

המשרד להגנת הסביבה



الوزارة لحماية البيئة  
Israel Ministry of Environmental Protection

Israel's Ministry of  
Environmental Protection

# DPF-retrofit for HD-vehicles in Israel

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10<sup>th</sup> VERT FORUM

Dübendorf, Switzerland

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# Israel in one slide

- ▶ Area ~ 22,000 km<sup>2</sup>
- ▶ Population ~ 9M inhabitants
- ▶ Population density ~ 409 inhabitants/ km<sup>2</sup>
- ▶ 3.6M vehicles
- ▶ 59.6 Bkm total annual mileage
- ▶ Vehicle split by fuel:
  - Gasoline: ~85%
  - Diesel: ~15%
- ▶ Air quality challenges: Particles, NO<sub>2</sub>, O<sub>3</sub>





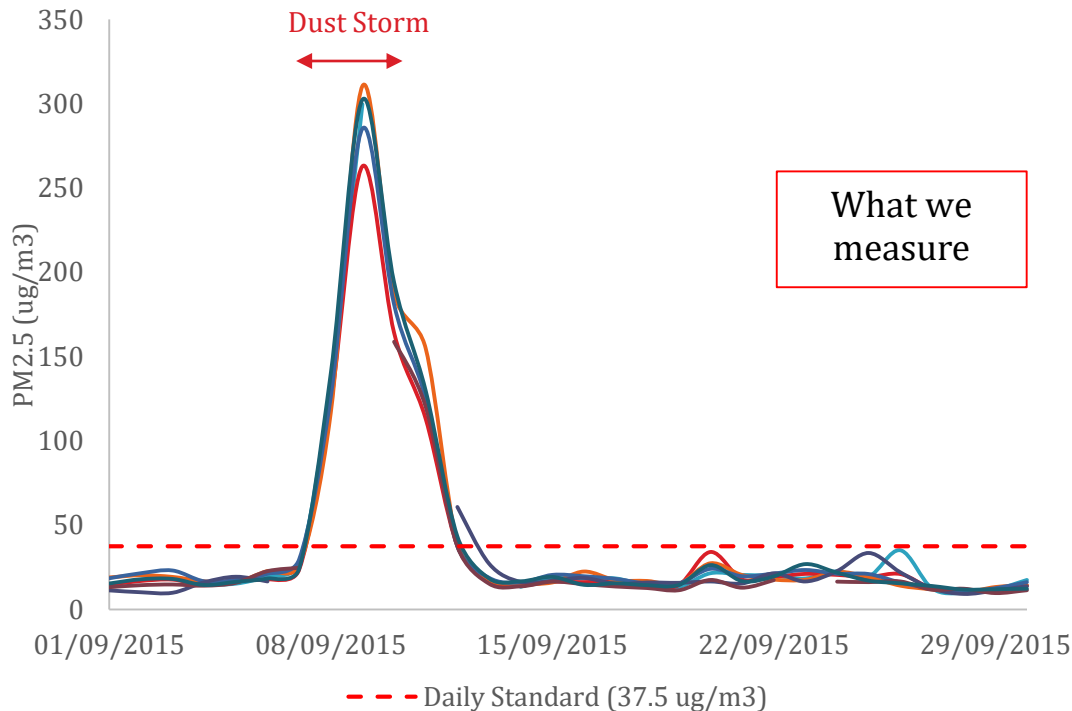
# High PM background

Dust storm approaches Israel



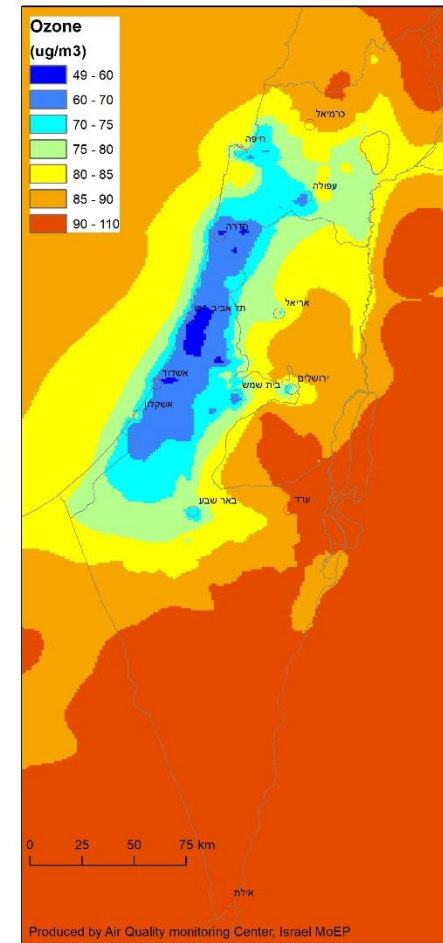
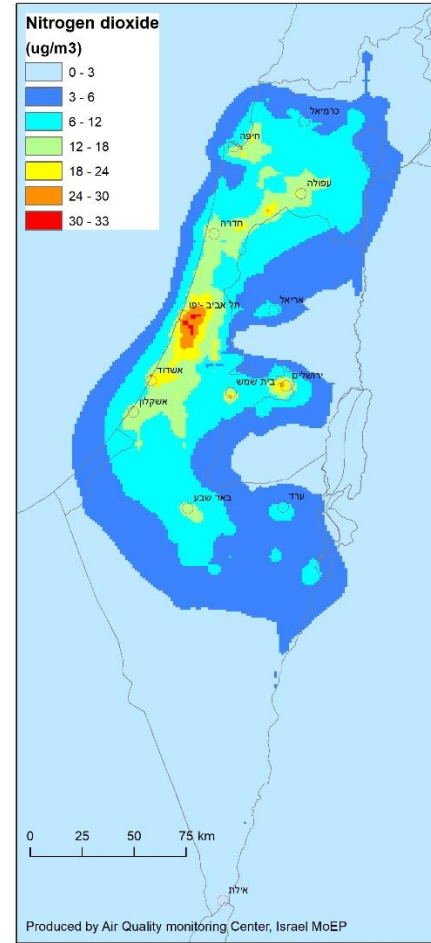
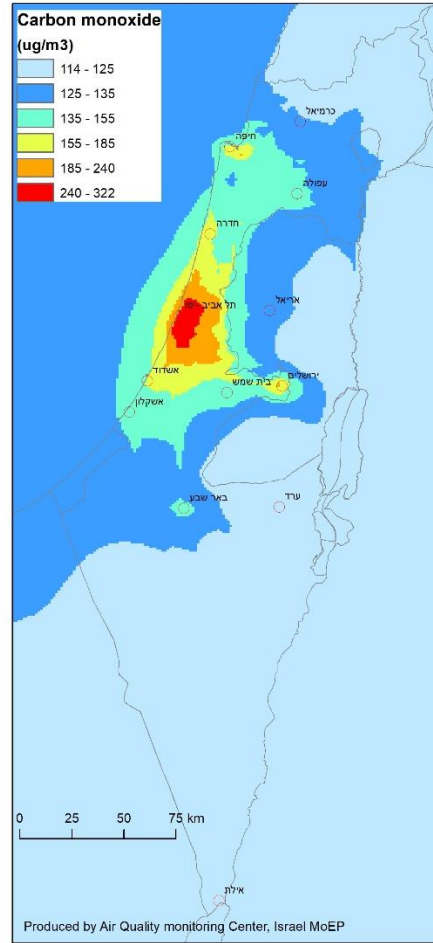
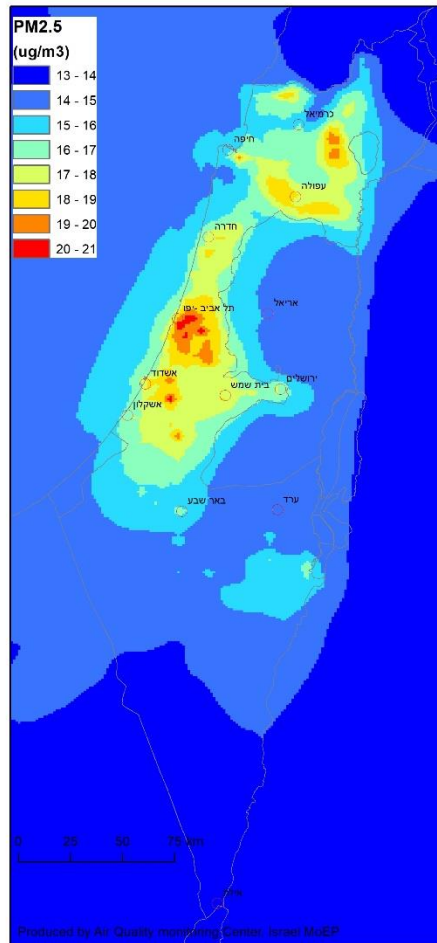
it looks like from Tel Aviv

