



DPF implementation in IRAN, opportunities and challenges

9th VERT Forum – Mahdi Doozandegan – 15/03/2018, Dübendorf

- Introduction to ASA
- Review of Tehran air quality
- Retrofit Market in Iran
- OEM Market
- DPF for Off-road vehicles
- Other DPF related projects

ASA at a Glance

Introduction to Azmoon Sanat Arvin

ASA at a Glance

Company type:

- Knowledge base - Private Company

Founded: January 2014

Staff numbers: 12

Scope of products:

- Consulting services on Clean Transport
- Emission Test Engineering Services

Foreign partners:

Horiba, VERT, CPK, Aerosol, EHC

Some of our clients:

AQCC, UBCT, IKD, Saipa Diesel,
Zamyad, Mayan Group, DESA
Mammut, ...

VERT and ASA have started their official cooperation from Jun of 2016



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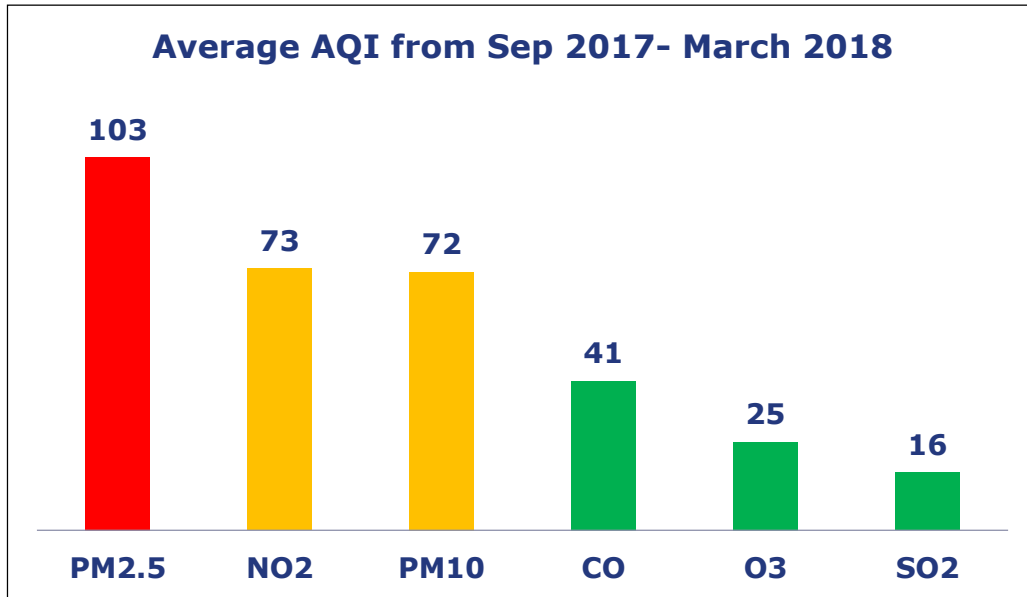


