The Dieselgate Scandal – What happened, why it matters, and what's next.

Francisco Posada, Drew Kodjak

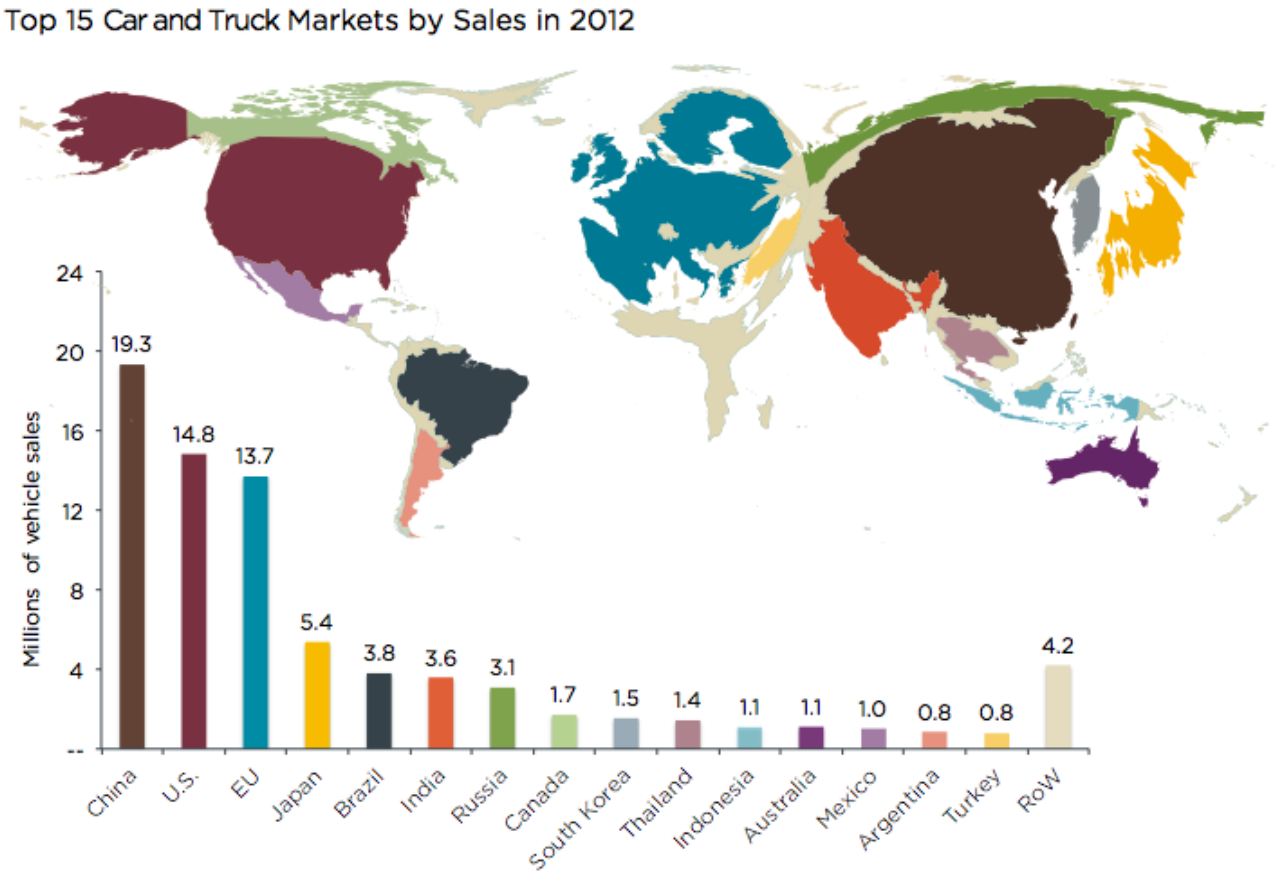
National Association of Clean Air Agencies Annual Meeting, May 17, 2016
Santa Fe, NM

icct
THE INTERNATIONAL COUNCIL ON CLEAN TRANSPORTATION

ICCT's mission is to dramatically improve the environmental performance and efficiency of motor vehicles

- International Council is composed of government regulators in top vehicle markets.
- Funding: US-based philanthropies (Hewlett, Climate Works) plus government contracts.

- We are 40 staff, 15 nationalities, 90% program staff with advanced degrees
- Offices in DC, San Francisco, Berlin and Beijing.



icct
THE INTERNATIONAL COUNCIL ON CLEAN TRANSPORTATION

Overview

- Why do we care?
- The VW story
- European reaction
- What US states can do?
- What's next?

icct
THE INTERNATIONAL COUNCIL ON CLEAN TRANSPORTATION

Pollution

Diesel engine pollution linked to early deaths and costs NHS billions

Environmental experts warn high percentage of diesel engines in public transport may cause quarter of all air pollution deaths

