

**INTERNAL DELIBERATIVE DOCUMENT OF THE U.S. ENVIRONMENTAL PROTECTION AGENCY
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Karl Simon/DC/USEPA/US

08/29/2007 09:51 PM

To David Dickinson

cc Khesha Jennings, Michael Horowitz, Robert Doyle

bcc

Subject Re: GHG Waive - Meyers doc for 9/4

Would drop out the three questions slides for bob's briefing. on the options page, drop the E. options and add a sentence in the beginning that says we are working these options with OGC and others might fall out of our review . I think we should also do something to indicate that not all of these are equal and that the most defensible position remains a clean approval. 40 pages or so should be doable. thanks

David Dickinson/DC/USEPA/US

David

Dickinson/DC/USEPA/US

08/29/2007 05:34 PM

To Karl Simon/DC/USEPA/US@EPA, Robert

Doyle/DC/USEPA/US@EPA, Michael

Horowitz/DC/USEPA/US@EPA

cc Khesha Jennings/DC/USEPA/US@EPA

Subject GHG Waive - Meyers doc for 9/4

This combines 3 waiver criteria, 3 additional questions and then 2 pages of options - we condensed some but not in the protectiveness slides - 54 pages total.



BobMyers Brief Sept 4 V1 082907v2BD-DD.ppt

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EPA 3916

GHG Waiver Update –
Briefing for OAR Principal Deputy

Administrator

September 4, 2007





Comments on Waiver Criteria & Additional Questions; Next Steps

- Protectiveness
- Compelling and Extraordinary Conditions
- Consistency with Section 202
- Relevance to EPA's waiver evaluation of:
 - global climate change
 - Massachusetts v. EPA decision
 - EPCA
- Options

Protectiveness - CAA language and Key Issues

- Whether California's determination that its "standards will be, in the aggregate, at least as protective of public health and welfare as applicable federal standards ... is arbitrary and capricious."

“California’s Determination”

- **Timing**

- Can determination be made before federal standards exist?
- Should CARB’s determination be evaluated from the time of its rulemaking or based on any new information?

- **Comments**

For Determination is simple since no comparable federal standards (EPA has previously issued waivers in such circumstances and reflects California as the laboratory, pioneer); evaluation should only be on addition of GHG since EPA already waived LEV II and ZEV; determination was reasonable at time of rulemaking and is also reasonable based on review of new NERA/Sierra Report.

Against Until federal process plays out impossible for EPA to evaluate how CA’s standards will compare, federal process will take into consideration CAFÉ/EPCA.



“Standards”

- Should CARB’s determination be based on GHG only or all standards applicable to vehicle category?
- Comments

For CA only required to evaluate its regulations at issue (GHG only); Alliance and others never suggested a comprehensive reanalysis of CARB’s entire program was necessary at time of CARB rulemaking; nevertheless CARB did examine entire program

Against The Alliance did put the the entire “program” into question at time of CARB rulemaking and a comparison is required to give “in the aggregate” any meaning



“At Least as Protective”

- Numerical vs Lifetime In-use Effects
- 209(b)(2) “If each [California] standard is as least as stringent as the comparable applicable Federal standard, such State standard shall be deemed to be at least as protective of health and welfare as such Federal standards for purposes of paragraph (1).”
- Comments
 - For* Would be first time EPA looked at lifetime effects in the context of a waiver review; EPA already waived LEV II and ZEV so should only examine GHG incrementally
 - Against* Inappropriate to rely upon 209(b)(2) for how to define protectiveness as 209(b)(1) requires an analysis of “net emissions” or effects associated with the standards



“Applicable Federal Standards”

- *For* CARB not aware that EPA has ever evaluated any other federal standards than its own, similar to “determination – timing” issue in that EPA has previously issued waivers with no federal standard in place
- *Against* The federal program will be product of inter-agency effort to avoid conflicts with EPCA/CAFÉ and will take into account considerations that CA has not, federal program will effect all 50 states



“Arbitrary and Capricious”

- Burden of Proof – CA must make initial protectiveness determination and submit to EPA
- Standard of Review - Challengers to the waiver must meet the burden of proof with clear and convincing evidence (MEMA I and Legislative history)
- Comments