Tehran air quality

AQI/PM2.5/ BC

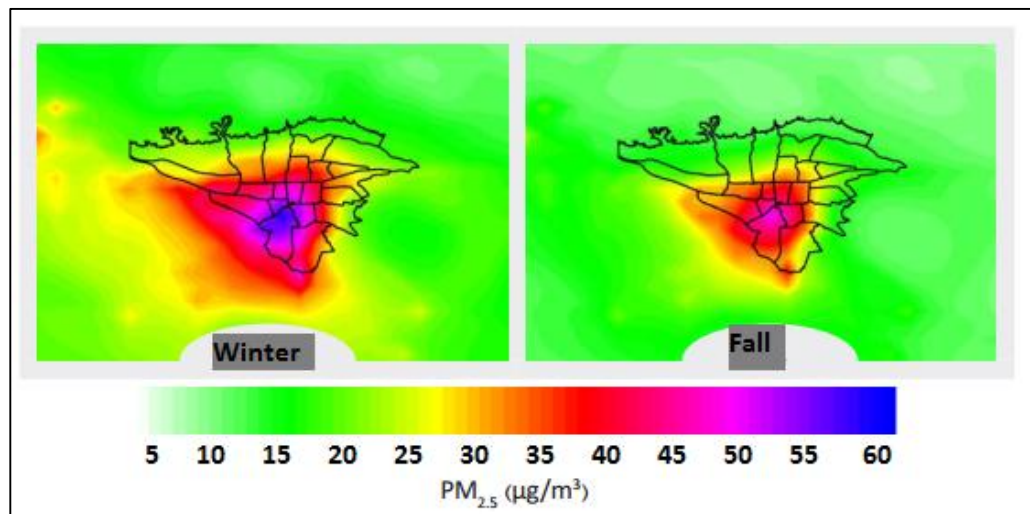
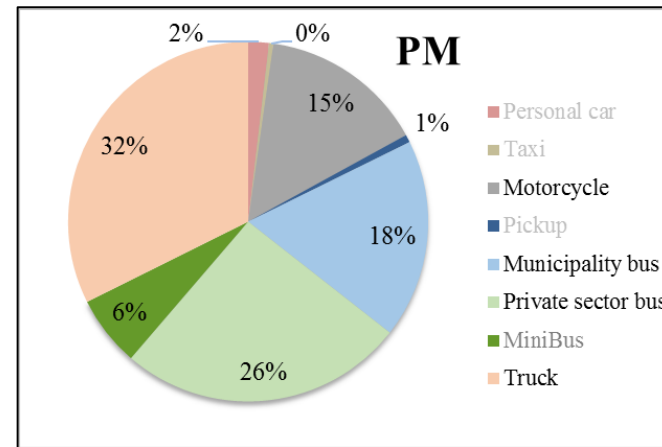
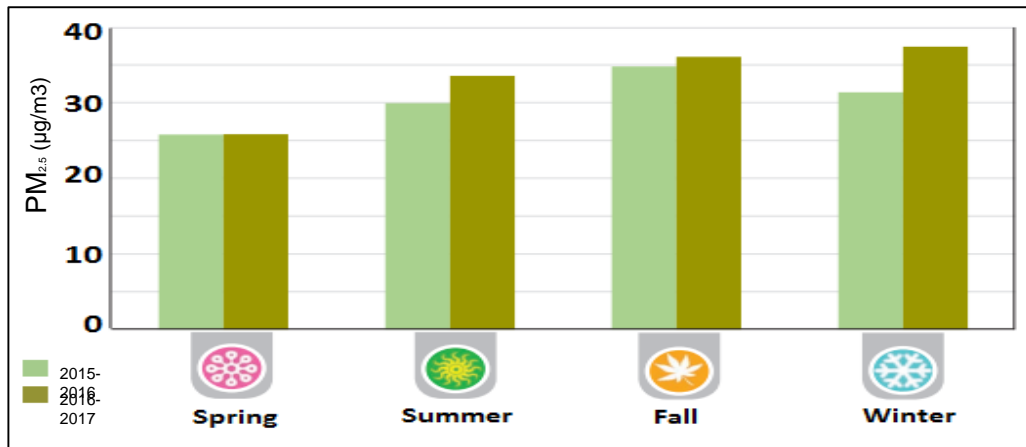
AQI

	Mar2016-Mar2017	Mar2017-Mar2018
AQI	Number of days	
0-50/ Clean	16	14
50-100/ Healthy	253	236
100-150 /Unhealthy for sensitive people	79	99
150-200/ Unhealthy for all people	9	8



AQI
increased by
5% in
compared
with previous
year.

