

BEYOND THE TAILPIPE: **ADVANCING RESEARCH ON BRAKE AND TIRE- ROAD WEAR EMISSIONS**

ABOUT THE CONSORTIUM

The Non-Exhaust Emissions Consortium (NEEC) is dedicated to advancing the understanding of brake wear and tire-road wear emissions from mobile sources. Through independent broad-based research conducted at the University of California Riverside (UCR) College of Engineering, Center for Environmental Research and Technology (CE-CERT), NEEC provides stakeholders with industry-leading insights into non-exhaust particulate matter (PM) emissions.

NEEC is a broad research focused collaboration supported by automotive, tire manufacturing, braking systems, and brake component suppliers. Inspired by CE-CERT's extensive experience in non-exhaust emissions research, NEEC aims to unite academia, government, and industry to address broad research needs. Our charter, guided by industry members, is conducted by CECERT faculty and students, with projects typically spanning one to two years.

OUR MISSION

NEEC is committed to enhancing the understanding of non-exhaust emissions by bridging research, policy, and real-world applications. CE-CERT's leadership ensures scientific rigor and integrity, industry engagement ensures the integration of the automotive supply chain, and NEEC provides an impartial framework for research that academic institutions, regulatory agencies, and industry stakeholders can trust.

WHY NON-EXHAUST EMISSIONS?

Non-exhaust emissions represent an often-overlooked air quality challenge. Unlike tailpipe emissions, which are increasingly regulated, non-exhaust emissions remain largely uncontrolled. These emissions contribute to air pollution, which may have unknown effects on the environment and human health. With stricter regulations targeting vehicle exhaust, non-exhaust sources are becoming the dominant contributor to road transport-related PM emissions.

PARTNERING FOR PROGRESS

ADVANCING SCIENCE, SHAPING POLICY, DRIVING INDUSTRY INNOVATION

RESEARCH FOCUS AREAS

NEEC collaborates with industry and scientists to develop data-driven solutions for non-exhaust emissions.

Our research priorities include:

- **Advanced Sampling Systems**
Designing and validating onboard measurement systems for real-world measurements.
- **Standardized Testing Protocols**
Establishing or validating industry-accepted measurement methods and associated technologies.
- **Emission Characterization**
Analyzing the composition and source of non-exhaust emissions, including brake and tire-road wear particles.
- **Material & Road Impact Studies**
Evaluating how brake and friction materials, tire selection, driving behavior, and road conditions influence emissions.
- **Vehicle Technology & Vocation**
Investigating the impacts of battery electric light- and heavy-duty vehicles on non-exhaust emissions.
- **Regulatory & Policy Insights**
Providing a platform to showcase scientific research on non-exhaust emissions.

BECOME A MEMBER

Joining NEEC allows you to advance non-exhaust emissions research. Membership fees are pooled to fund projects, ensuring cost-efficient, high-impact broad-based research aligned with industry priorities.

The annual membership fee is \$25,000.

MEMBER BENEFITS

- ✓ **Guide Research Priorities**
Shape NEEC projects through the NEEC Leadership Council.
- ✓ **Early Access to Findings**
Receive real-time research data to support compliance and technology development and deployment.
- ✓ **Regulatory & Policy Insights**
Stay informed on emerging emissions regulations in the U.S., Europe, China, South Korea, Japan, and India.
- ✓ **Cost-Effective R&D**
Leverage shared funding for high-impact, industry-guided research.
- ✓ **Facility Access**
Facilitated utilization of CE-CERT's labs and state-of-the-art testing equipment.
- Industry Collaboration**
 - ✓ Fostering collaborative engagement/knowledge sharing with industry engineers and CE-CERT faculty.
- Talent Development**
 - ✓ Connect with skilled students for internships and future hiring.