Daily PM2.5 in Tel Aviv area



How it feels

# Air Quality in Israel (2017 annual average)



PM2.5

CO

NO<sub>2</sub>

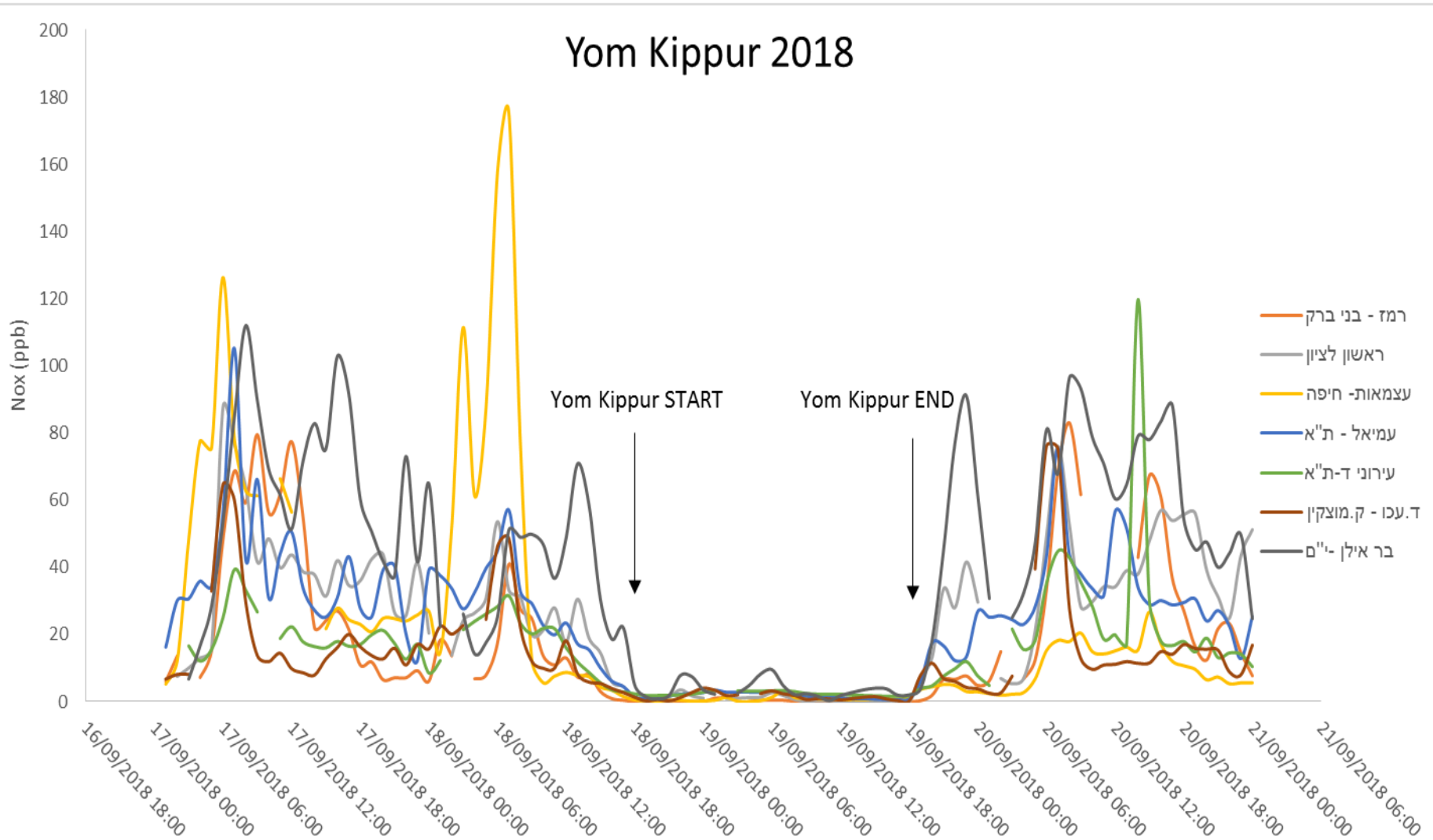
O<sub>3</sub>

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High primary pollutants levels in metropolitan areas

