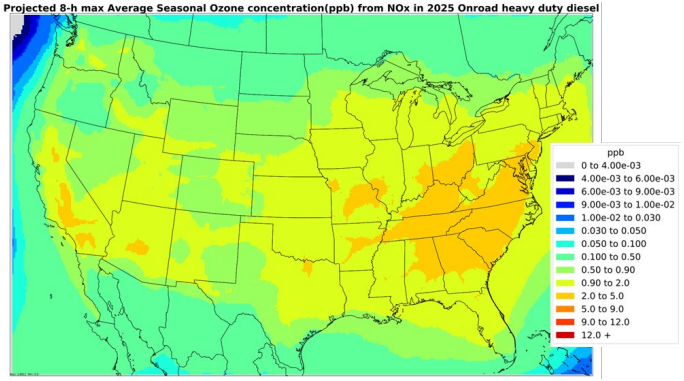
EPA's Cleaner Trucks Initiative—

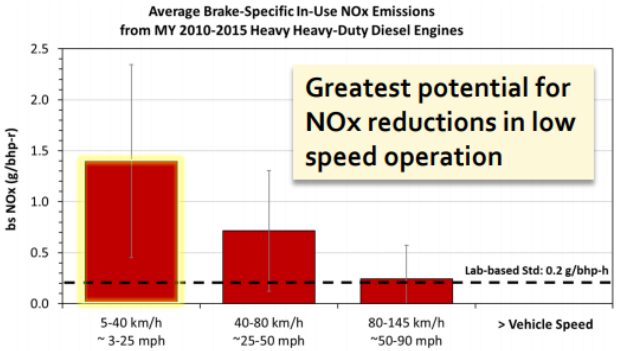
Overview of Advance Notice of Proposed Rule (ANPR)

EPA's Cleaner Trucks Initiative (CTI)—Need for Action

- EPA last revised NOx standards for heavy-duty trucks nearly 20 years ago
- Current emissions standards have lowered overall NOx emissions, but have not resulted in effective control under low-load conditions
  - By addressing low-load operation, we can improve NOx emission controls in cities and in areas of high traffic, making a big difference to communities
  - But also looking for additional opportunities for NOx reductions at mid-to-high load due to technology improvements
- The Advance Notice of Proposed Rule (ANPR) is the first step to modernize the requirements to better reflect the capability of available emissions control technologies



Data from 93 vehicles; all engines certified to 0.2 g/bhp-h in pre-production lab tests



CTI ANPR—Timeline and Goals

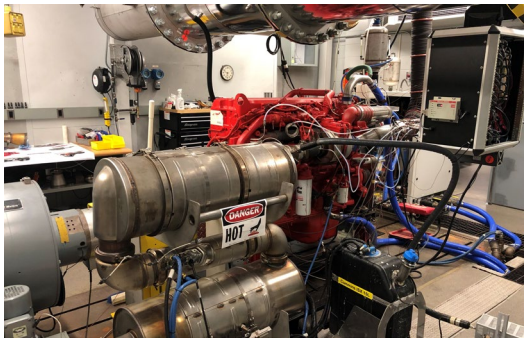
- ANPR was signed by Administrator Wheeler on January 6, 2020
- Published in Federal Register on January 21, 2020
- 30-day comment period ends on February 20, 2020
- The ANPR presents the goals of the CTI program, which include:
  - Program should not undermine industry's plans to meet the CO2 and fuel consumption requirements of the Heavy-duty Phase 2 program
  - CTI should leverage "smart" communications and computing technology
  - CTI will provide sufficient lead time and stability for manufacturers to meet new requirements
  - CTI should streamline and modernize regulatory requirements
  - CTI should support improved vehicle reliability
- EPA is encouraging comment on these goals and welcomes comments on other potential goals and program elements that should be considered for the CTI rule

Overview of Major Program Elements Under Consideration

1. Standards and Test Cycles
2. Certification and Compliance Streamlining
3. Emission Control Technologies
4. In-Use Emission Standards
5. Extending the Regulatory Useful Life
6. Ensuring Long-Term In-Use Emissions Performance

1—Standards and Test Cycles

- Improving Existing Emission Standards
  - Technologies being considered should enable significant emission reductions (compared to current standards over the FTP and RMC cycles)
- New Emission Test Cycles and Standards
  - EPA is considering the addition of a low-load test cycle and standard to improve performance of the emission control system's at low load and low temperature operation
- ANPR is requesting comment on:
  - The addition of CARB's Candidate #7 low-load cycle
  - Adopting CARB's existing "low-NOx" idle standard
  - Adopting a diesel RMC requirement for gasoline engines
  - Potential need for low-load cycle for gasoline engines
  - Modifications to gasoline engine mapping test procedure



