



NON-EXHAUST PARTICULATE EMISSIONS FROM ROAD TRANSPORT: AN IGNORED ENVIRONMENTAL POLICY CHALLENGE

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Non-exhaust Particulate Emissions from Road Transport

Key messages of the report:

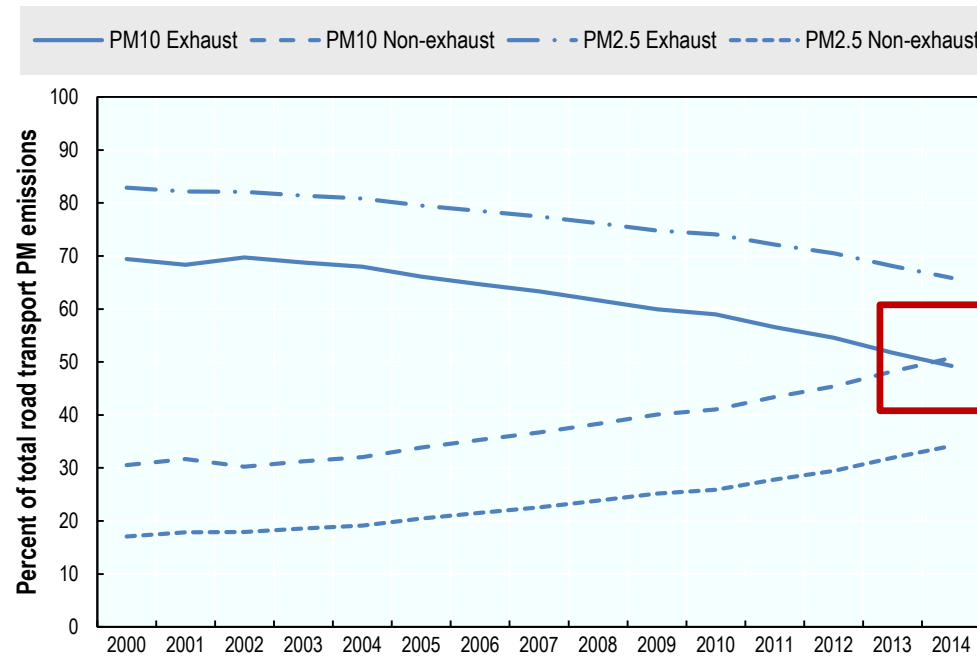
1. Exposure to non-exhaust PM is associated with adverse health impacts
2. EVs emit less PM overall, but may emit more non-exhaust PM and shift the composition of PM towards tyre wear
3. Policies should explicitly target non-exhaust emissions, and EVs should be included



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)



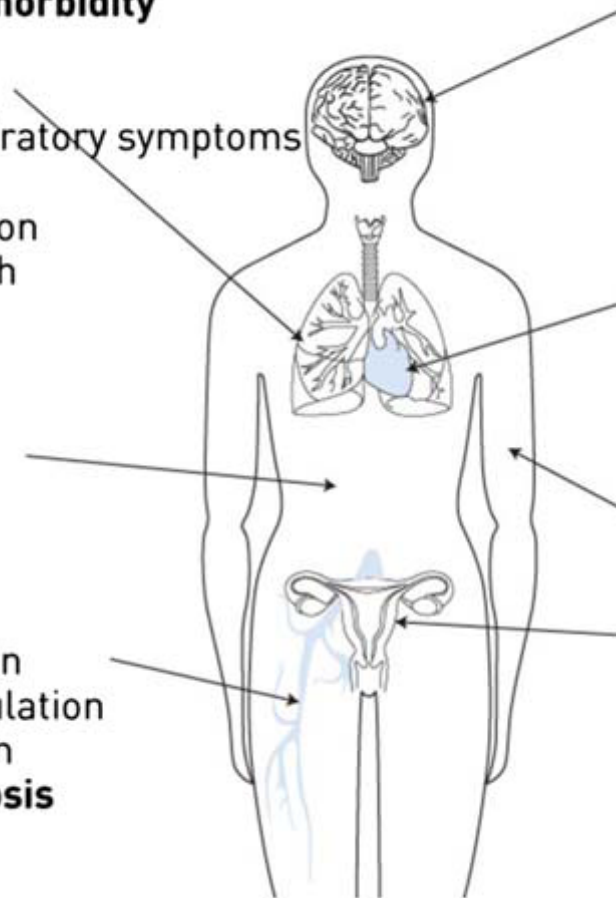
1. Health effects of PM emissions

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

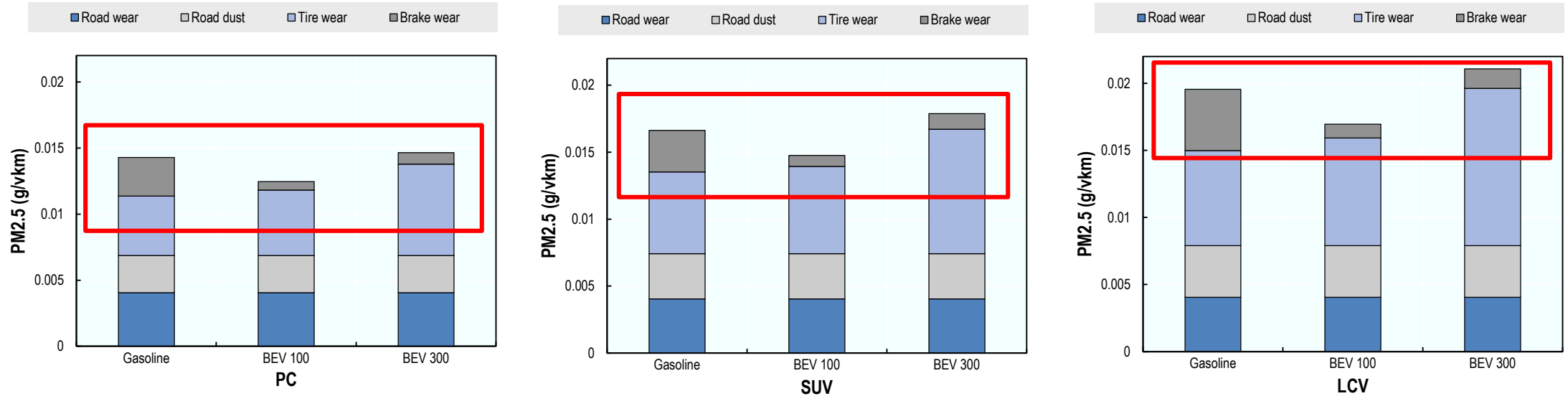
Premature birth

Decreased birthweight

Decreased fetal growth
Intrauterine growth retardation
Decreased sperm quality
Pre-eclampsia



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 PM_{2.5} 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