John Vidal

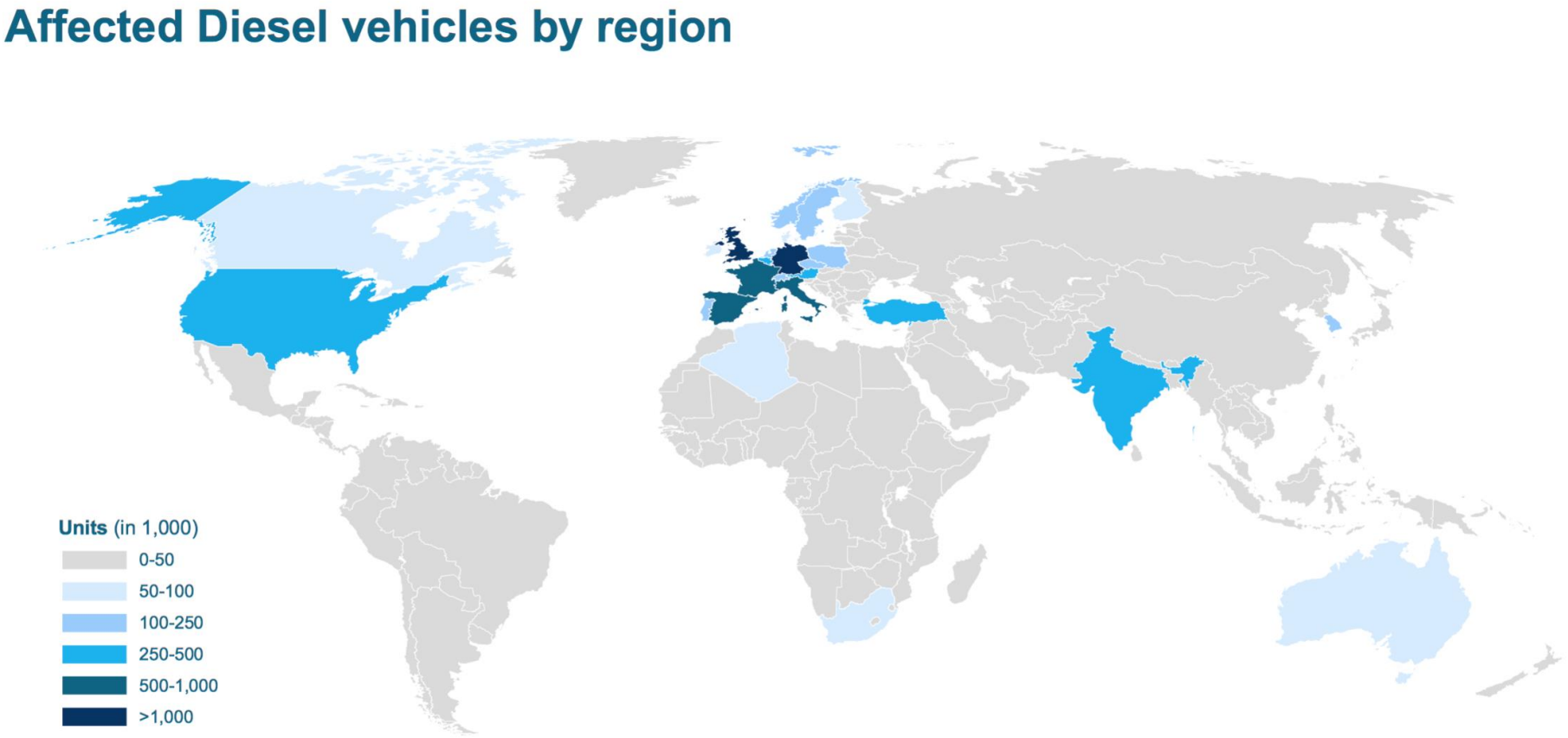
Tuesday 29 April 2014
11.40 EDT

With government figures for 2008 showing 29,000 people dying prematurely from air pollution each year, diesel fuel burned in vehicles could be responsible for around one in four of all air pollution deaths…

icct
THE INTERNATIONAL COUNCIL ON CLEAN TRANSPORTATION

http://www.theguardian.com/environment/2014/apr/29/diesel-engine-pollution-premature-deaths-costs-nhs-billions

MIT/Harvard estimated 59 deaths and $450 MM lost due to Dieselgate ICCT is studying European and global health impacts of VW Dieselgate

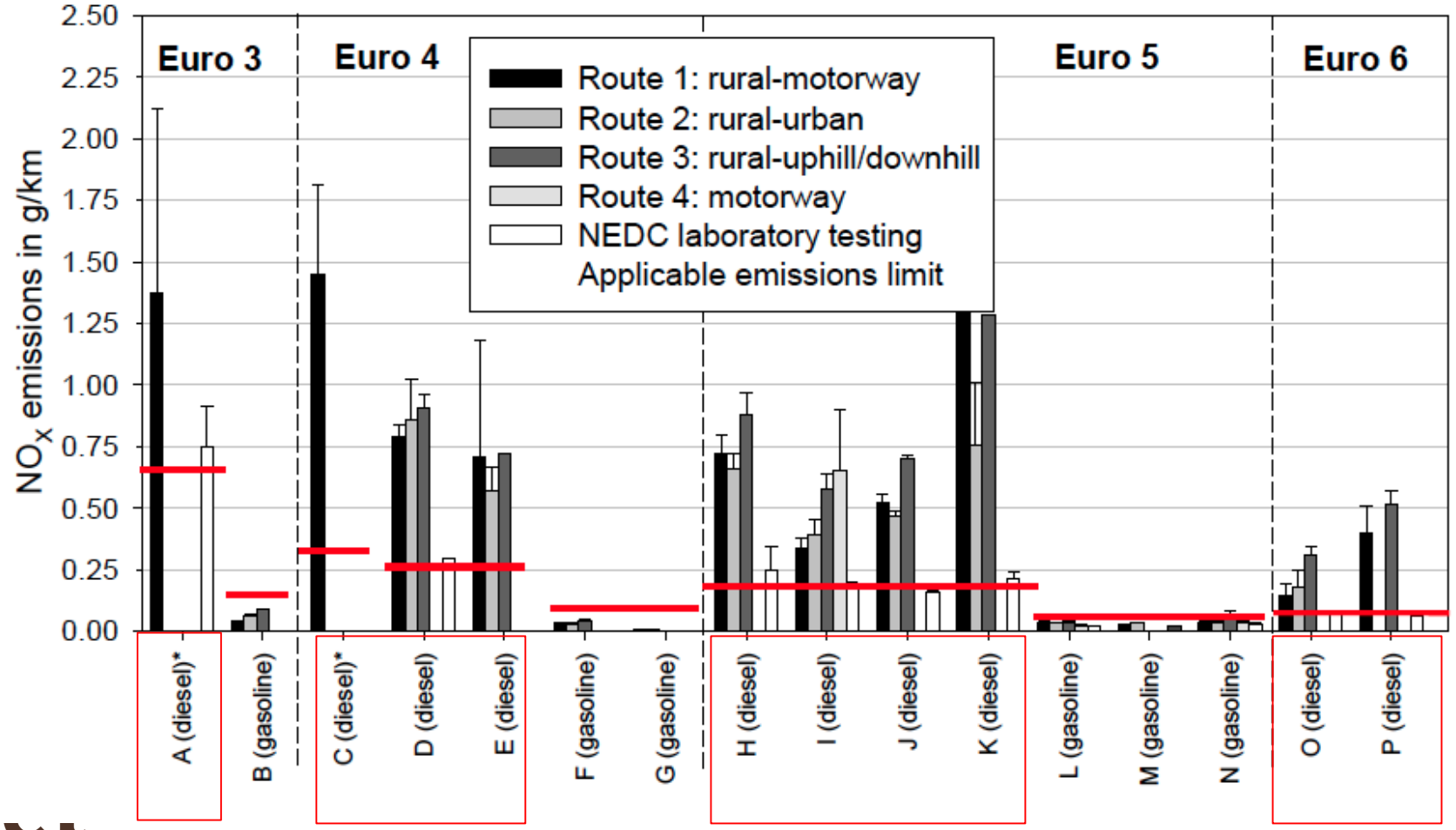


icct
THE INTERNATIONAL COUNCIL ON CLEAN TRANSPORTATION

http://www.volkswagenag.com/content/vwcorp/info_center/en/talks_and_presentations/2015/10/Presentation_Q3.bin.html/binarystorageitem/file/2015-10-28+Presentation+9M+2015_WEBSITE.pdf