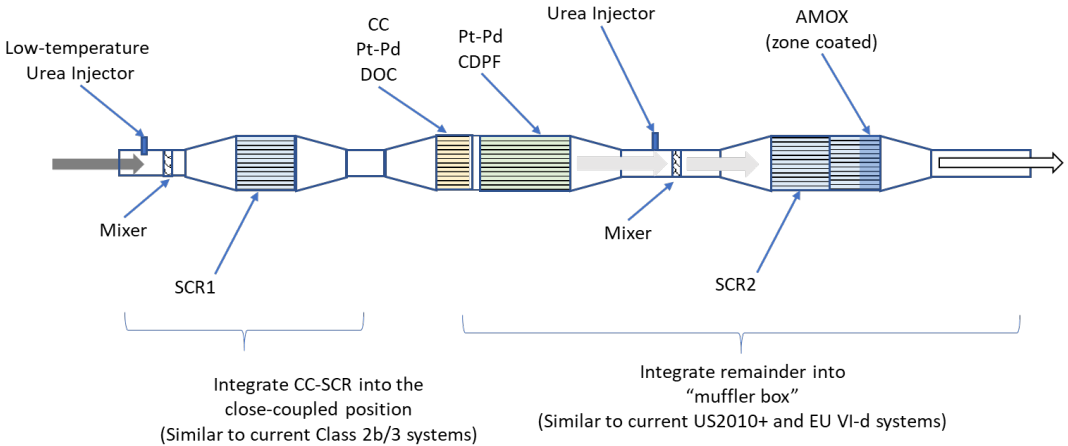
2—Certification and Compliance Streamlining

- ANPR explores opportunities to streamline requirements, while ensuring no loss in protection for public health and the environment
- EPA intends to evaluate compliance costs associated with testing, reporting, and recordkeeping and identify ways to lower costs and streamline requirements for:
  - Pre-certification emission testing
  - Certification reporting
  - Post-certification testing, reporting, and recordkeeping
- The ANPR seeks comment on ways to improve the certification and recordkeeping process

3—Emission Control Technologies Being Considered

The ANPR discusses ways to reduce emissions from diesel and gasoline engines:

Next-generation aftertreatment configurations/formulations

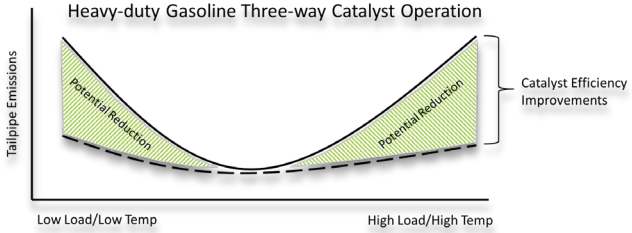


Cylinder deactivation to increase diesel exhaust temperatures without raising CO2 emissions

Cylinder Deactivation (Eaton)

EPA UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
NATIONAL VEHICLE AND FUEL EMISSIONS LABORATORY

Strategies to improve HD gasoline catalyst performance



4—In-Use Emission Test Procedures & Standards

- Significant in-use performance improvements can be made by considering more of the engine operation outside of today's NTE zone during in-use testing
  - Analysis of existing in-use test data indicates that:
    - Less than 5% of a typical time-based dataset are valid NTE events that are subject to the in-use NTE standards; the remaining data are excluded
    - NOx emissions during low load events can be more than double the current NTE standard
- ANPR describes the intent of the CTI to improve our in-use procedures to capture nearly all real-world operation
- Seeking comment on a revised in-use approach, including:
  - Using an approach similar to the European in-use program
  - Use of a moving average window based standard
  - Potential need to include measurement allowances

5—Extending the Regulatory Useful Life

- Today's regulatory useful life covers less than half of the primary operational life (i.e. time to first engine rebuild) for most heavy-duty engines
  - Today's useful life ranges between 110,000 and 435,000 miles, depending on the regulatory class
  - EPA data indicates that the average engine rebuild mileage for those classes range between 315,000 and 910,000 miles
- ANPR seeks comment on issues related to extended useful life requirements such as:
  - Appropriate useful life values
  - Considerations for durability demonstrations
  - Useful life of aftertreatment components
  - How many times engine cores are typically rebuilt

6—Ensuring Long-Term In-Use Emissions Performance

- Deterioration of emission controls can increase emissions from in-use vehicles
- Such deterioration can be inherent to the design and/or materials of the components; the result of component failures; or the result of mal-maintenance or tampering
- The ANPR seeks comment on ways to develop a modern strategy to improve real-world in-use emissions performance, including:
  - Warranties that cover an appropriate fraction of engine operational life
  - Improved, more tamper-resistant electronic controls
  - Serviceability improvements for vehicles and engines
  - Education and potential incentives
  - Engine rebuilding practices that ensure emission controls are functional

