



Validating the Role of AFVs in Voluntary Mobile Source Emission Reduction Programs

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VMEP -- A Key Facet in the Continuing Evolution of Mobile Source Regulation

- Credit generation is from voluntary effort, which may be seasonal or episodic
- Means of quantifying the benefit must be reliable and defensible
- Must be accompanied by any necessary adjustments for compliance and/or programmatic uncertainty



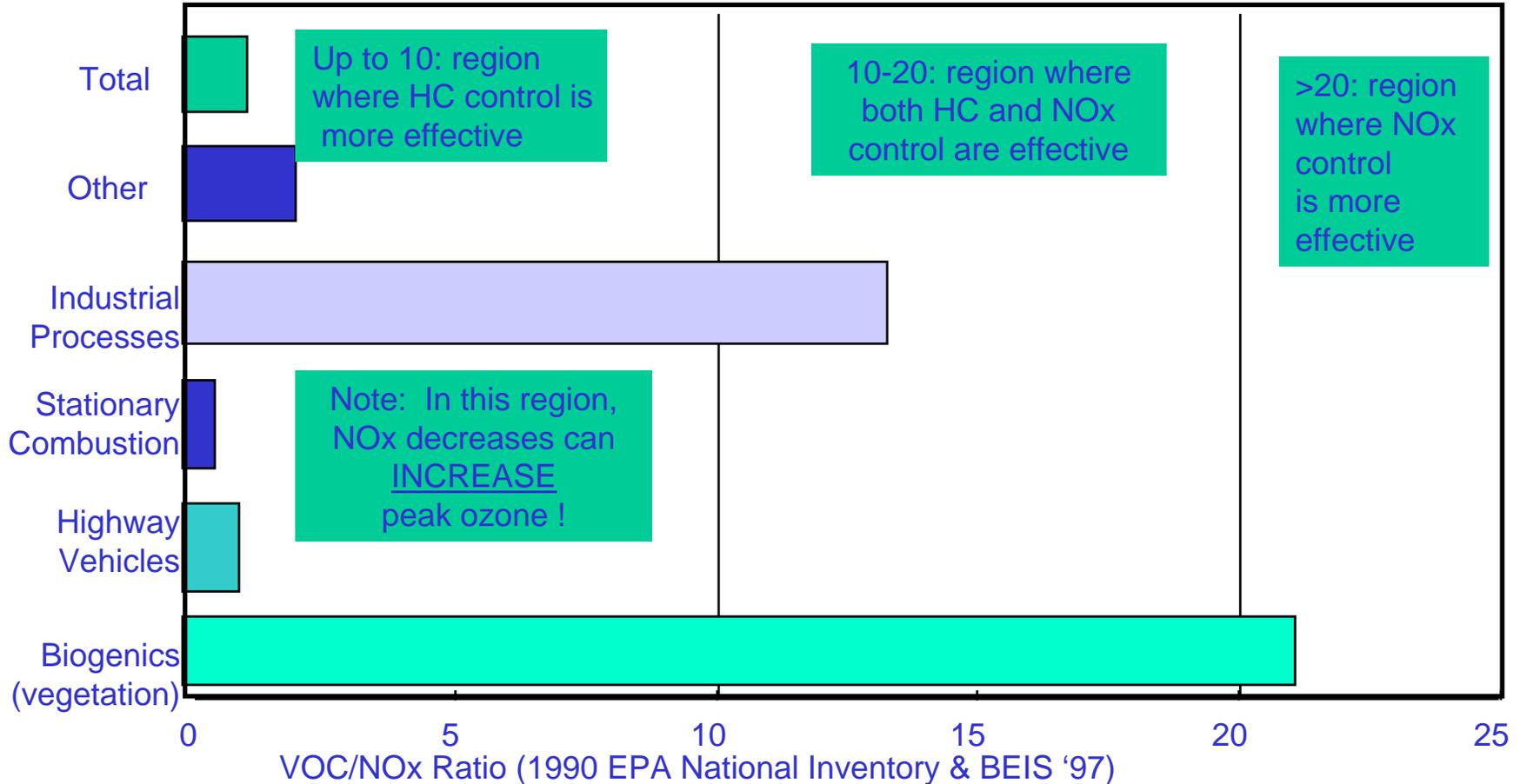
Limited Contribution Potential Acknowledged