For “The language of the statute and its statutory history indicated that California’s regulations, and California’s determination that they comply with the statute, when presented to the Administrator are presumed to satisfy the waiver requirements and that the burden of proving otherwise is on whoever attacks them.” (MEMA); Alliance is attempting to remake the legal burden of proof standard into a burden on California to provide something more than it provided in its request (including an analysis of in-use effects, not required to look at a new report based on old information); CARB made a full determination and submitted it in the waiver request and CARB’s update (even if necessary) shows that the vehicle program remains more protective

Against California has not carried its initial burden of proof of making a well-informed determination that the GHG regulations will “do no harm” – CARB did not compare the two programs at the time of its rulemaking and CA offered only a conclusory statement that questioned how anyone could challenge the fact that no federal standards exist; CARB nowhere demonstrates that it made a direct and complete comparison of the federal and California programs



NERA/Sierra Research Report 2007 - Overview

- NERA (an economic consulting company) and Sierra Research (a vehicle technology research company) analyzed the impacts of CA's GHG standards for the Alliance of Automobile Manufacturers
- NERA/Sierra's assessment concluded the CA GHG tailpipe standards, in combination with the ZEV Standards, are not as "protective" as Federal regulations
- CARB asserts that appropriate analysis and consequent determination is based on review of "incremental" difference from GHG standards to then existing CA program (which has its own prior protectiveness determination)
- This finding was based on increased criteria air pollution emissions from three different effects:
 - Fleet Turnover
 - Rebound Effect
 - Upstream Emissions



NERA: Fleet Turnover

- NERA argues that California GHG tailpipe standards will cause delayed fleet turnover and, thus, increase criteria air pollution
- NERA's Logic
 - Prices of new vehicles increase from GHG Rule which causes the prices of existing vehicles to increase as well
 - Decision to scrap an existing vehicle depends upon trade-off between value of existing vehicle in its working condition and its scrappage value
 - Rising prices of existing vehicles leads to decisions by some consumers to delayed scrappage of vehicles
 - Older vehicle stock (fewer new vehicles/more existing vehicles) on the road results in criteria air pollution increase
- Delayed fleet turnover single largest factor (accounts for ~3/4's) of criteria air pollution increases in NERA/Sierra Research study



NERA: Fleet Turnover

- NERA/Sierra Research Results
 - In 2020, new vehicle sales will be 176,000 lower from California GHG/ZEV rule
 - Cumulative number of vehicles in the California fleet with model years before the regulations take effect (i.e., pre-2009 model year) will be 1 million greater in 2020 from California GHG/ZEV Rule
 - As the average age of the California vehicle fleet increases, criteria air pollution increases



CARB Response: Fleet Turnover

- CARB: NERA/Sierra Research sales/delayed scrappage estimates are too high
- Why?
 - NERA/Sierra Research vehicle cost estimates too high
 - Sierra Research: \$3000-\$4000 per vehicle (California GHG/ZEV Rule)
 - CARB: \$1000-\$1300 per vehicle (GHG Rule)
 - NERA doesn't accurately account for "fuel economy benefits" of new vehicles
 - With GHG Rule, fuel economy improvements are "synchronized" with higher priced new car purchases
- CARB Conclusion: Combined sales/scrappage impacts likely to be close to zero since fuel economy improvements lower fuel costs roughly in line with increase in monthly payments from higher priced new vehicles
- CARB asserts that EPA in ZEV waiver validated the reasonableness of the CARB ZEV cost projections (at least through 2011, end year of waiver)



CARB Response: Fleet Turnover

- In addition, CARB used a consumer choice vehicle model for California, CARBITS, to estimate CA vehicle sales impacts from its GHG Tailpipe Rule
- CARBITS estimates increases in vehicle sales in CA in the near-term (result: accelerated fleet turnover) but declines in CA vehicles sales in long-term (lost vehicle sales of 61,000 in 2020; vs.176,000 NERA)
- By 2020, CARBITS estimates that lost vehicle sales leads to delayed fleet turnover
- Increase in criteria air pollutants in out years from delayed fleet turnover (i.e., 2020) is 2.5 tons/day; less than full fuel life cycle benefits of the Rule



Rebound Effect

- **Definition:** The rebound effect for vehicle fuel economy is defined as the increase in vehicle travel resulting from a decrease in the fuel cost per vehicle miles as a consequence of an increase in fuel economy
- **Theory:** Increasing fuel efficiency lowers the effective cost of driving to the consumer, which results in an increase in vehicle usage (holding all other factors constant)
- **Example:** If the rebound effect is, say, 10%, a 5% reduction in fuel costs per mile will result in a 0.5% increase in the number of miles driven