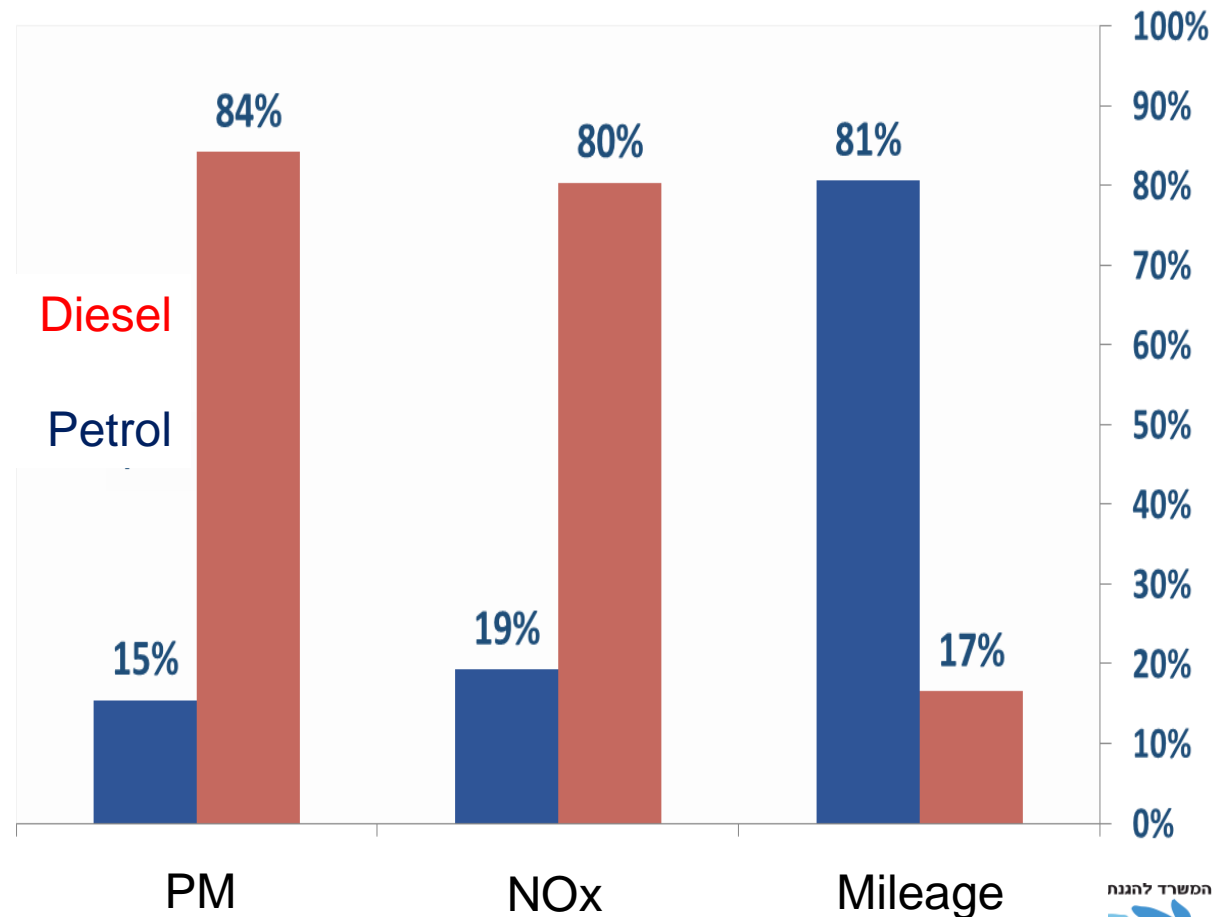
High ozone levels inland

# Transport emissions dominate air quality at city centers



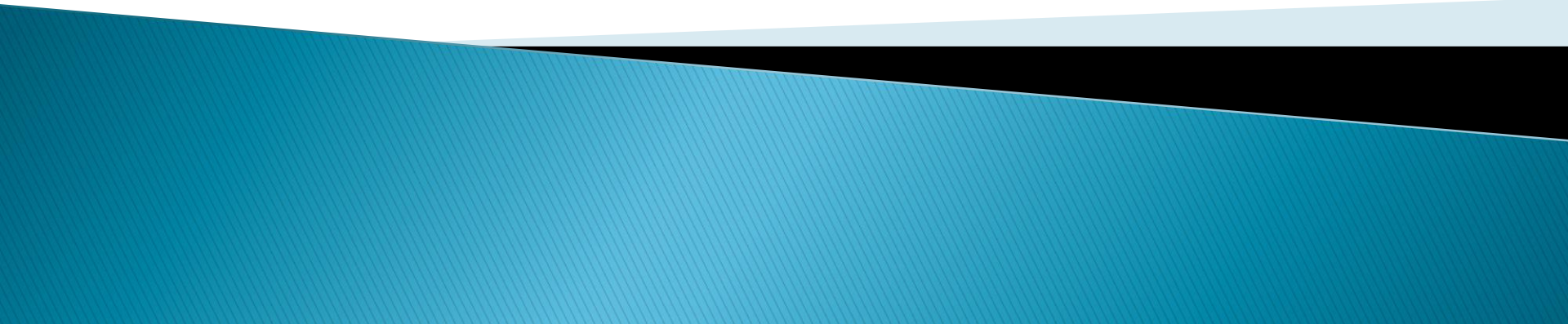
# Emission by fuel type

- ▶ Most private vehicles run on petrol
- ▶ Diesel vehicles:
  - 17% of the mileage
  - 80% of PM and NOx emissions





# **Government Activities to reduce Vehicle Emissions**







# First LEZ in the city of Haifa

- ▶ 50-60% subsidies for DPF retrofits
- ▶ ~100 retrofits on buses and trucks



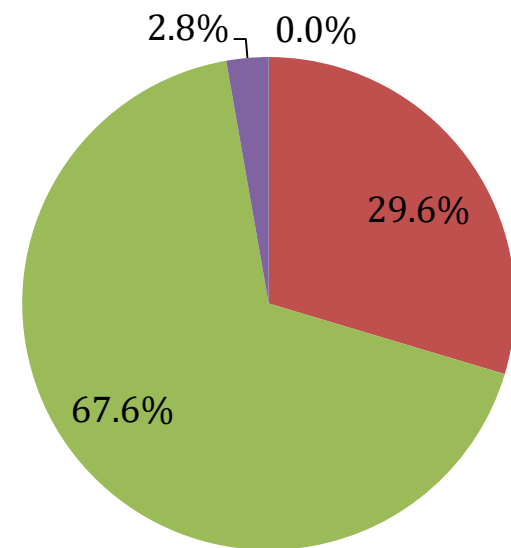
# Personal decrees to big HD fleets

- ▶ Directed to every fleet with more than 100 vehicles or 10 garbage trucks
- ▶ About 9,000 buses and 4,000 trucks affected
- ▶ Requirements:
  - Reduction of average PM emissions
  - Prohibition to use polluting vehicles (Euro III or lower)
  - Increasing alternative propulsion usage (electric, biodiesel, CNG):
    - 2016: 1%
    - 2018: 2%
    - 2020: 3%
- ▶ Buses:
  - ~ 400 retrofits on Euro III buses (up to 100% subsidies)
- ▶ Trucks:
  - ~ 100 retrofits on Euro III garbage trucks (up to 85% subsidies)