- The combination of qualifying measures will not get a credit greater than 3% of the total projected future year emission reduction required to attain NAAQS; or
- 3% of annual ROP requirement (whichever is applicable)
- Must be enforceable, permanent (for its committed duration), and adequately supported by resources



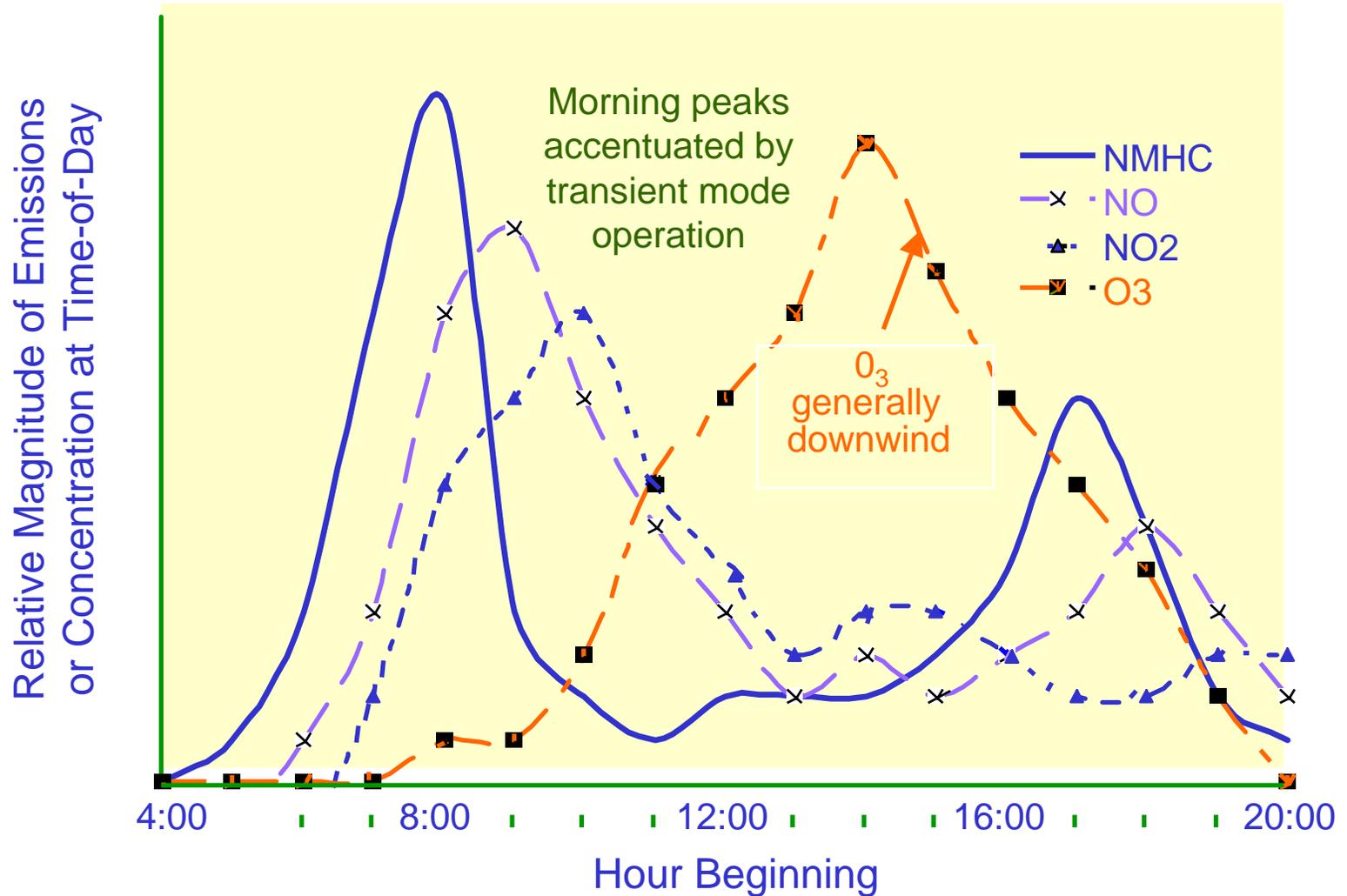
Ozone mitigation depends on which precursor is ambient “limited”: In a commercial or governmental area (VOC-limited), NMHC reductions are best. In rural areas rich in vegetation (NO_x-limited), NO_x cuts are best.