Rebound Effect: CARB's Approach

- CARB used two types of analysis to evaluate the impact of the proposed regulations on rebound effect
 - Economic modeling (UC Irvine study)
 - Travel demand modeling (Southern California Association of Governor's (SCAG))
- The UC Irvine study (by Small & Van Dender) is different from previous econometric studies in that it allowed the rebound effect to vary based on changes in income and congestion
 - Changes in income important since Small and Vender assumed CA real income grows at 1.6 percent per year based on historical data
 - Small and Van Dender estimate rebound effect of 3.08% in 2020*.
 - The final report appears to adjust this number to 4.04%.
- The travel demand modeling indicate a similar elasticity of VMT to fuel cost of about 4% in 2020

* ISOR

NERA: Rebound Effect

- NERA developed their own study to calculate a California rebound effect of 17% based on California vehicle inspection data from 1998 - 2003
- NERA re-estimated the CARB-sponsored study on the rebound effect by Small & Van Dender; NERA found the long-run rebound effect in California to be 13%
 - The major difference between the NERA and the Small and Van Dender study was the way nominal income was converted to real income
 - NERA tried to approximate state cost of living adjustments, but had to modify metropolitan cost of living adjustments; Small and Van Dender used the national consumer price index
 - Based on the difference in the income calculation, NERA found that income was no longer statistically significant in explaining changes in the rebound effect. Therefore, they removed this term from the model.

Upstream Emissions Impacts

- Large differences between ARB and NERA/Sierra estimates:
 - ARB: upstream emissions reductions outweigh emission increase from rebound etc.
 - NERA: there are small upstream emission reductions, not large enough to offset rebound etc.
- Though NERA cites “significant flaws” in the ARB estimates, NERA’s estimates largely undocumented
- ARB estimates may be conservative
 - only accounted for reductions in the transportation and distribution of fuel
- GREET national numbers more in line with ARB

In 2020	ARB Tons/Day Reduction	NERA Tons/Day Reduction
NMOG+ NOx	6.0	1.1-1.5
PM10	0.8	0.0016- 0.005

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CARB Estimate of Change in Criteria Air Pollution with GHG Rule in 2020

Criteria Pollutant in Tons Per Day

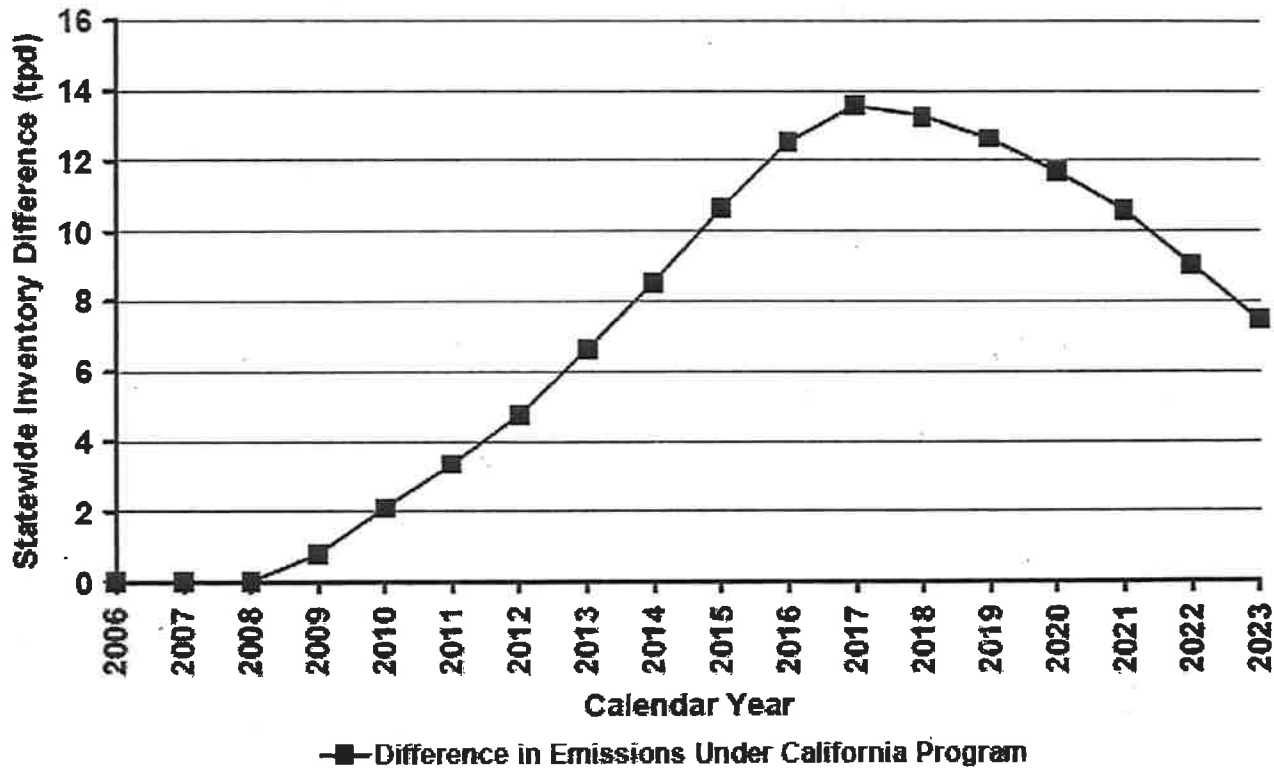
	ROG	NOx	PM10
Baseline Emissions	231	187	4
Combined Impact, Method 2			
Fleet Turnover and Rebound Changes (One EMFAC run)	1.61	1.17	0.2
Fuel Cycle Changes	-4.6	-1.4	-0.2
Combined Impact (using EMFAC run)	-3.0	-0.2	-0.2
Percent change (using EMFAC run)	-1.30%	-0.12%	-1.40%