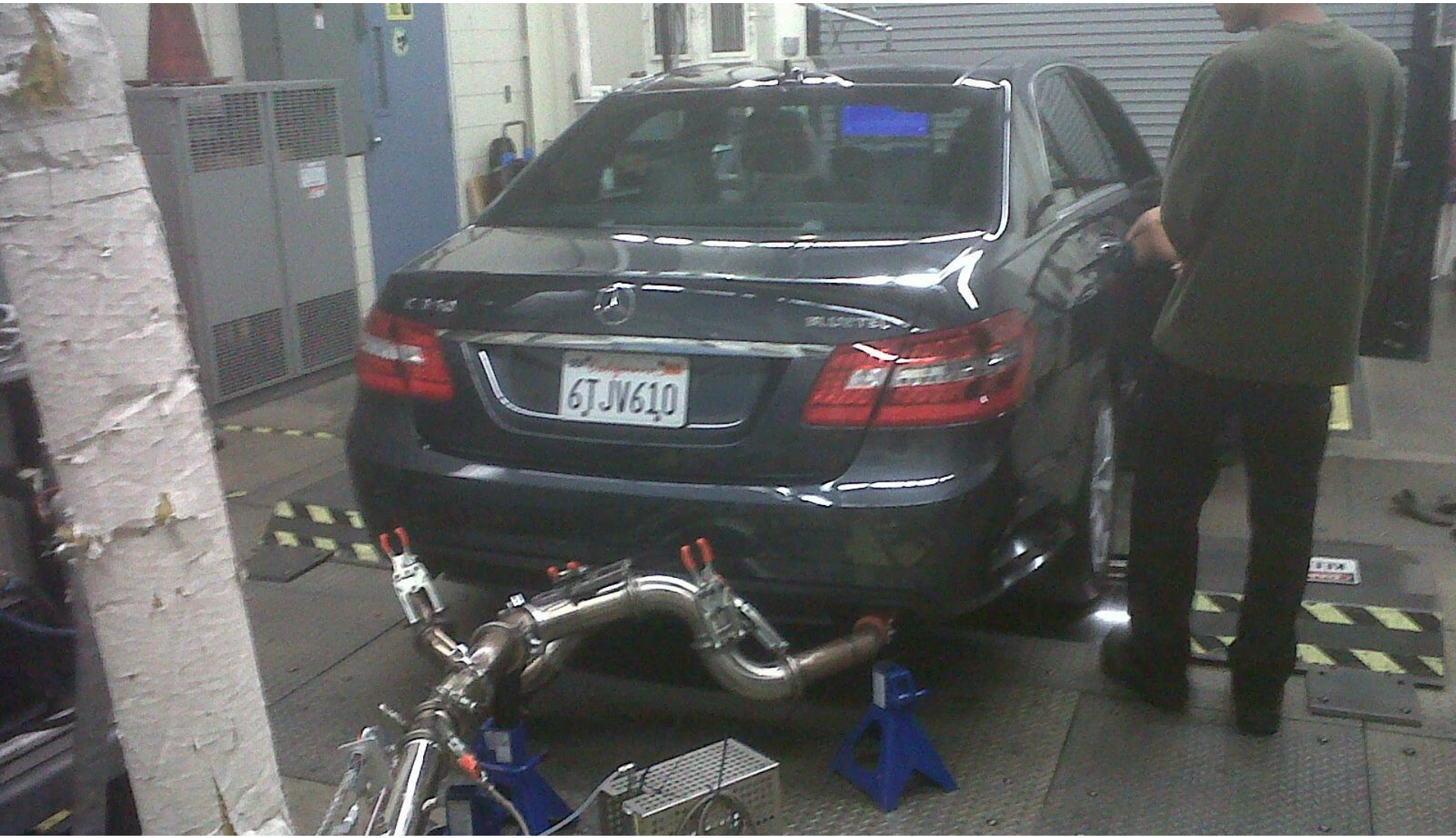
Our motivation: in 2011 an European PEMS study showed that real world NOx emissions from diesels were 2x-7x more than the standard limits

JRC Data, 2011- EU



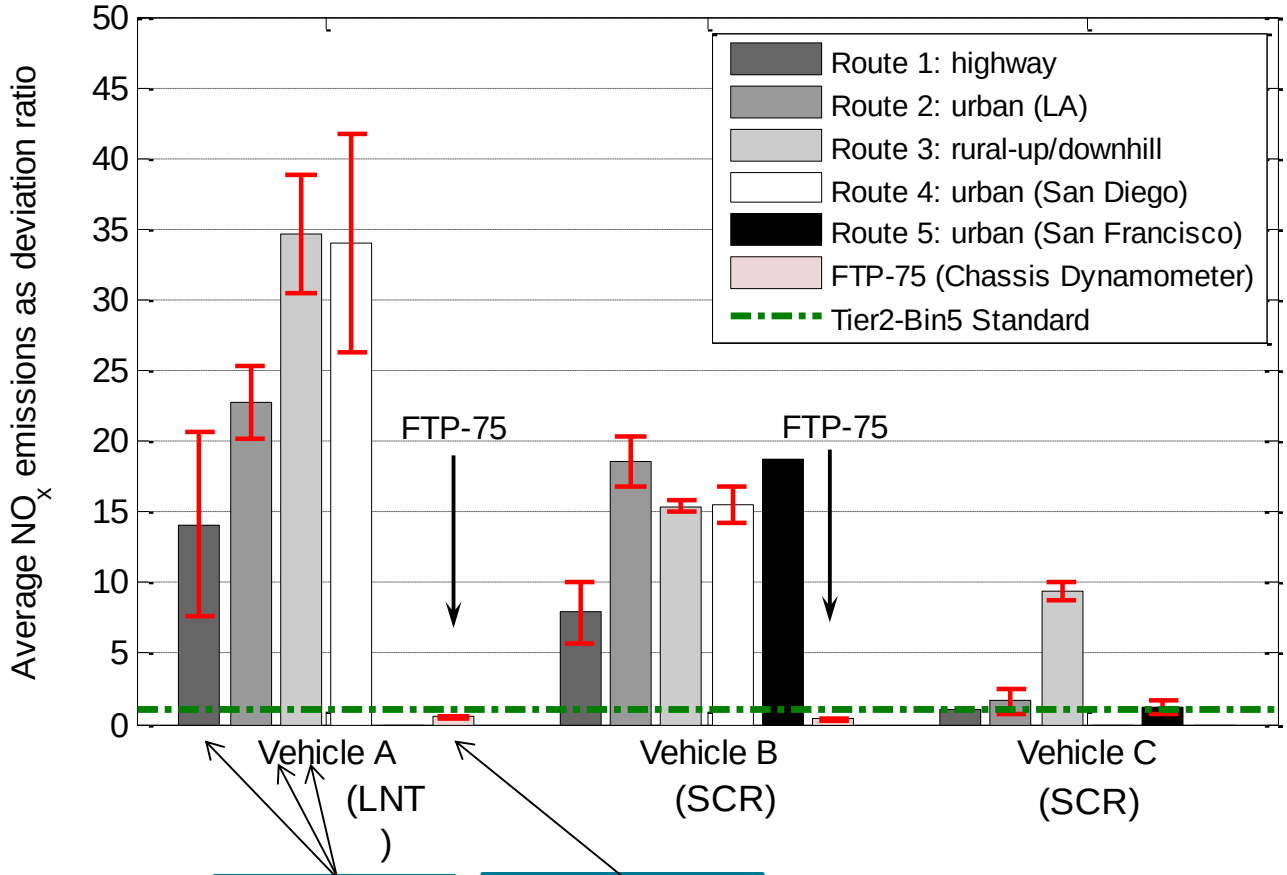
Weiss et al. 2011. JRC

We asked CARB for access to laboratory testing (for benchmarking)



and hired WVU to perform in-use testing with PEMS

US PEMS Route NOx emissions and CARB chassis results



Vehicle A (VW Jetta):

