NON-EXHAUST PARTICULATE EMISSIONS FROM ROAD TRANSPORT:

AN IGNORED ENVIRONMENTAL POLICY CHALLENGE

Authors:
Fulvio Amato, Institute of Environmental Assessment and Water Research (IDÆA) and the Spanish National Research Council (CSIC)
Alexandros Dimitropoulous, PBL Netherlands Environmental Assessment Agency
Katherine Farrow, OECD Environment Directorate
Walid Oueslati, OECD Environment Directorate

EU Green Week Partner Event, 3 June 2021

OECD
BETTER POLICIES FOR BETTER LIVES

Non-exhaust Particulate Emissions from Road Transport

Key messages of the report:

1. Exposure to non-exhaust PM is associated with adverse health impacts

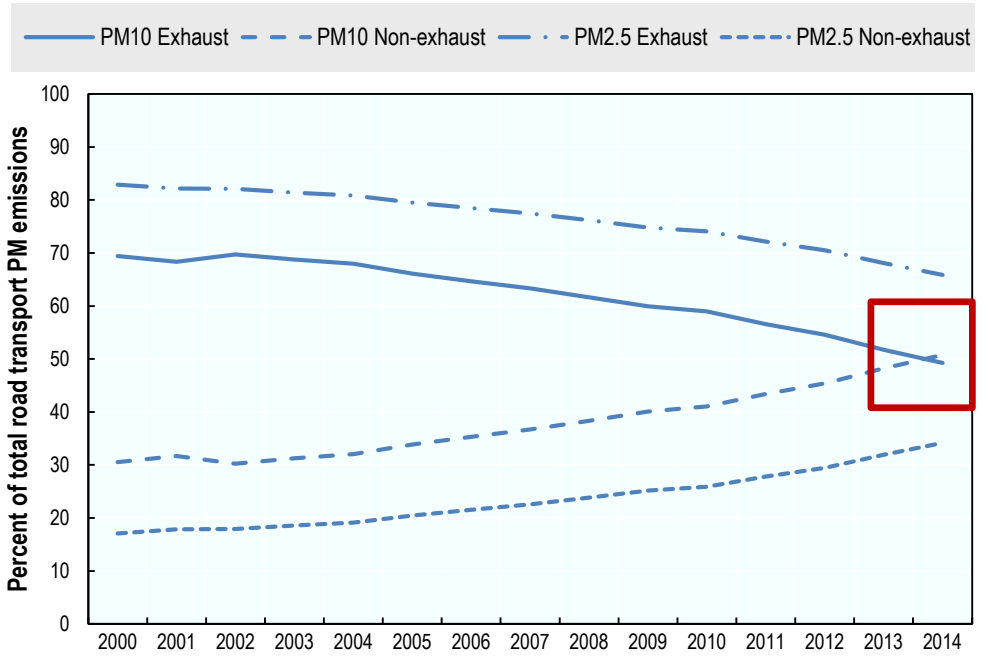
2. EVs emit less PM overall, but may emit more non-exhaust PM and shift the composition of PM towards tyre wear

3. Policies should explicitly target non-exhaust emissions, and EVs should be included

The growing importance of non-exhaust emissions

- Emissions standards have led to a decrease in PM from exhaust emissions over the years, but not in PM from non-exhaust sources

Exhaust vs. non-exhaust wear PM emissions in the EU



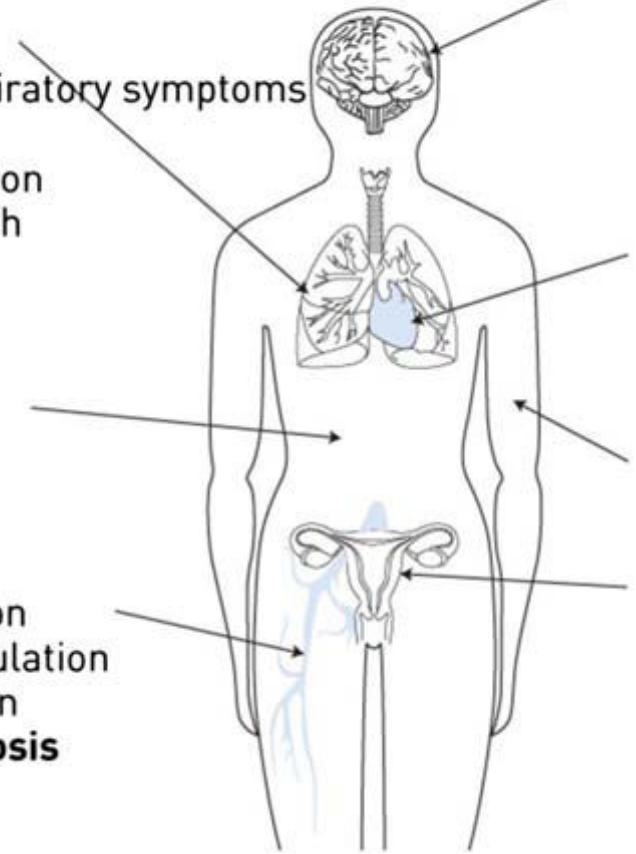
Note: Road dust resuspension not included.
Source: CEIP, 2019 (www.ceip.at)