Average source emission ratios (bars) compared with source of ozone formation in an air parcel with an ambient ratio of the same pollutants (grid lines and notes).





Classical Chronology of Ozone Formation: NMOG + NOX (+ CO) + Sunlight + Time





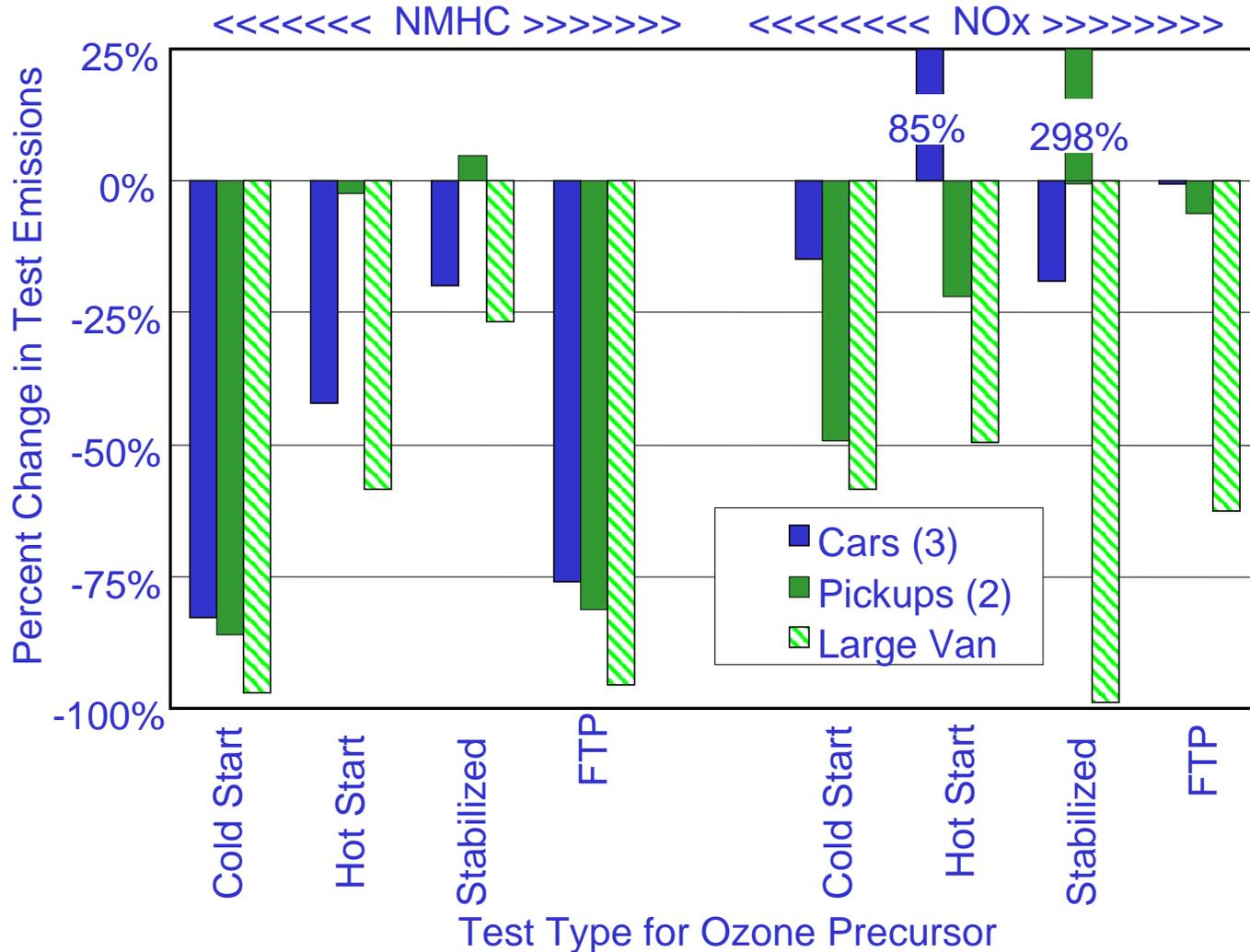
How Do AFVs Fit this Frame?