Vehicle A (VW Jetta): **15-35 times** higher than the FTP standard,

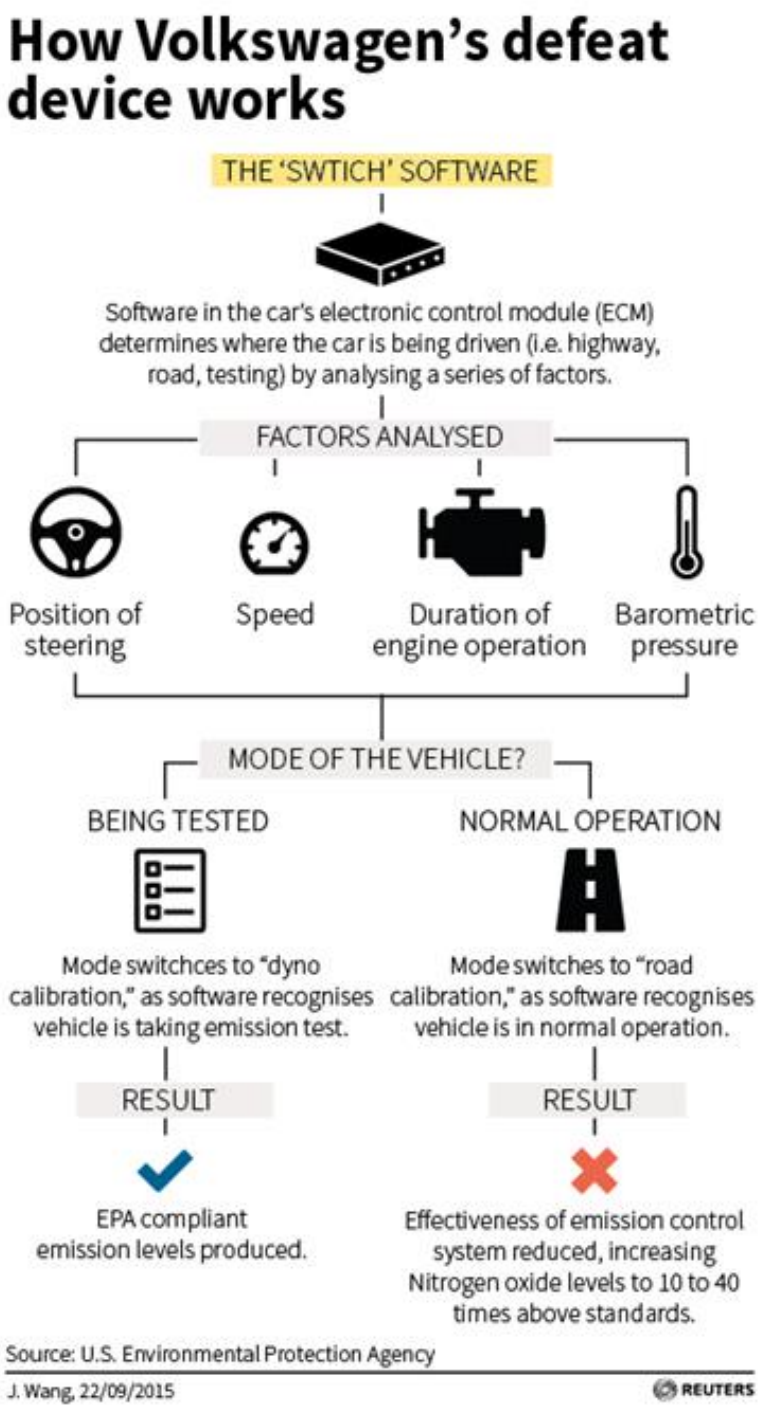
Vehicle B (VW Passat) : **5-18 times** higher than FTP standards,

Vehicle C (BMW X5): generally at or below the FTP standard.