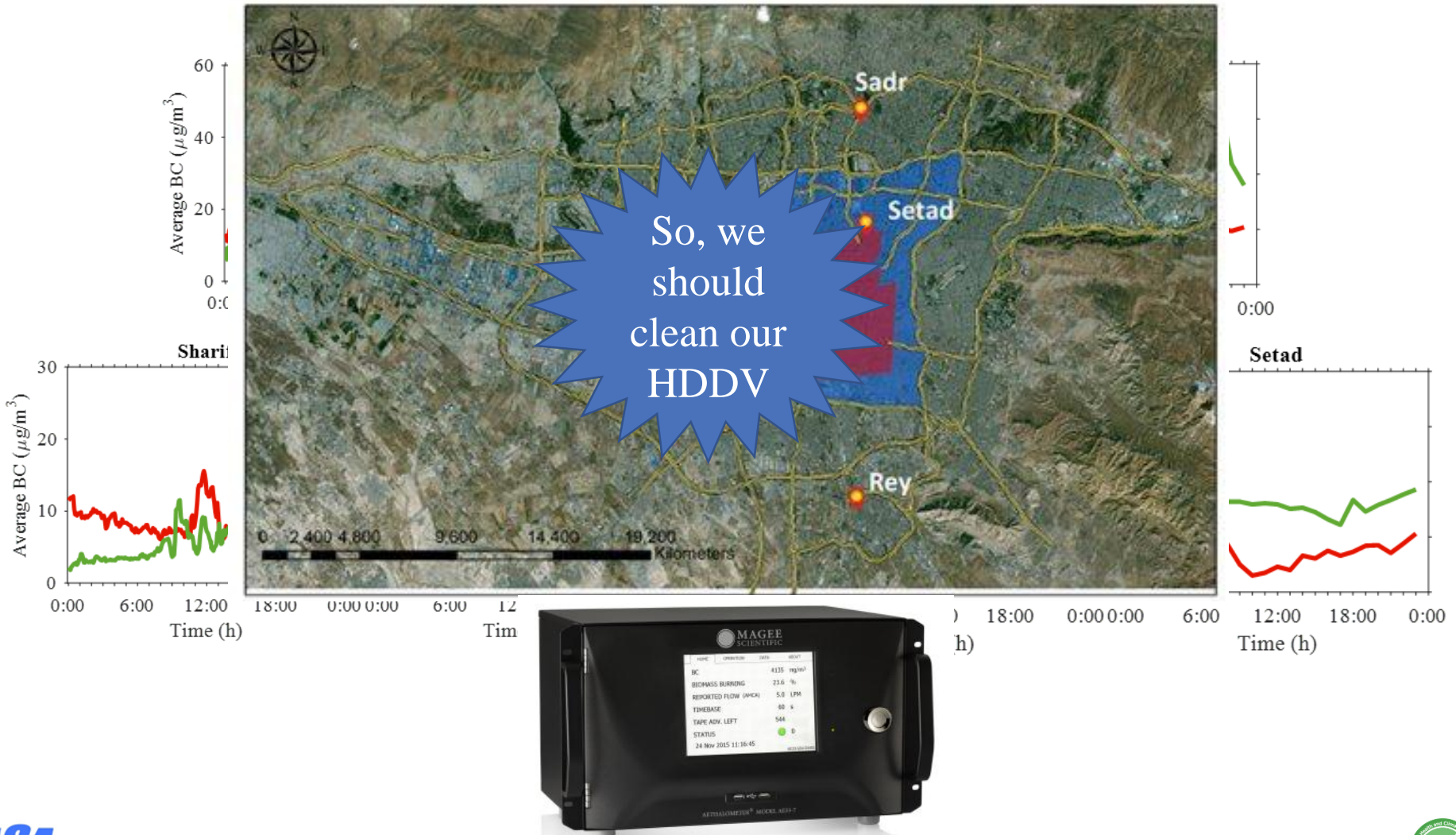
PM_{2.5}



But this is only emission inventory for primary particles

BC

- BC, more realizable parameter



Legislation for HDDV

History:

- New legislation was approved on April 2015 : “EU 4 + DPF – Sep 2016”.
- Guideline draft have been prepared and was sent to DOE on Feb 2016 (Iran IVa and Iran IVb)
- Implementation time was postponed to March 2017 due to lack of details of DPF law.
- EEV standard was added to the previous legislation on Feb 2017 and Iran IVa was not approved.
- DOE have not published details of EU 4 + DPF law by the time.