# Diesel Emission Regulations (2018)

- ▶ In force since November 2018
- ▶ Vehicles are categorized according to emission standards

Category	Engine type	Old heavy vehicle	Polluting vehicle	Regular vehicle	Low emission vehicle	Clean vehicle
		First registration in Israel				
		Until	Until	Between	From	
M1 private	All	-	-	Until 2014	2015	Zero emission vehicle
M1 other than private	CI	-	2004	From 2005 to 2014	2015	
	SI	-	-	From 2014		
N1	CI	-	2006	From 2007 to 2015	2016	
	SI	-	-	Until 2015		
N2	CI	-	2005	2006 to 2015	2016	
	SI	-	-			
M2, M3, N3	CI	2005	2005	2006 to 2012	2013	
M2, M3, N3	SI	-	-	Until 2012		
		-				
		-				



- Clean vehicle
- Low emission vehicle
- Regular vehicle
- Polluting vehicle



# Diesel Emission Regulations (2018)

- ▶ M2, M3, N3 diesel vehicles under Euro IV are required to install DPFs in order to renew their vehicle license - **About 13,000 vehicles**
- ▶ Polluting vehicles (diesel M1 [not private], N1, N2 vehicles under euro 4) will be marked with a sticker and ultimately, will not be allowed to enter low-emission zones
- ▶ Implementation is expected to reduce vehicular PM emissions by 30%

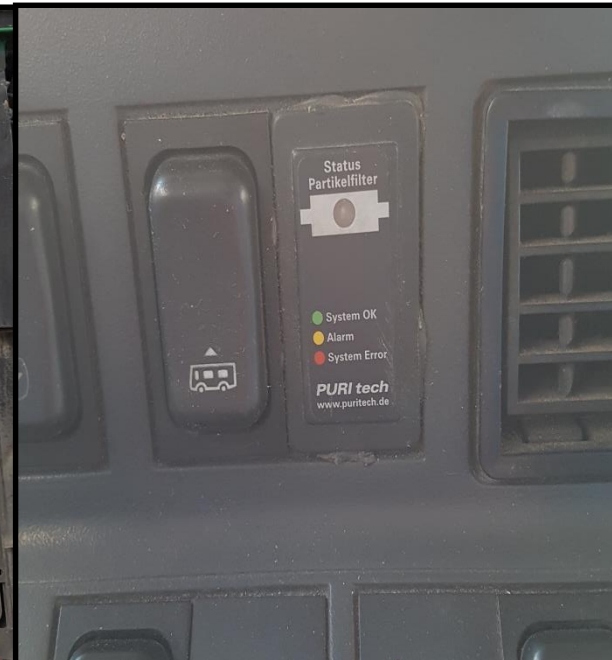


# Diesel Emission Regulations (2018)

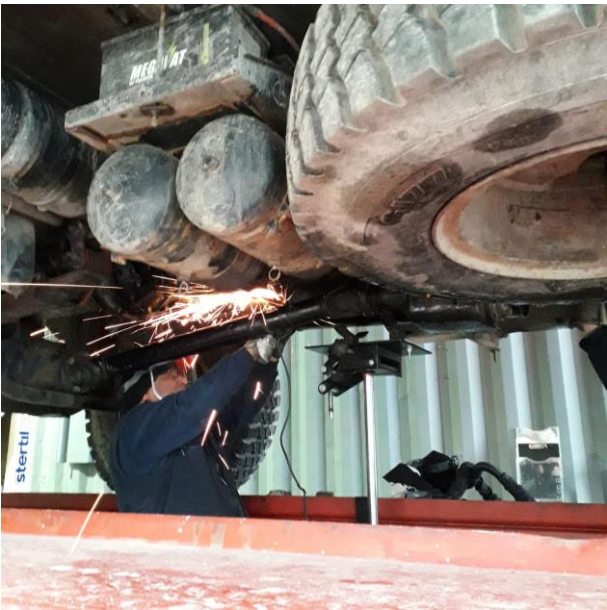
## Subsidies and Grants

- ▶ Scraping grants:
  - Up to 10,000 vehicles
- ▶ Retrofit subsidies: 50 – 100%
  - Up to 5,000 vehicles
  - Tenders for garages
  - Based on EU vehicle category
  - Price quote based on engine volume
- ▶ Total budget: 60 million €
- ▶ Status:
  - ~ 550 vehicles retrofitted
  - ~ 550 vehicles scraped