NO_x std. FTP-75: 0.044 g/km

icct
THE INTERNATIONAL COUNCIL ON CLEAN TRANSPORTATION

http://www.theicct.org/use-emissions-testing-light-duty-diesel-vehicles-us

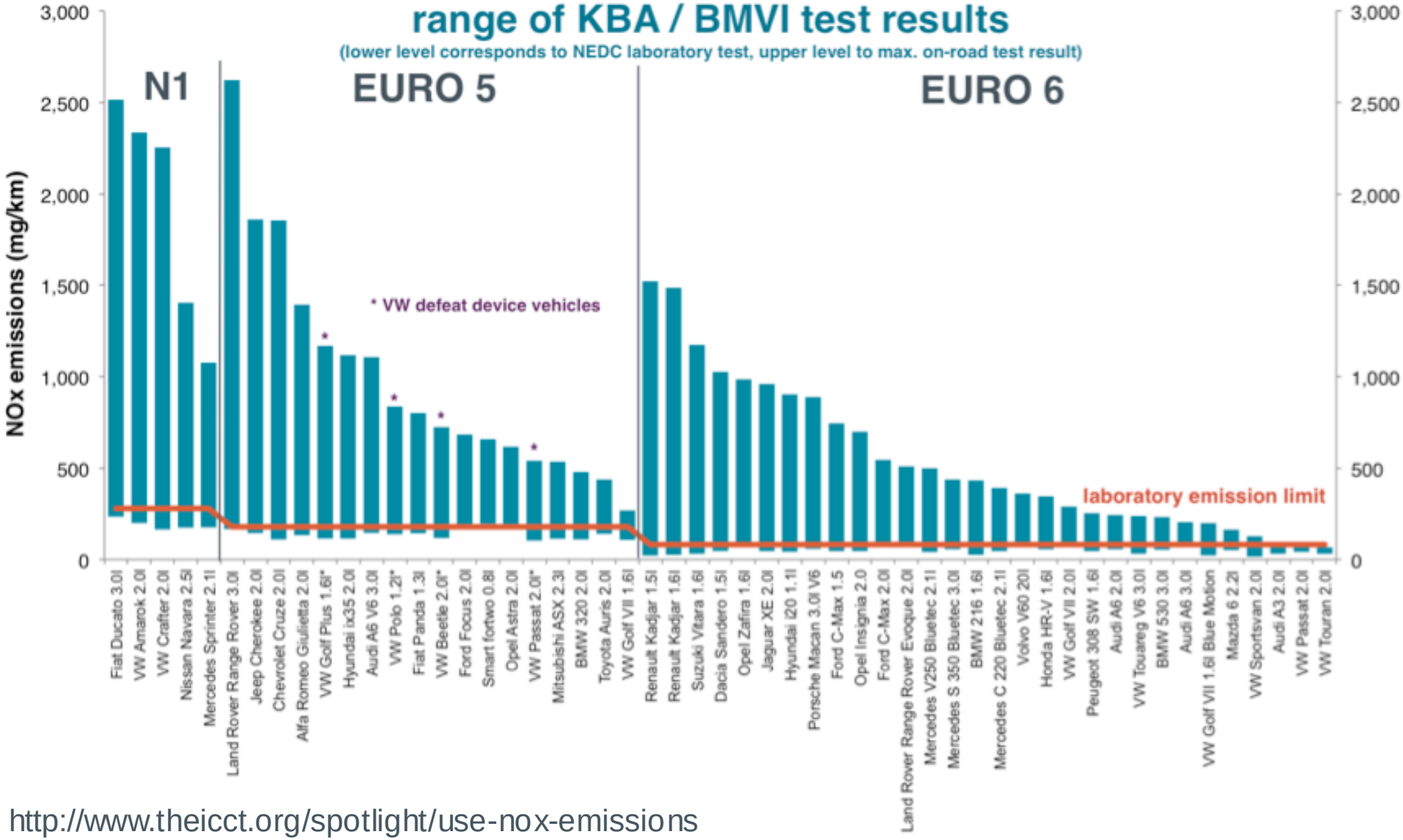


The VW defeat device case is a reminder of the importance of **strong in-use compliance and enforcement programs**.

This compliance challenge applies to **real world emissions** of all manufacturers, pollutants, light and heavy-duty vehicles, and diesel and petrol vehicles.

*http://www.theicct.org/future-of-vehicle-testing

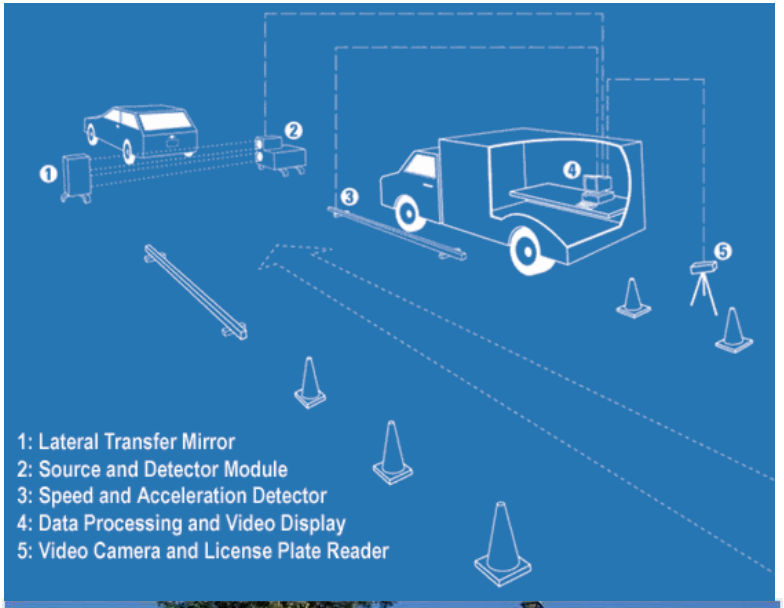
UK, French and German vehicle tests show that excess emissions problem in Europe applies to nearly all car makers