Source: CARB, Initial Statement of Reason, Table 12.4-1, p. 37

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NERA Estimate of Change in California Criteria Air Pollution with GHG/ZEV Rule

Statewide VOC + NO_x (EMFAC)

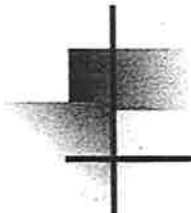


Source: NERA/Sierra/Air Study, Effectiveness of the California Light Duty Vehicle Regulations
As Compared to Federal Regulations, June 15, 2007

Summary Table

	CARB	NERA	NHTSA CAFE Rule
Fleet Turnover	<ul style="list-style-type: none"> • \$1000-\$1300 cost per vehicle • accelerated fleet turnover in near-term; small delayed fleet turnover in out years (i.e., 2020) 	<ul style="list-style-type: none"> • \$3000-\$4000 cost per vehicle • delayed fleet turnover in near term; large delayed fleet turnover in out years (i.e., 2020) 	None
Rebound	3% in 2020	17% (2003) 13% (2007)	20% (2006) 15% (2007 proposed)
Upstream Emissions	6 tons/day reduction in ROG+NOx	1.1-1.5 tons/day reduction in ROG+NOx	NHTSA: upstream emissions outweigh downstream emissions

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Compelling and Extraordinary Conditions - CAA Language and Key Issues

Section 209(b)(1)(B) ... whether “such State [California] does not need such State standards [California] to meet compelling and extraordinary conditions.”

Opponents

- Need = whether CA could benefit from its own standards (GHG not localized pollutant)
- Meet = whether CA’s GHG standards will redress/mitigate climate change effects on compelling conditions
- Extraordinary = whether CA’s conditions are occurring and are sufficiently unique from other states

Need

• CARB

- Relevant inquiry is whether CA needs its own emission control program, not whether any given std is necessary. Need does not refer to levels of pollution directly but to the factors/conditions that tend to produce them; EPA's past practice
- Congressional history and EPA practice is to afford CA broad discretion on need
- Minimizing ozone problems fills the expanded definition provided by the Alliance

• *Opponents*

- "Need" and "Meet" should be distinguished:
 - need = whether CA could benefit (e.g. are necessary) from its own stds
 - meet = whether the stds help mitigate the conditions
- When CA has an especially severe local air quality program (ozone) then a case for separate stds can be made, focuses on "*such* State standards" to suggest a standard by standard analysis rather than need for whole emission program
- The preemption in 209(a) is broad and implies "field preemption," and only exception is where CA has unique conditions and this cannot be met with a global problem that does not affect CA in a qualitatively or sufficiently quantitatively unique way. Minimal direction on GHG impact does not amount to a "need."