Scrapping Grants		
Vehicle Category	Registration Year	Grant
M2	Until 2000	~ 1,200 €
	2001-2005	~ 2,000 €
M3	Until 2000	~ 3,200 €
	2001-2005	~ 5,400 €
N3	Until 2000	~ 2,700 €
	2001-2005	~ 5,400 €









# Reduction of emissions from trains

- ▶ Rail in Israel: based on diesel
- ▶ 95 locomotives with 2 stroke EMD engines 2,000 – 3,000 kW (older: not homologated / newer: Tier 2)
- ▶ 160 diesel 4 stroke 300-340kW CAT power generators
- ▶ Poor air quality in platforms (especially at closed stations)
- ▶ High PN concentrations inside passenger wagons



# Reduction of emissions from trains

- ▶ Stricter emission limits for locomotives
- ▶ Electrification
  - 2018- First line (Jerusalem-Airport)
  - Other lines will follow





# Reduction of emissions from trains

- ▶ DPF retrofit for all 160 power generators

No DPF

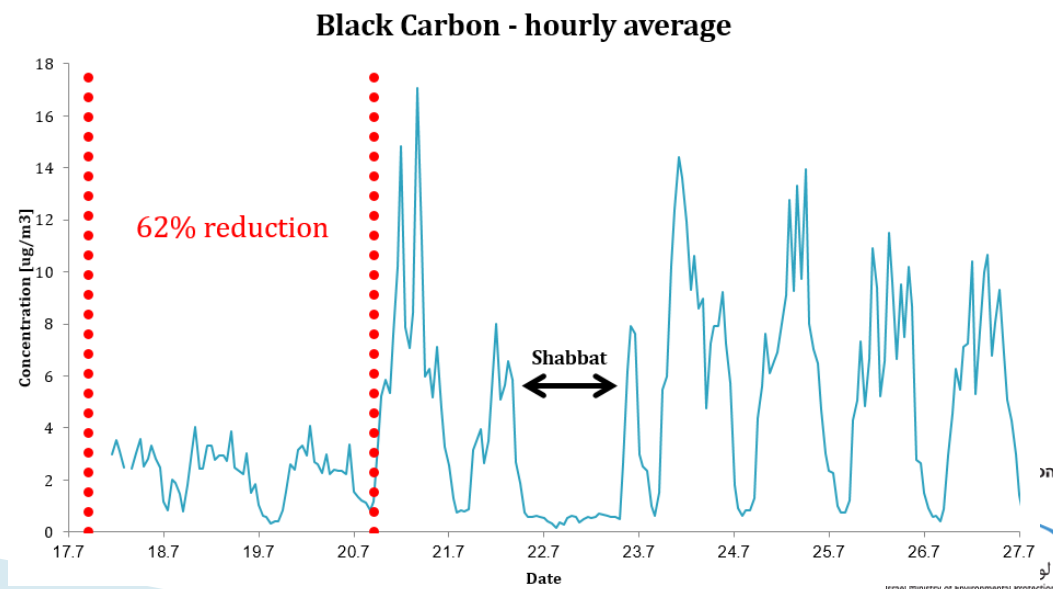


With DPF



# Jerusalem Central Bus Station

- ▶ 1000 departures per day
- ▶ Boarding at closed space without natural ventilation
- ▶ Euro III (DPF retrofitted) to VI buses
- ▶ Euro VI Experiment:
  - 62% reduction in BC
  - 78% reduction in NO



# **Future activities**



# Next challenges:

- ▶ NRMM
- ▶ Additional LEZ
- ▶ NPTI



# Thank you!

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