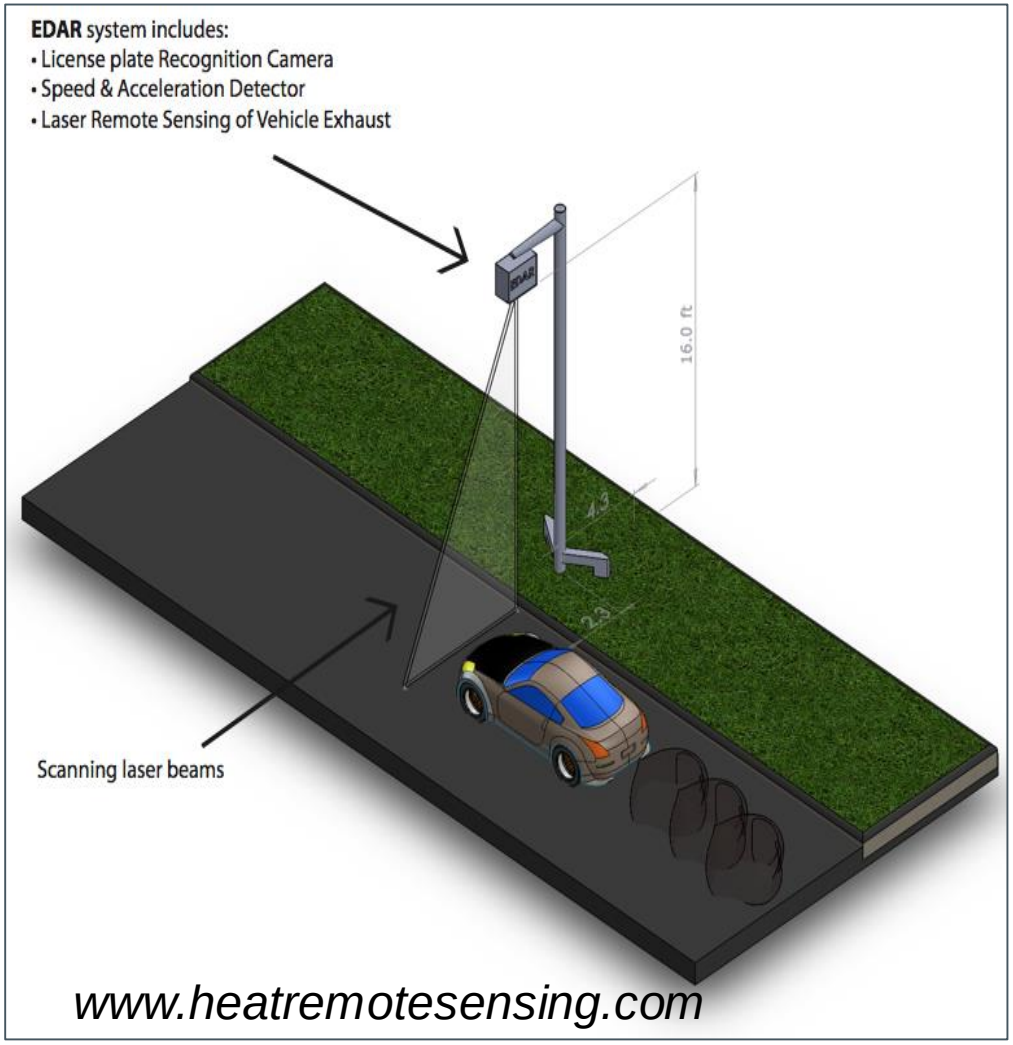


http://www.theicct.org/spotlight/use-nox-emissions

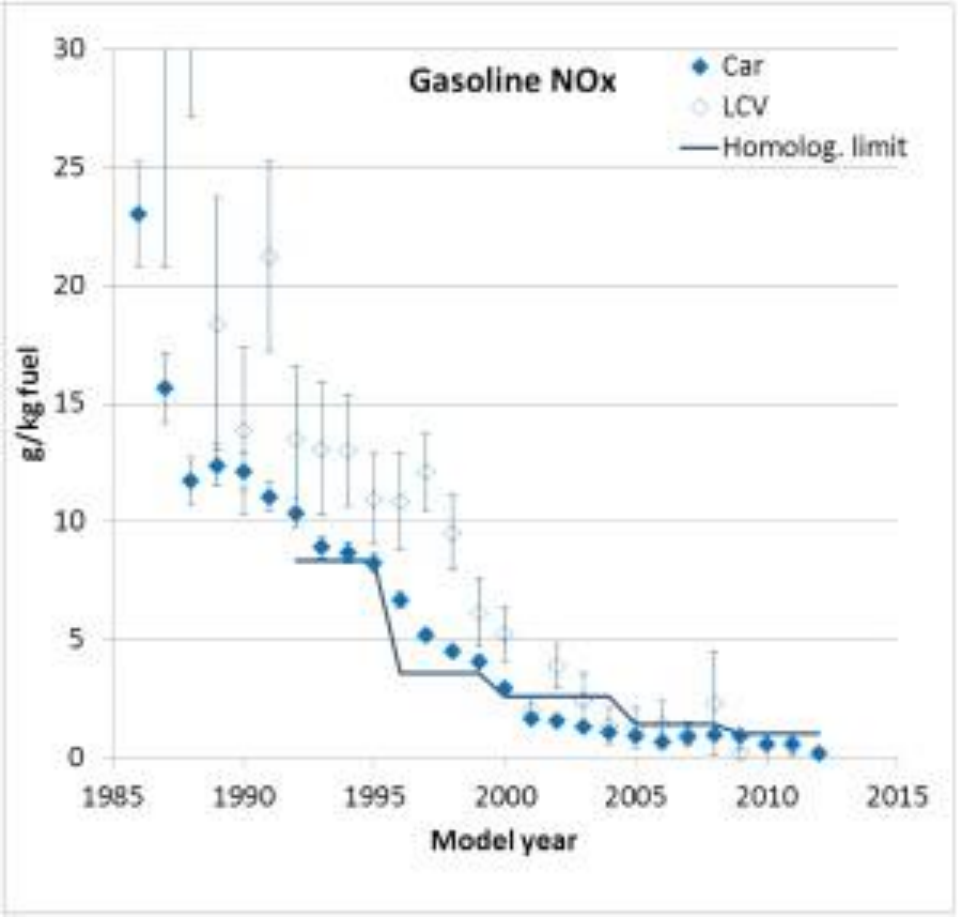
What US states can do?

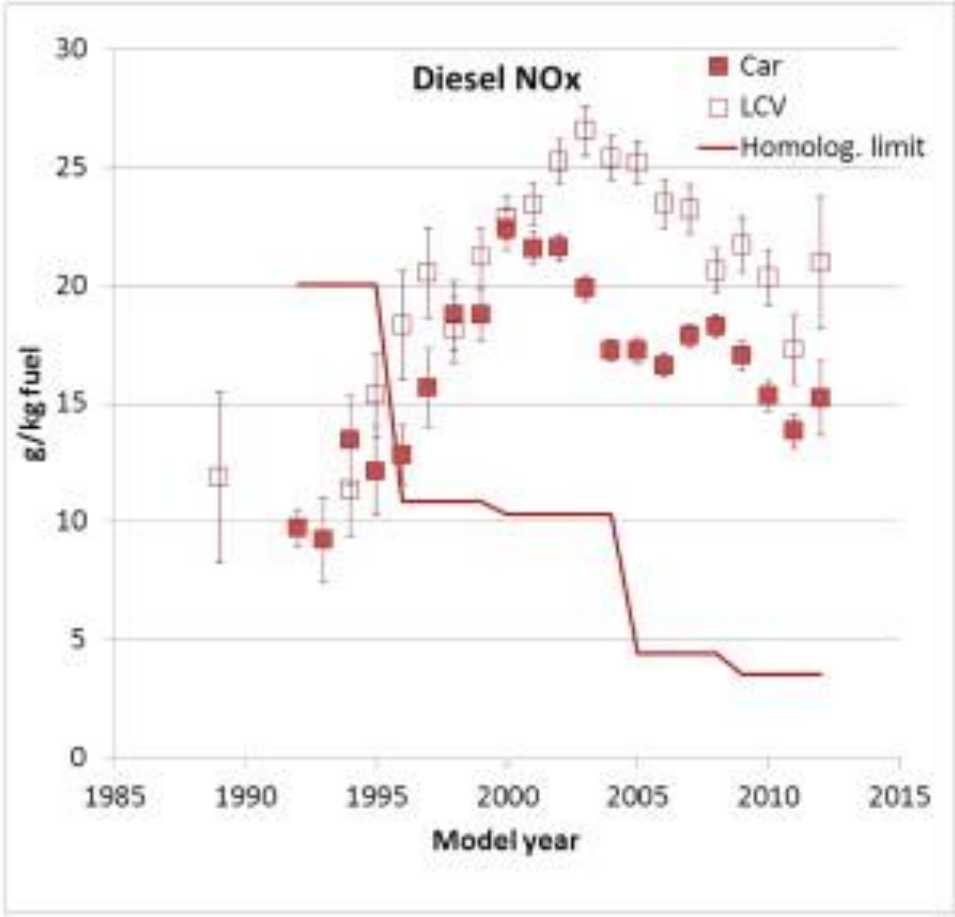
- Adopting **remote sensing** programs to keep track of fleet emissions performance





Remote sensing data from Zurich demonstrates that in-use emissions from diesel cars are not following the trends set by the standards – gasoline cars are doing it





icct
THE INTERNATIONAL COUNCIL ON CLEAN TRANSPORTATION

Chen & Borken-Kleefeld, Real-driving emissions from cars and light commercial vehicles - Results from 13 years remote sensing at Zurich/CH Atmospheric Environment, 88:157-164 (May 2014)

What US states can do?