1. Health effects of PM emissions

Respiratory disease mortality
Respiratory disease morbidity
Lung cancer
Pneumonia
Upper and lower respiratory symptoms
Airway inflammation
Decreased lung function
Decreased lung growth

Insulin resistance
Type 2 diabetes
Type 1 diabetes
Bone metabolism

High blood pressure
Endothelial dysfunction
Increased blood coagulation
Systemic inflammation
Deep venous thrombosis



Stroke
Neurological development
Mental health
Neurodegenerative diseases

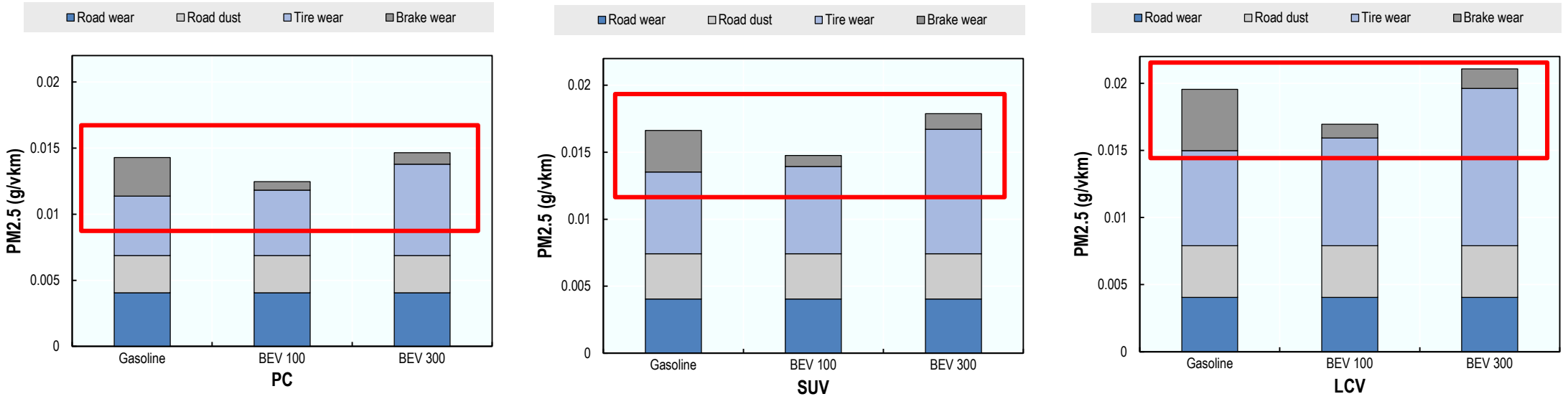
Cardiovascular disease mortality
Cardiovascular disease morbidity
Myocardial infarction
Arrhythmia
Congestive heart failure
Changes in heart rate variability
ST-segment depression

Skin ageing

Premature birth
Decreased birthweight
Decreased fetal growth
Intrauterine growth retardation
Decreased sperm quality
Pre-eclampsia

European Respiratory Journal
Jan 2017, 49 (1) 1600419; DOI: 10.1183/13993003.00419-2016.

2. Non-exhaust PM emission factors



1. EVs shift the composition of non-exhaust PM from brake wear to tyre wear
2. Heavyweight EVs may emit more non-exhaust PM2.5 than lighter weight EVs.

Policy responses

International	• Prioritise **research and development** • Establish recognised **measurement methods** for non-exhaust PM • Consider development of **emission standards** for non-exhaust PM; do not exclude EVs
National	• Promote **vehicle lightweighting** • **Regulate hazardous content** of tyres and brakes • **Invest in R&D** for mitigation technologies
Local	• Extend the use of **vehicle restrictions** • Implement **management measures** to reduce emission potential

THANK YOU

Access the report: oe.cd/non-exhaust