EU 4 + DPF or EEV

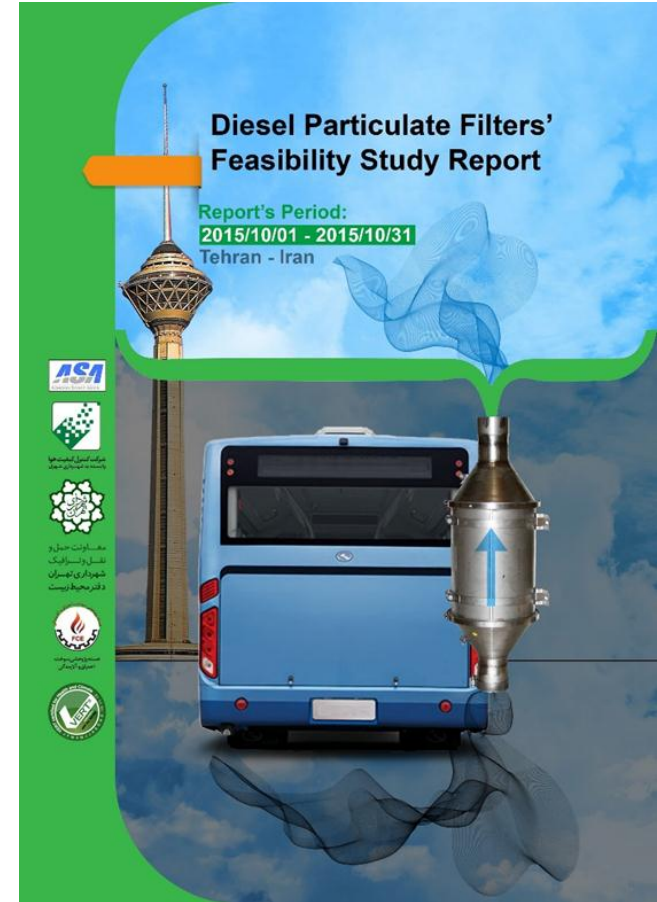
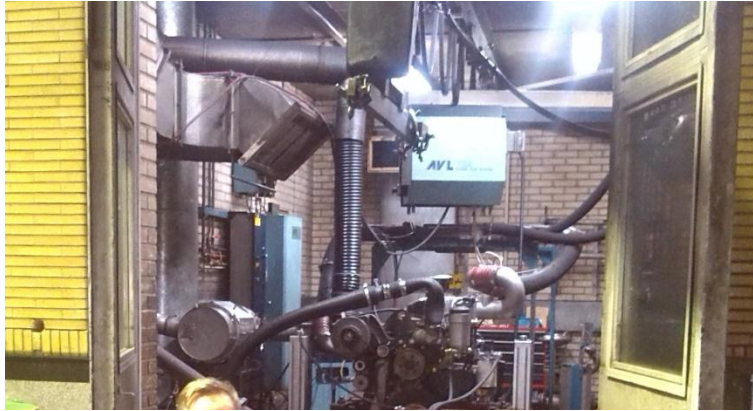
DPF retrofit Market

Plan, actions, challenges and solution

Past actions

➤ DPF feasibility study project

- Engine lab tests
- Real-world pilot test



Current situation

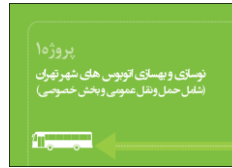
- First retrofit project completed
 - 50 DPFs installation on EU2 OM457 Buses
- Second retrofit project's tender was held
 - 200 DPFs for BRT Buses with MAN EU 3 engine



