicles)

Standard	Reference	YEAR	Region
India 2000	Euro 1	2000	Nationwide
Bharat Stage II	Euro 2	2001	NCR*, Mumbai, Kolkata, Chennai
		2003.04	NCR*, 13 Cities†
		2005.04	Nationwide
Bharat Stage III	Euro 3	2005.04	NCR*, 13 Cities†
		2010.04	Nationwide
Bharat Stage IV	Euro 4	2010.04	NCR*, 13 Cities†
Bharat Stage V	Euro 5	(skipped)	
Bharat Stage VI	Euro 6	2020.04	Entire country

→ If scrappage of vehicles older than 10 years will be undertaken the BS II/III vehicle population is still a huge potential to reduce emissions




- * National Capital Region (Delhi)
- † Mumbai, Kolkata, Chennai, Bengaluru, Hyderabad, Ahmedabad, Pune, Surat, Kanpur, Lucknow, Sholapur, Jamshedpur and Agra

How to define Retrofit?

Retrofit

- Modernization (up-grade), Improvement of functionality and performance
- Installation of state-of-the-art exhaust-gas after treatment systems
- Cost-effective and immediate reduction of hazardous emissions to protect Environment and health

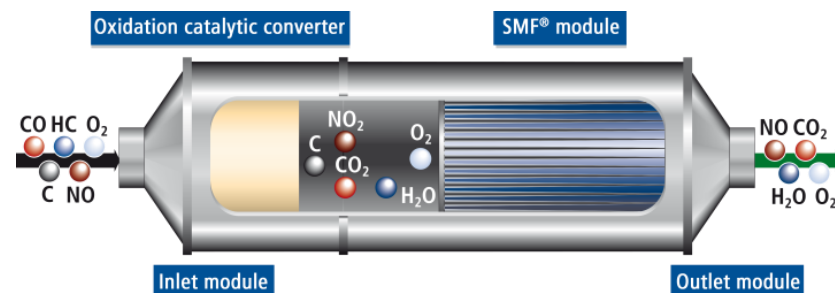
Technical Assessment of Retrofit

	NOx reduction by SCR	PM reduction by DPF	PM reduction by 50%
BS II/III			

→ Retrofit of BS II/III CV vehicles with DOC + partial flow particulate trap is technically possible and economically doable. This solution is already used for BS IV.

CRT- pSMF[®] Technology (example)

Suitable for vehicle applications with sufficient exhaust gas temperature of approx. 250° C – Buses, Coaches and Trucks



















