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Subject: DaimlerChrysler Comments on EQB's Proposal to Amend Chapter 126, Subchapter D of Pennsylvania's Clean Vehicle Program

This letter and its attachments transmit the comments of DaimlerChrysler Corporation on Pennsylvania's Environmental Quality Board's proposal to adopt California's Greenhouse Gas (GHG) exhaust emission standards and test procedures for passenger cars, light-duty trucks and medium-duty passenger vehicles as an amendment to Chapter 126, Subchapter D of Pennsylvania's Clean Vehicles Program.

DaimlerChrysler Comments:

Harbour Consulting Attachment:

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The Effects of AB 1493 on U.S. Employment in the Automotive Manufacturing Industry

Prepared by Harbour Consulting

July 15, 2005

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Qualifications of Harbour Consulting

Harbour Consulting is a manufacturing and management consulting firm focused on improving the overall competitiveness of manufacturing companies. The company has worked closely with many manufacturers to help them compete successfully in the domestic and global marketplace. Harbour Consulting assists in the implementation of quality, productivity and overall cost improvement initiatives while introducing companies to world-class manufacturing techniques. Harbour Consulting continues to study and service manufacturing organizations throughout North America, Europe and Asia.

In addition to its consulting services, Harbour Consulting publishes ***The Harbour Report***, the most comprehensive guide to automotive manufacturing in North America. The only source of its kind, ***The Harbour Report*** provides an insider's look at many of the factors shaping the auto industry today. ***The Harbour Report*** contains performance data for more than 120 Assembly, Stamping and Powertrain plants, including plant-by-plant and company-by-company productivity rankings, as well as detailed tables and trend charts, and a separate section covering the strengths and weaknesses of each company.

Ron Harbour, President of Harbour Consulting, has been a key member of the Harbour team since 1983. As the primary author of the Harbour Report, Ron has an intimate knowledge of automotive manufacturing plant performance and has personally toured most of the OEM factories in North America, Europe, and East Asia. Ron also authored a monthly column in *Automotive Industries* magazine for several years. Over the years, Ron has successfully led a wide variety of assignments in the automotive industry. Ron

has directed projects for nearly every major automotive manufacturer worldwide, including DaimlerChrysler, Ford, General Motors, Honda, Toyota, Nissan, Hyundai, Mitsubishi, KIA, Samsung, Isuzu, BMW, Land Rover and Saab. His work with automotive clients has included factory operation improvements, new product development, investment and product cost reductions, product teardowns, strategic planning, competitive analysis, and plant assessments. He also has provided key input in the development of new vehicle programs, common processes, plant layout, long-term manufacturing and labor strategies, and supplier improvement.

Aaron Olmstead is a Senior Data Analyst at Harbour Consulting. He is an expert in statistical analysis and database programming, and has a Bachelor's degree in Statistics from the University of Michigan - Ann Arbor. Aaron has spent the past two years analyzing automotive industry labor and manufacturing performance data for the Global Harbour Report, and manufacturing operations assessment projects. Aaron also has several years experience analyzing automotive industry marketing data for the annual North American Tier-1 Supplier – OEM Working Relations Survey at Planning Perspectives, Inc.

Overview

The California Air Resources Board (CARB) has approved a regulation (the AB 1493 rule) that regulates the greenhouse gas emissions from vehicles sold in California. Several other states (New York, Massachusetts, Maine, Vermont, Connecticut, New Jersey and Rhode Island) also intend to adopt the regulation.

An analysis by Sierra Research Inc. (Sierra) indicates that the AB 1493 regulation would have a disproportionate impact on the ability of some OEMs to cost-effectively produce vehicles because of the different product mixes that the OEMs sell. This would force specific OEMs to severely limit vehicle sales in states that adopt AB 1493, as it would be cost-prohibitive to equip their vehicles with the technology required to meet the new standards.

Applying these conclusions to 2003 U.S. vehicle sales data for the applicable states, Harbour calculated the vehicle production losses in North American vehicle assembly plants. Production losses also were calculated for OEM-produced engines, transmissions, and body stampings specific to vehicle applications.

Harbour used OEM-provided staffing data to determine the relationship between production loss and plant workforce adjustments. From this relationship, Harbour calculated the loss of OEM plant jobs based on the assumed production losses.

Using U.S. Bureau of Labor Statistics (BLS) data, Harbour calculated the number of indirect jobs (from industries supporting automotive manufacturing: parts suppliers, raw

materials, equipment, etc.) that would be lost based on the assumed production losses. Similarly, Harbour also calculated the number of distribution jobs (freight, dealerships) that would be lost.