Future plans

➤ Government plan

- 15,000 city buses retrofit in 8 mega-cities
- Probability: low



DPF Retrofit Program
~ 2000 Municipality Bus

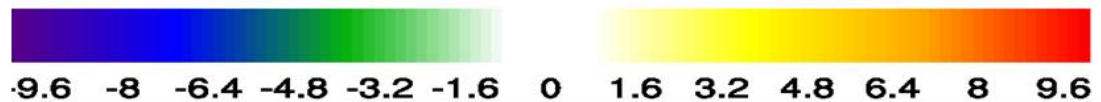
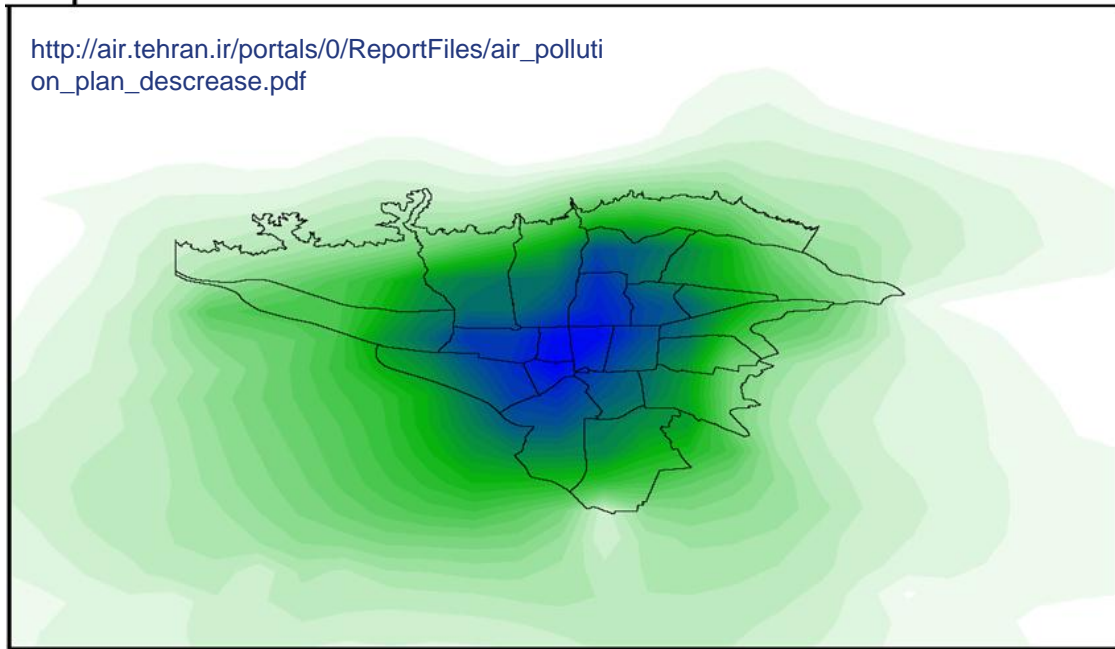
➤ Tehran municipality

- Comprehensive Air Pollution Reduction Program
- Probability: high

➤ Other cities:

- Isfahan
- Mashhad

http://air.tehran.ir/portals/0/ReportFiles/air_pollution_plan_decrease.pdf



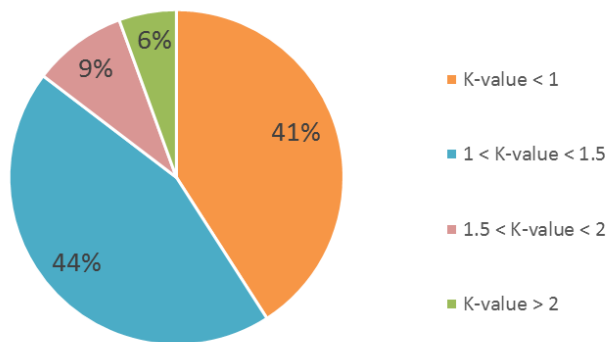
PM_{2.5} reductions (%)