- Revamping Inspection and Maintenance (I/M) programs
  - OBD data to track vehicle performance – Expand requirements
  - LDV – Technology is evolving, I/M should adapt to it.
  - HDV – almost non-existent - CA is leading this effort

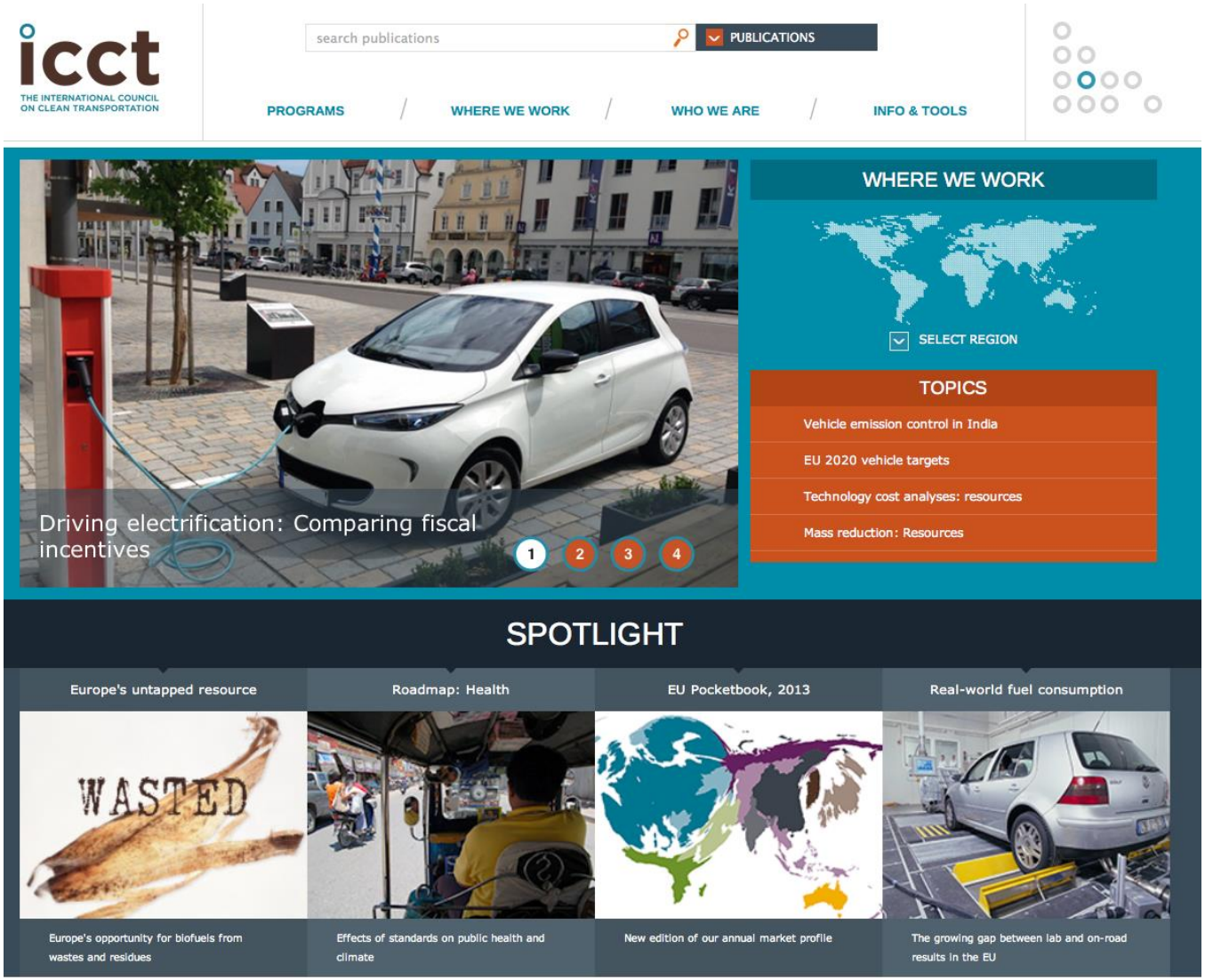
- **Share RSD and I/M data with EPA and ARB**

icct
THE INTERNATIONAL COUNCIL ON CLEAN TRANSPORTATION

What is next?

- ICCT continues research activities: testing, data gathering and analysis
- Publishing analysis - Transparency
- Developing guidelines for vehicle testing and defeat device screening
- International workshops – sharing lessons learned

Thank you!



Francisco Posada
francisco@theicct.org
www.theicct.org

BACKGROUND SLIDES

icct
THE INTERNATIONAL COUNCIL ON CLEAN TRANSPORTATION

Background and Additional Reading

- http://www.theicct.org/news/epas-notice-violation-clean-air-act-volkswagen-press-statement
- http://theicct.org/news/faq-use-nox-emissions-diesel-passenger-cars
- http://www.theicct.org/position-brief-oct2015-policy-solutions-real-world-emissions
- http://www.theicct.org/future-of-vehicle-testing
- http://www.theicct.org/european-real-driving-emissions-regulation
- http://www.theicct.org/blogs/staff/miseducation-diesel-car
- http://www.theicct.org/nox-control-technologies-euro-6-diesel-passenger-cars
- http://www.theicct.org/laboratory-road-2015-update