Meet - 1

CARB

- By industry arguing the “meet” issue they are conceding that CA “needs” a program
- Alliance’s argument re field preemption in 209(a) fails due to 1. In environmental matters preemption provisions are to be narrowly construed, and 2. It reads out the historically recognized role of CA as a pioneer and laboratory.
- Alliance suggestion of a test of redressability is answered by: “A reduction in domestic emissions would slow the pace of global emissions increases,” and the risk of catastrophic harm “would be reduced to some extent....” *Mass v. EPA*
- Ozone and Science
 - Dr. Schneider and Dr. Kleeman testified that global warming is projected to increase the number of days conducive to ozone formation in South Coast and San Joaquin Valley
 - Relatively small reduction in CO2 emissions is scientifically important because of the nonlinear nature of the climate system
 - The IPCC 2007 4th Assessment Report, Dr. Schneider, Hansen, and others state the GHG emissions are on trajectory that would likely increase temperatures by at least 2 degrees Celsius



Meet - 2

- *Opponents*
 - CA has not and can't show that GHG stds will provide any discernable benefit to meet CARB's identified downstream C and E conditions or impact climate change overall
 - Alliance has provided extensive evidence that CA does not dispute re the GHG standards adopted even nationally or worldwide would not have measurable effect on temperature
 - CARB's response that any action by the State in the name of climate change should be afforded policy deference is misplaced; CARB is not acting in context of expansive state police power and is not free to take tiny steps that may do nothing to alleviate climate change
- *Others*
 - The sole relevant criterion regarding the "effectiveness" of the GHG stds is whether the protectiveness criteria is met. CA need only show a rational connection between its regulatory action and the problem being addressed
 - EPA is not to micromanage each CA standard and pollutant

Extraordinary Conditions - 1

CARB


- No indication in the language of section 209 or legislative history that suggests that CA's pollution problem must be worst in the country (citing 1984 PM waiver)
- In the alternative, strong evidence of extraordinary conditions re coastal resources, Bay-Delta saltwater intrusion, agricultural impacts, levee collapse and flooding, wildfires, snow packs and melts
- Serious ozone levels will be exacerbated – ozone long recognized as a C and E condition



Extraordinary Conditions - 2

Opponents

- “Extraordinary” embodies a concept of uniqueness
 - Global warming to not a C and E condition specific to CA
 - “unique” effectuates the underlying purpose of the waiver provision which was to provide CA leeway to address the issue of localized urban air pollution
- EPA’s 1984 waiver re PM even acknowledges “unique to CA” requirement
- CA’s “laundry list” of potential impacts is the same as many or most states
 - Impacts must be qualitatively or quantitatively extreme



Consistency with 202(a) - CAA Language and the *MEMA I* Test

Section 209(b)(1)(C) –

The Administrator shall ... (grant the waiver unless he finds)... “such State standards and accompanying enforcement procedures are **not consistent with section 202(a) of (the Act).**”

EPA has stated that California’s standards and accompanying test procedures are **inconsistent** with section 202 of the Act if:

- 1) there is **inadequate lead time** to permit the **development** of technology to meet those requirements, giving appropriate consideration to the **cost of compliance** within that time frame; and
- 2) the Federal and California test procedures impose **inconsistent certification certification** requirements so as to make manufacturers unable to meet both sets of requirements with the same vehicle. (NOTE -- This is not an issue in this Waiver)



How EPA Looks at Technological Feasibility

- EPA, in making consistency determinations under 209(b), is guided by Federal Court decisions applying the sec. 202(a) lead time requirements for Federal standards.
- *NRDC v. EPA* (DC CIR. 1981), Court upheld vehicle PM stds issued in 1980 and effective for 1985 MY. Court established the test as follows:
 - EPA will have demonstrated the reasonableness of its basis for prediction (that stds are technological feasible) if it:
 - answers any theoretical objections to the [projected control technology],
 - Identifies the major steps necessary in refinement of the [technology], and
 - Offers plausible reasons for believing that each of those steps can be completed in the time available.