Principles Which Guide Our Development of the NPRM

- Reducing in-use emissions under a broad range of operating conditions
- Evaluating effective technological solutions while carefully considering the cost impacts
- Compliance and enforcement provisions that are fair and effective
- Regulations which incentivize early compliance and innovation
- Work toward a coordinated 50-state program
- Actively engage with interested stakeholders

More Information

- Federal Register Notice
  - https://www.federalregister.gov/documents/2020/01/21/2020-00542/control-of-air-pollution-from-new-motor-vehicles-heavy-duty-engine-standards
- EPA's CTI ANPR webpage
  - https://www.epa.gov/regulations-emissions-vehicles-and-engines/advance-notice-proposed-rule-control-air-pollution-new
  - Fact sheet and a link to the Federal Register notice
- CTI docket at www.regulations.gov
  - Docket number: EPA-HQ-OAR-2019-0055
  - View supplemental material and references from the ANPR
  - Submit comments during our 30-day comment period ending February 20, 2020
- EPA's CTI webpage for more information on the rulemaking
  - https://www.epa.gov/regulations-emissions-vehicles-and-engines/cleaner-trucks-initiative

Thank You!

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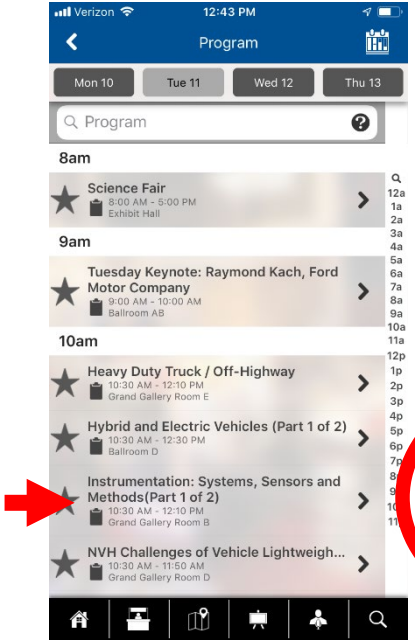

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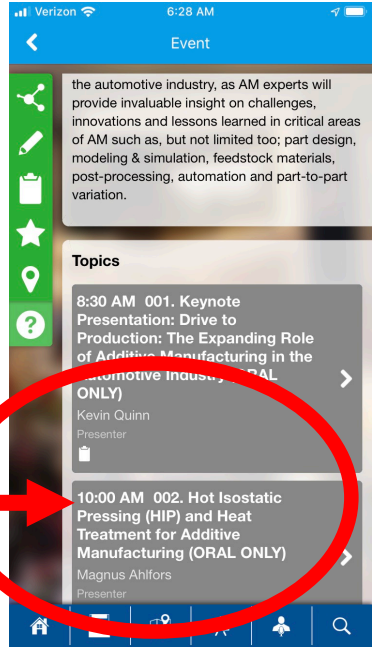
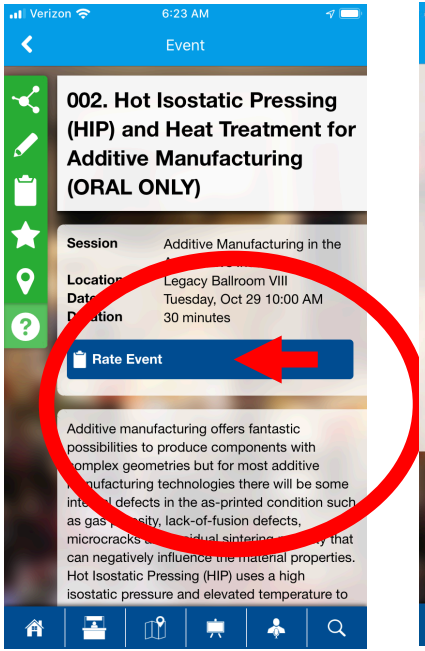
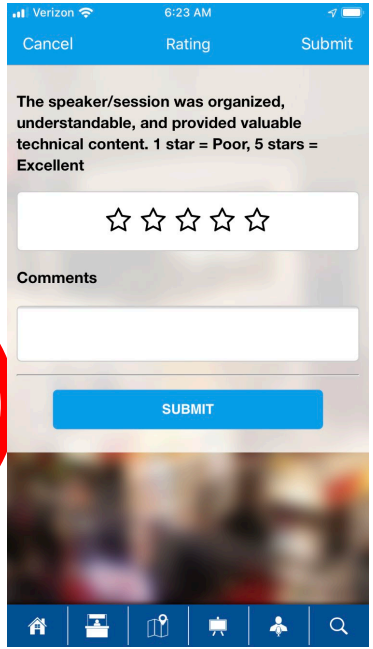


2. Click on individual presentation



3. Click on “Rate Event” button



4. Rate speaker