Particulate Filter for Passenger Cars HJS City-Filter®

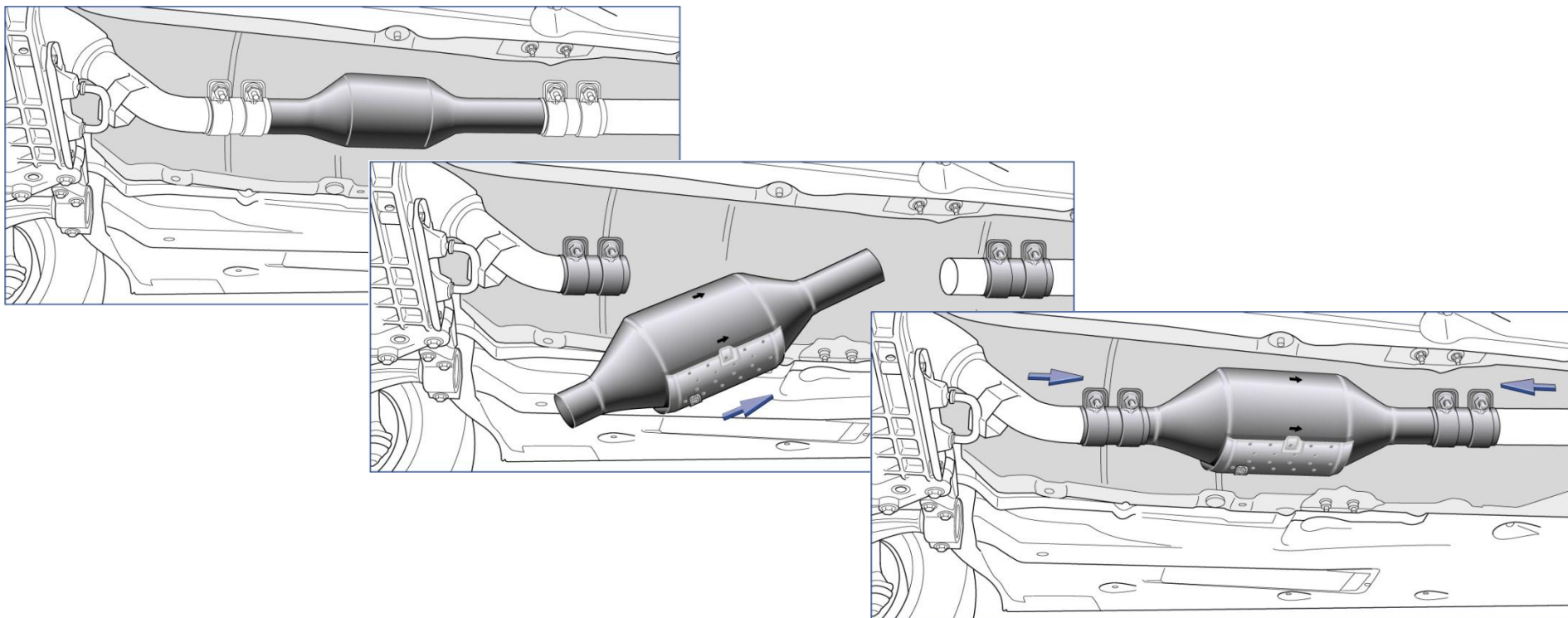


PC: Installation into Passat and Golf IV TDI in ca. 30- 45 minutes



Sample for installation: Audi A6 2.5 TDI

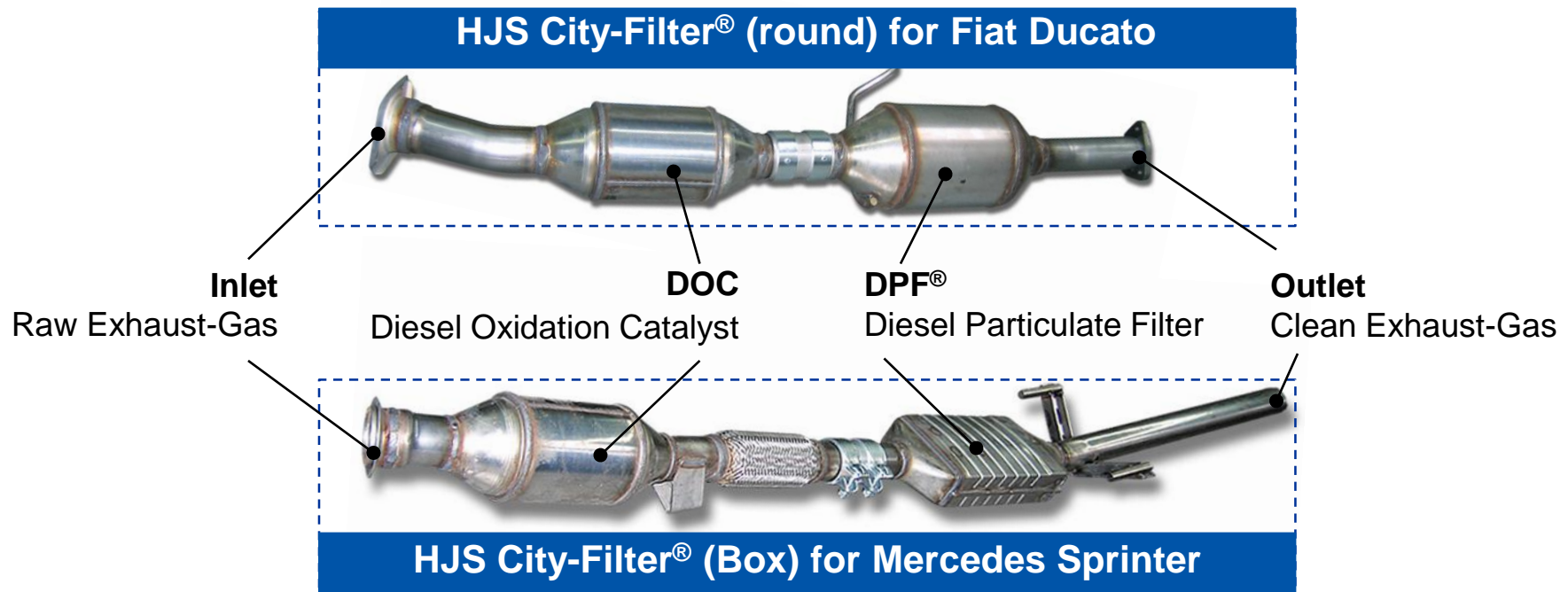
 Hersteller/Fzg.-Typ/Karosserieform	 Typ	 Hubraum	 Leistung	 Motorcode	 Getriebe S/A	 Bauzeitraum	 Fahrgestellnummer	 HSN /TSN	 Artikel-Nr.	 Bemerkungen	 Abgasnorm	 Plakette	 Hersteller/Fzg
Audi													
A6 II 2.5 TDI Stufenheck/Avant	4 B	2,5	120	BDG	A	02.2003 - 01.2005	4B-3-075 123 - 4B-5-050 000	0588 799/800	93 11 3005	PM3 ⓘ	Euro 4		A6 II 2.5 TDI Stufenheck/Avant
A6 II 2.5 TDI Stufenheck/Avant	4 B	2,5	120	BFC	S	07.2002 - 08.2003	4B-3-000 001 - 4B-4-023 802	0588 799/800	93 11 2006	PM2 ⓘ	Euro 3		A6 II 2.5 TDI Stufenheck/Avant