Europe's RDE-LDV process

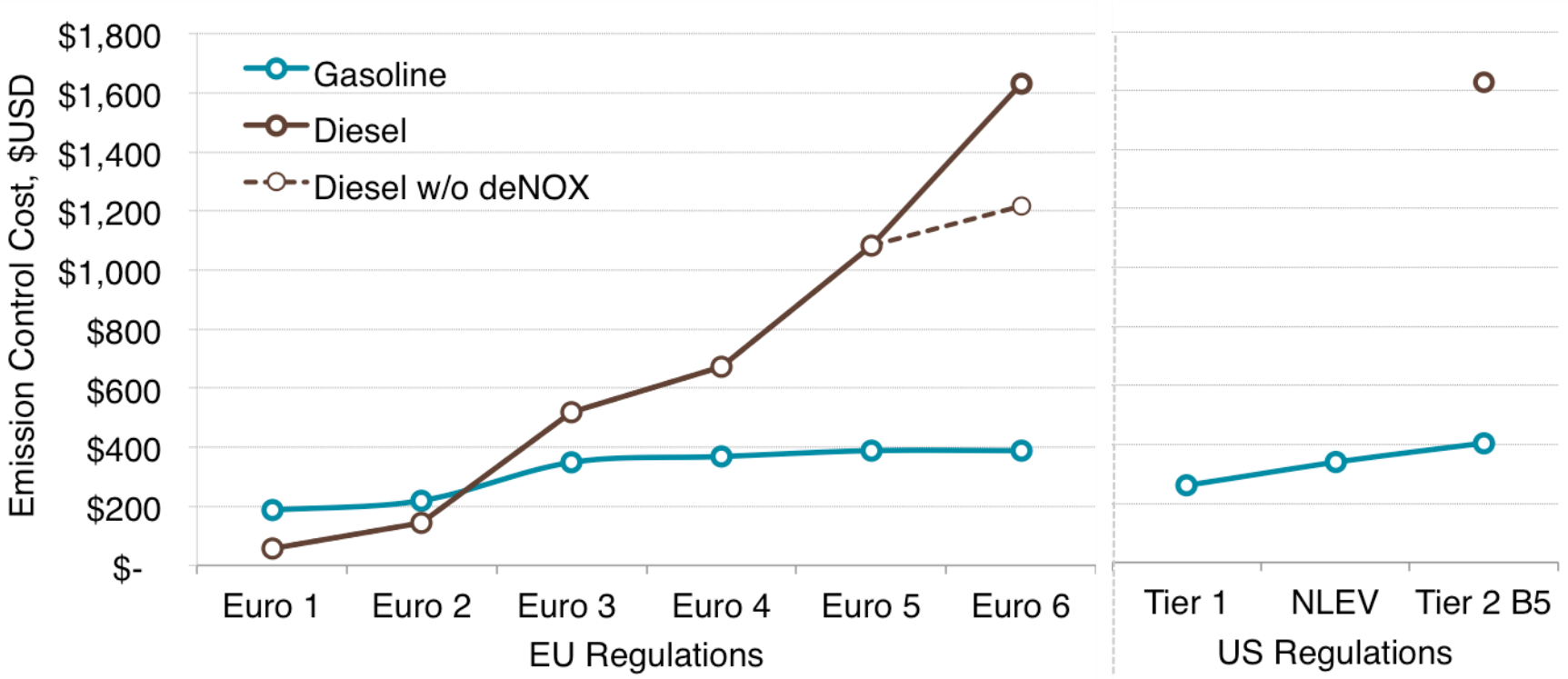
What is it?

- An amendment to Euro 6 standards to make on-board (PEMS) testing **part of type-approval**. Triggered by high on-road Diesel NO_X results
- Stakeholder working group is trying to define how the tests should be conducted (boundary conditions), how the data should be analyzed and reported
- Pilot phase to start in 2015, implementation in 2017
- Driver of changes in Diesel NO_X aftertreatment; implications on small Diesel PC market

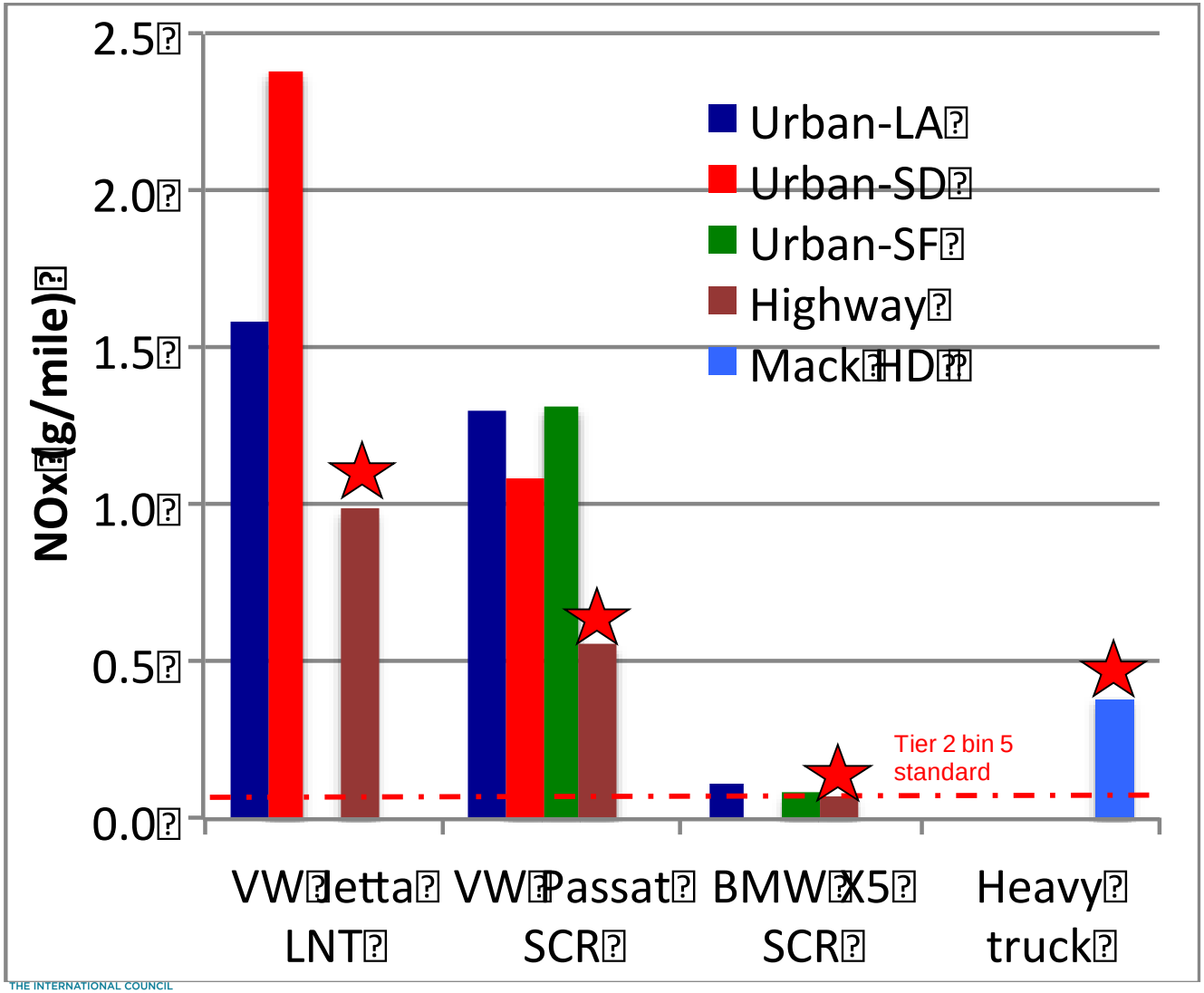
icct
THE INTERNATIONAL COUNCIL ON CLEAN TRANSPORTATION

Estimated cost of emission control technologies for LDVs

- Estimated direct manufacturing emission control technology cost for gasoline and diesel LDVs assuming a 2.0 L engine



Compare to HDDV Route NOx emissions (total distance/total NOx)



- Lowest NO_x during highway driving
- **When compared to a 2011 Mack truck loaded to 67,000 GVW:**
  - **Highway NOx from VW Passat are 1.4 times higher**
  - **Highway NOx from VW Jetta are 2.6 times higher**