- Extremely low NMHC emissions, especially with NGV, LPG, and electric vehicles, and gaseous fuels generate virtually no evaporative hydrocarbons
- No morning cold starts mean less VOC added to the precursor “soup”
- Fleet operations are often densest close to urban centers, where NMHC reductions are of greatest value

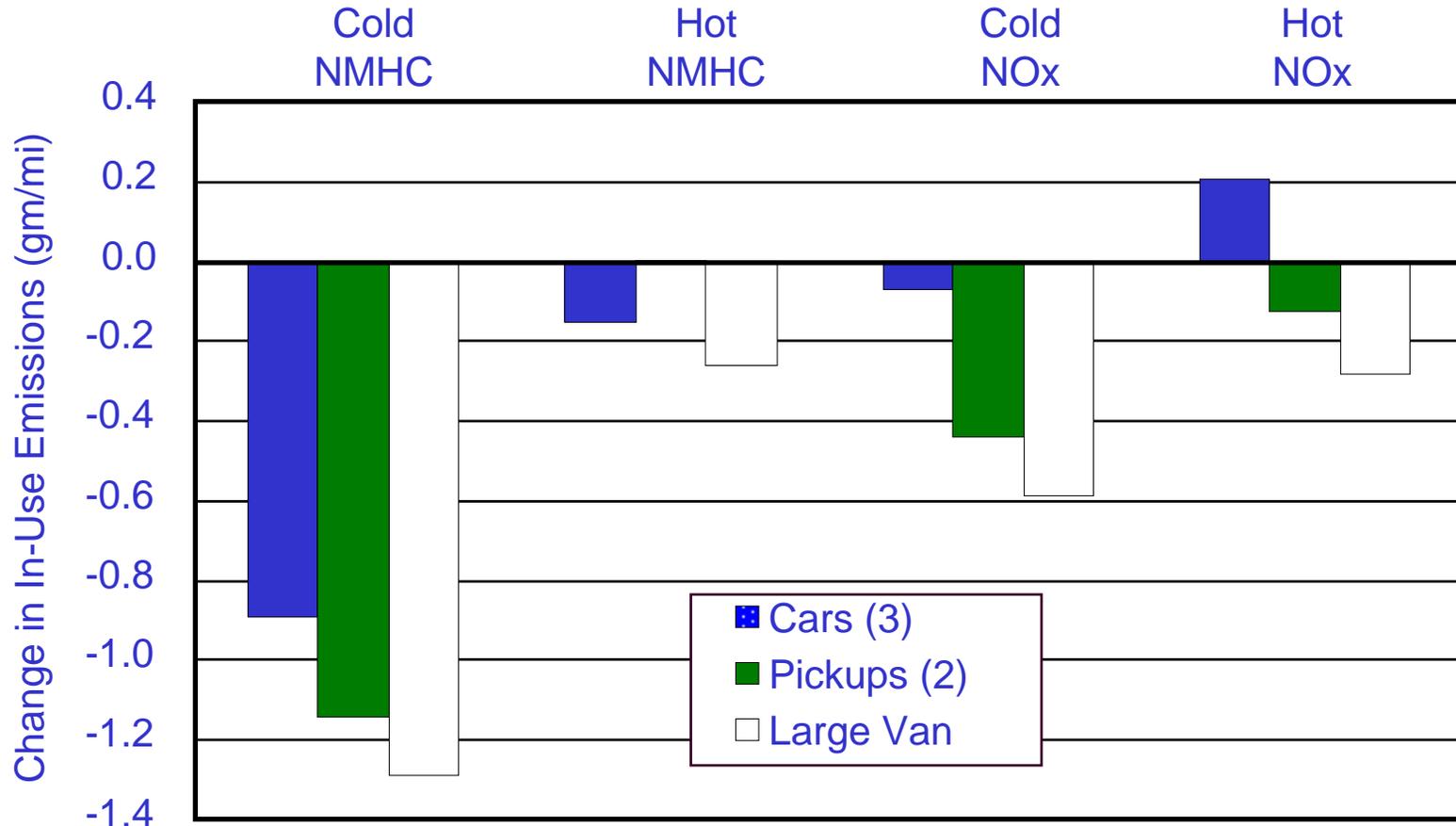


Percent Change in FTP Total and Bag-Specific Emissions, '98 CNG vs. Gasoline





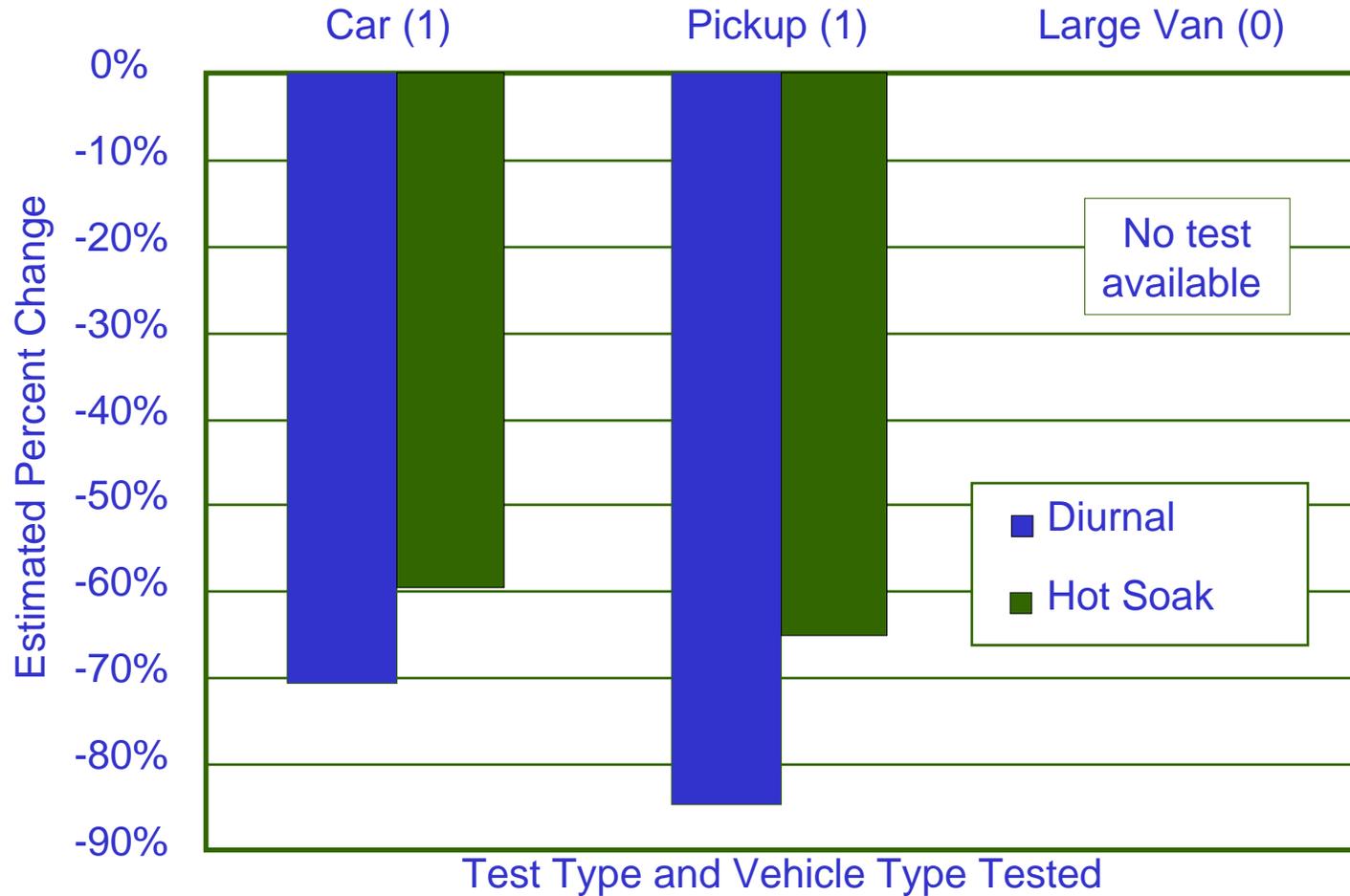
Estimated Mean Change in Per-Mile In-Use Tailpipe Emissions: CNG-for-Gasoline Switch