Particulate filter for light duty vehicles HJS City-Filter®



Products – Light Duty Vehicle (LDV)



- open particulate filter including DOC for LDV
- different forms for many applications
- **filter efficiency of more than ca. 60 %** of soot reduction
- complete system incl. holder and installation kit for easy installation

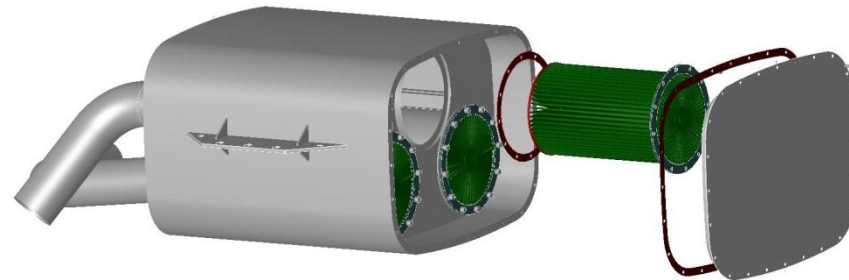
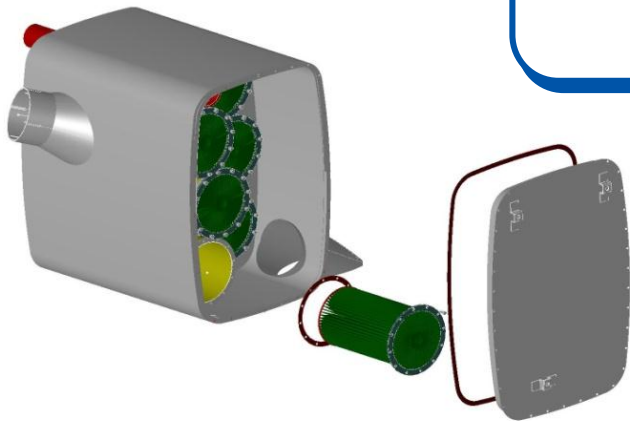
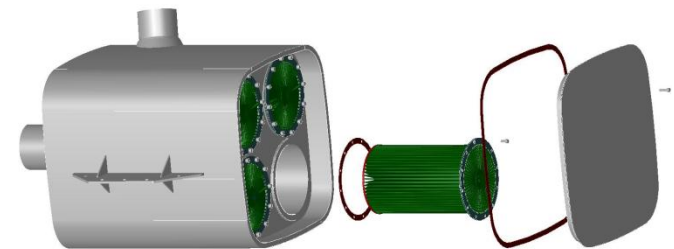
HJS DPF System SMF[®]- CRT[®] for Heavy Duty Vehicles



Different forms of SMF[®]-Systems for nearly all applications



**Product portfolio
for the most important
truck types**



Quick and simple Installation

- The catalyst- and SMF[®]-modules for trucks are integrated in a stainless-steel silencer housing, which allows easy installation in the existing exhaust system without the need for any interface modifications.
- The original silencer system is simply and quickly replaced by the identically dimensioned HJS system.
- Installation time 4 – 5 hours



HJS SMF[®]-System for a Mercedes-Benz Actros EURO III



Mercedes ECONIC



MAN TGA

Retrofit solutions for all common CVs and buses

Product Range Diesel Particulate Filter



Commercial Vehicles

www.hjs.com

HJS
Emission Technology

- HJS developed retrofit kits for all common commercial vehicles and buses for the European market.
- This principal can also be transferred to India.
- The design has to follow the required Indian specification and boundary conditions.
- User friendly and easy to maintain.
- Value proportion of vehicles and retrofit system must be economical and rational.

Product Range Exhaust-gas aftertreatment systems for Public Transport Buses



SMF[®] system with DOC
SCR system
SCRT[®] system

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Emission Technology

Retrofit for the Indian market

Retrofit systems for vehicles can be customized and adapted to the technical and economic needs of local Indian requirements

- ➔ **Retrofitting existing fleets of vehicles means:**
- An immediate reduction of pollutant emissions at source
 - A cost-effective alternative to purchase new vehicles
 - A kit system for each model can be developed
 - System will be monitored by ECU and driver will be informed via display about the performance of the system
 - Maintenance and training of mechanics and driver is mandatory

Vielen Dank

Thank You

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