Tehran's bus fleet status

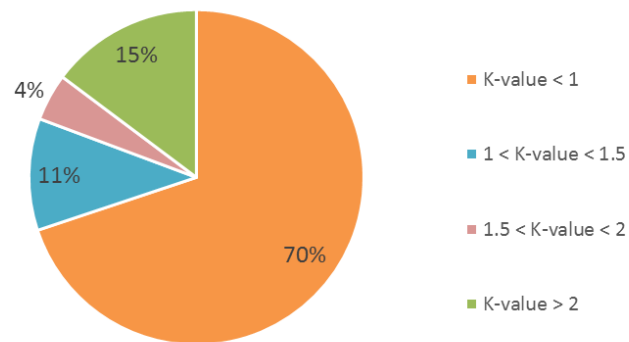
Diesel fuel
is EU 4

Most of buses have appropriate k-
value for DPF installation

BRT Line Buses K-value status



OM457 City Buses K-value Status



Challenges and Solutions



Poor maintenance

High idling

Low educated users



DPF workshop for Tehran UBCT's staff and drivers
March 2017

Feasibility study of using idle limiter module on Tehran city buses

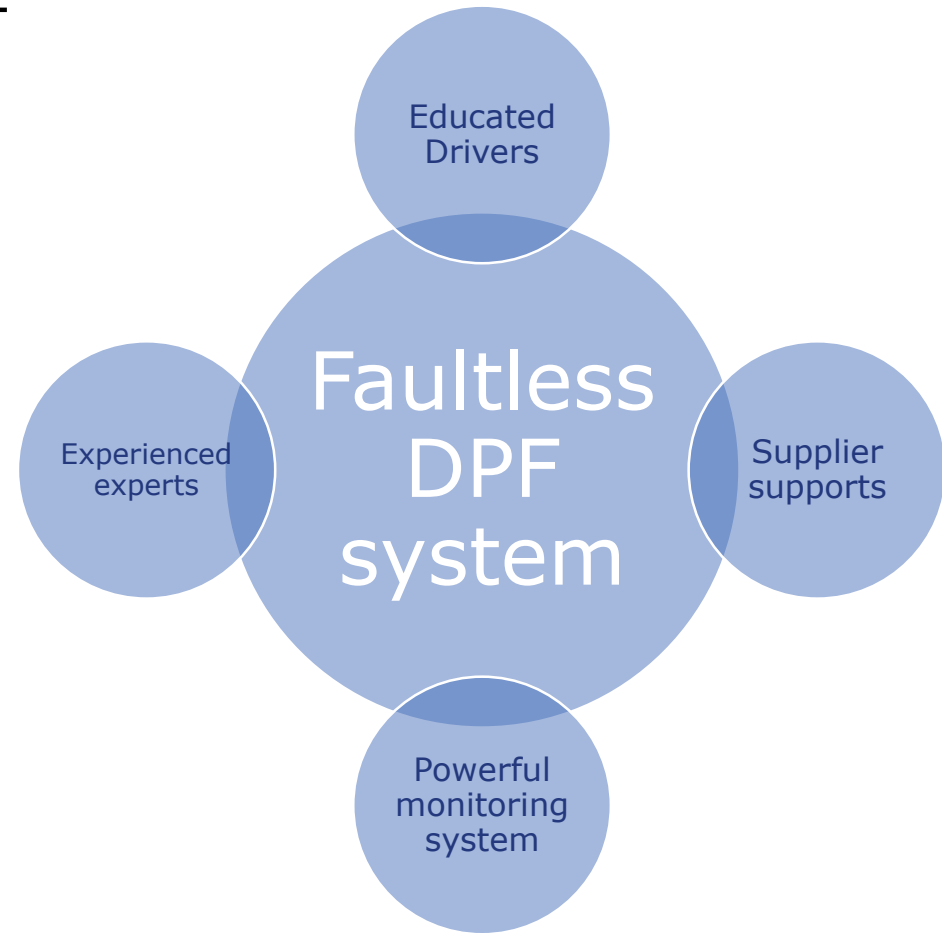
اسفند ۱۳۹۶

استفاده از ماژول کاهش کارکرد درجا
در ناوگان اتوبوسرانی شهر تهران



We have learned, for faultless DPF operation, we need:

- Regular field inspection and maintenance
- Periodic verification
- Online monitoring of DPFs operational functions (back-pressure)
- Regular fuel quality testing
- Workshops for drivers and staffs



DPF OEM Market

Outlook, current situation, challenges and solutions

New vehicles' category- currents situation

OEM-with R&D



OEM-without R&D

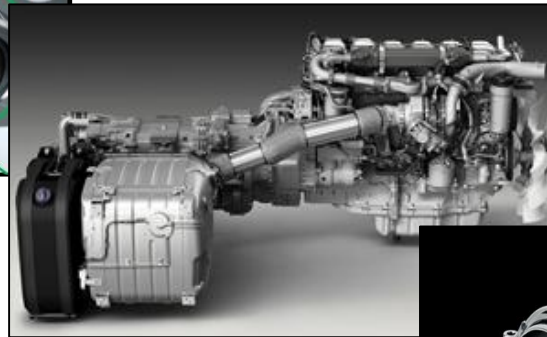
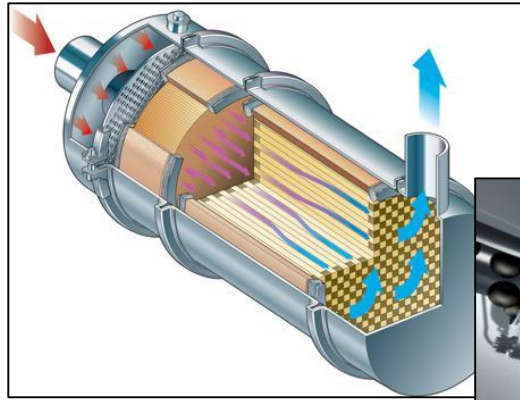