Vehicle & Gas Type, by FTP Emissions Test Segment



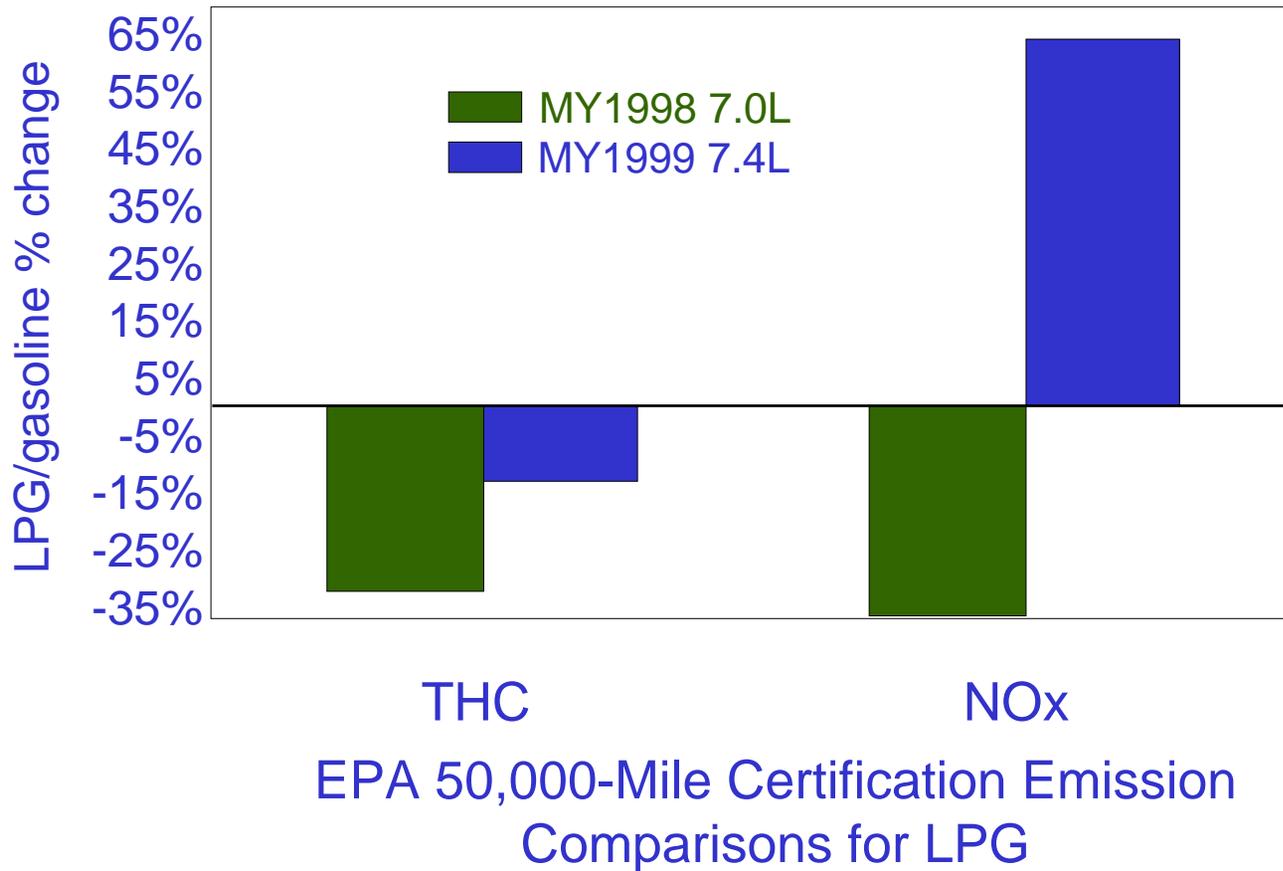
Estimated NMHC Percent Emissions Reductions per Test, Diurnal & Hot Soak: CNG-for-Gasoline Switch



(5% of reported test THC emissions for CNG were assumed to be NMHC emissions)



Ford Medium/Heavy-Duty LPG vs Gasoline Certification Results: Two Model Years





Clean Cities Coalitions Have Been Increasing their AFV Fleets--VMEP Is a “Painless” Means to Get Emission Reduction Credits for Acquisitions

- Credits will always be incremental--the more AFVs, the more net reductions
- Beginning with 1998 MY OEM LD vehicles, year-to-year credits will build against gasoline counterparts through at least 2004
- Argonne is working with EPA/OMS to develop a VMEP credit estimation tool for Clean Cities