How EPA Looks at Cost

- From the *MEMA I* case:
 - EPA must determine that standards are technologically feasible within “economic parameters” because “Congress wanted to avoid undue economic disruption in the auto manufacturing industry, and also sought to avoid doubling or tripling the costs of vehicles to purchasers.”
 - In line with this, EPA waiver review must determine that costs of compliance must be a very high level, and excessive before EPA would find CARB standards to be inconsistent with section 202(a).
 - EPA Waiver decisions have established the principle that, because Agency performs only a narrow review of the CARB decision, we give deference to CARB’s judgment on the costs vs. the benefits of its emission control regulations.

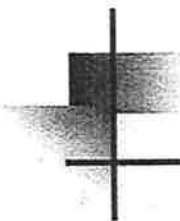


How EPA looks at Lead Time

- *NRDC* makes clear that Congress intended EPA to project future advances in pollution control technology rather than be limited to existing at time standards were set – a longer lead time gives greater scope for theoretical solutions and time to commit to mass production of a chosen prototype.
- *International Harvester* sets requirement for further demonstration of necessary technology when lead time is shorter [CARB has identified near term technologies and has identified projected control technologies]

CARB Standards as MPG targets

Model year	Cars plus LDT1s
2009	27.6 mpg
2010	29.6 mpg
2011	33.5 mpg
2012	38.4 mpg
2013	39.4 mpg
2014	40.3 mpg
2015	42.0 mpg
2016	43.7 mpg



CARB's Technological Feasibility Determination in the Waiver Request

- Four Areas of GHG Reduction Technologies
 - 1) Engine, Drivetrain and other vehicle modifications
 - 2) Car Air Conditioning System modifications
 - 3) Alternative Fuel Vehicles
 - 4) Exhaust Catalyst Improvement

 - The technology packages projected for compliance contain many technologies in current vehicles; this makes the GHG regulations less “technology forcing” but rather combining “off the shelf” technologies.

 - Record shows that Mfgs will be able to apply these technology packages/combinations for the deadlines following MYs 2012 and 2016, which are lead times of eight and 11 years respectively (CARB bases beginning of Lead Time as 2004, when GHG standards adopted)



CARB's New Technological Feasibility Information

- More specific information on the progress of numerous technologies – both as stand-alone technologies and as combinations -- SINCE the December 2005 request, including:
 - -Valve control (variable valve timing & lift) in about 55% of the 2006-7 LDV fleet
 - Cylinder deactivation by 3 Mfgs in the US
 - Gas Direct Injection – currently in models by BMW, VW, Audi & Gm, active development by FMC, Mazda, & Mitsubishi
 - Turbocharging – several US models, and extensive experience in Europe
 - CVT – in current models by Nissan, Toyota, Ford & Chrysler
 - 6 speed AT – in models of almost all US Mfgs
 - CVA - Valeo, a major component supplier, anticipates commercialization of this technology by 2010 and is working with several manufacturers to bring it to market.
 - Electrohydraulic and electric power steering – in Honda, Toyota and Mazda models, and in almost all Mfgs hybrid models

CARB's New Cost Information

- There are recent and current examples of technological development through innovative design which has reduced both cost and complexity:
 - the Nissan continuously variable valve timing and lift system,
 - the BMW Valvetronic system,
 - Honda's variable flow turbocharger, and
 - the 6-speed automatic transmission (LePeltier design) from the NESCAAF study.

- Cost estimates are accurate and even conservative; industry unfairly highlights the CARB underestimation in ZEV regulations (cost of batteries)



Industry - New Technological Feasibility Information

- Mfgs reasonably believed that the CARB GHG standards were preempted (by EPCA) and thus reluctant to begin expending resources to comply in September 2004 (time of adoption) when they would need to prepare for first year of compliance (MY 2009)
- Even if EPCA preemption fails, and EPA waiver is granted, the CARB rulemaking record assertion of 4 year lead time for compliance with the standards is at odds with CARB statements in VT case) that some manufacturers could take up to 6 or 7 years to comply with the MY 2011 standards and MY 2012 standards, respectively



Industry - New Technological Feasibility Information

- The GHG regulations will require different auto powertrain designs with challenging economics given the lower economies of scale (i.e., more frequent redesigns will be necessary, so Mfgs can't spread out costs for longer time periods)
- Whole classes of vehicles would be expected to be eliminated or be severely restricted in availability – some Mfgs predicted (in VT case) the disappearance of some popular models from California sale.
- The regulations impose ambitious mandates so technically challenging that compliance may result in vehicles with compromised performance and other attributes.