Option fit



Currents situations: Quantity and Technologies

- Estimation for current DPFs' quantity: 10,000
- Used technologies:



Challenges and Solutions



EU 4 diesel station will be available nation-wide

High sulfur fuel

Lack of detailed documentation

In- appropriate PTI centers



ASA and AQCC have started a research project for upgrading PTI centers.

قوانین جدید آلاینده‌های موتورهای دیزل سنگین با کاربری زمینی یا متحرک

Private Public Partnership for elimination of ultrafine particle emissions in Iran

Guidance Document for Detailing the Cabinet of Ministry's Decision

Compression Ignition Commercial Vehicles DPF Introduction for new Heavy Duty Vehicles

Department of the Environment Guidance Document for detailing the Heavy Duty Emission Legislation for the Introduction of DPF in IRAN from the Stakeholder Process.

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Pfungstadt, Germany, February 29th, 2016

It is in process

Off-road market

Construction machines, diesel generator and mining machine

Construction machines

- **Tehran city council directive for construction machines operating in Tehran**
 - PTI should be mandatory
 - Strict emission limit for LEZ are
 - DPF should be mandatory for LEZ are
- **First draft of guideline was sent to city council**
 - PN sampling for DPF equipped vehicles
 - Opacity measurement for variable rpm vehicle



Mining machines

Mining machine projects

- We just have started a project to retrofit EU 2 dump-truck
- Challenges
 - Very high sulfur content diesel
 - Environment
 - Low quality maintenance



Diesel generators

- **Emergency gensets**
 - Hospitals
 - Banks
 - Governmental buildings



Other projects

Temporary DPFs for terminals, idling controller

Temporary DPF

➤ Feasibility study project

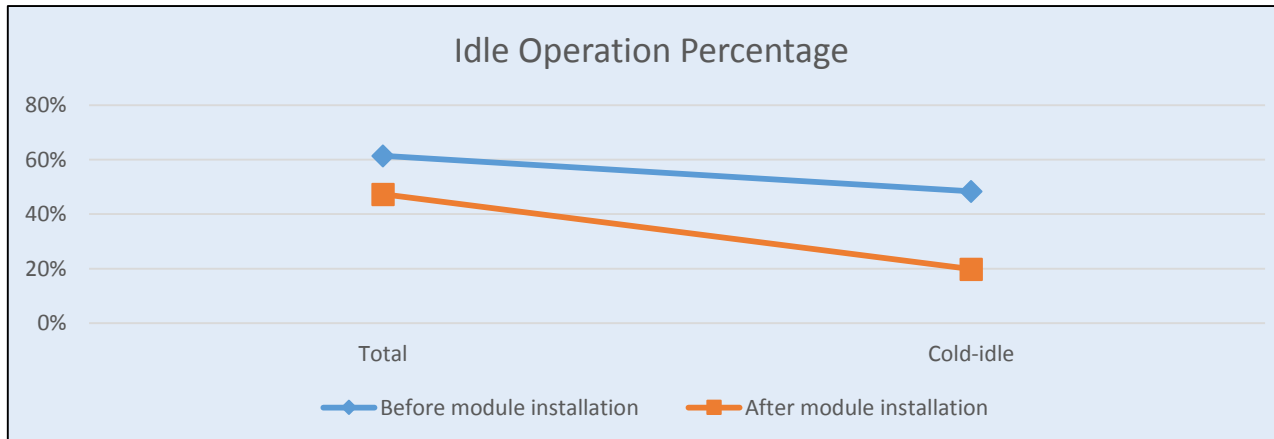


Stop Idling

Using Idle limiter devices:



IdleControl-Module



Discussions are welcome
Thank you for your attention

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