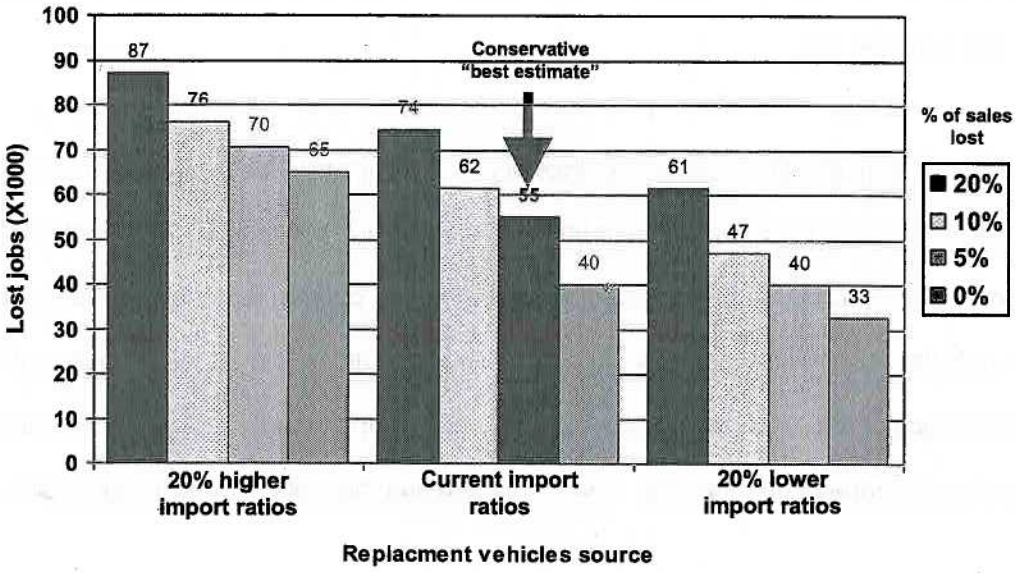
Harbour then adjusted this "gross" loss of jobs for the new jobs that would be created by vehicles produced to displace models no longer on the market. The methodology utilized to calculate the number of jobs created by the replacement vehicles was equivalent to the methodology used to calculate to gross loss of jobs. Several different scenarios were analyzed (based on lost sales and import ratios) to calculate the potential range of net jobs lost. The results are summarized in the following tables.

TABLE 1 – Gross U.S. Workforce Loss by OEM

COMPANY[1]	U.S. Volume Loss	Total Volume Loss	OEM Workforce Loss	Indirect Workforce Loss	Distribution Workforce Loss	Total U.S. Workforce Loss
GM	-230,461	-383,763	-9,740	-36,839	-15,351	-61,929
Ford	-228,825	-338,325	-9,434	-37,869	-13,533	-60,836
DCX	-79,558	-198,577	-1,580	-12,888	-7,943	-22,411
Nissan	-51,445	-112,073	-1,351	-5,599	-4,483	-11,433
Mitsubishi	-44,155	-46,908	-2,551	-5,158	-1,876	-9,586
SIA	-30,279	-63,623	-565	-2,948	-2,545	-6,057
Auto Alliance	-13,548	-13,548	-337	-2,242	-542	-3,121
CAMI	0	-10,702	0	0	-428	-428
Honda	0	0	0	0	0	0
Toyota	0	0	0	0	0	0
Hyundai	0	0	0	0	0	0
	-678,271	**-1,167,519**	**-25,558**	**-103,543**	**-46,701**	**-175,802**

[1] GM includes Buick, Cadillac, Chevrolet, GMC, Oldsmobile, Pontiac, Saturn, Saab, and Suzuki (excluding NUMMI); Subaru is listed separately
Ford includes Ford, Lincoln, Jaguar, Aston Martin, Volvo, and Mazda (excluding Auto-Alliance)
DCX includes Chrysler, Dodge, Jeep, and Mercedes; Mitsubishi is listed separately

TABLE 2 – Net Workforce Loss Scenarios



Assumptions: Sierra Research Conclusions

Sierra Research conducted analysis on the costs that the OEMs would face in order to comply with the AB 1493 standards. The following section summarizes the conclusions of this analysis, as it relates to Harbour's research.

AB 1493 mandates increasing fuel-efficiency standards, to be phased in between 2009 and 2016, by vehicle segment (Passenger Cars / LDT1 and LDT2 / MDPV)[2]. The minimums apply to OEMs' fleet average fuel efficiency in each segment. The AB 1493 fuel economy minimums are very aggressive compared to the existing federal CAFE regulations. Currently, the CAFE minimum for Passenger Cars is fixed at 27.5 mpg, and the minimum for the LDT1/LDT2 segment is 21.0 mpg (MDPVs are not regulated). It should be noted that how the segments are grouped also has a significant impact on OEMs ability to meet the standards (e.g. grouping less fuel-efficient LDT1s with Passenger Cars effectively increases the fuel-economy standards for that group).

TABLE 3 – AB 1493 Fuel Economy Standards

Year	--Passenger Cars/LDT1--	--LDT2/MDPV--
2009	27.6 mpg	20.3 mpg
2010	29.7 mpg	21.2 mpg
2011	33.5 mpg	22.9 mpg
2012	38.4 mpg	24.7 mpg
2013	39.4 mpg	25.1 mpg
2014	40.3 mpg	25.5 mpg
2015	42.0 mpg	26.2 mpg
2016	**43.7 mpg**	**26.8 mpg**

[2] The AB 1493 rule officially regulates greenhouse gas emissions. However, this effectively translates into increasing fuel-economy standards.

The fact that the fuel-efficiency minimums apply to the OEMs' fleet-average (for a specific segment grouping) is significant because of the different product mixes sold by the OEMs. The "affected" OEMs (GM, DCX, Ford and Nissan) sell a greater proportion of larger vehicle models (particularly within the Passenger Car / LDT1 segment) than the "unaffected" OEMs (Honda, Toyota, and Hyundai). Since larger vehicles inherently have lower fuel-efficiency than smaller vehicles, the unaffected OEMs are much closer to compliance with the proposed standards. Thus, product mix alone will cause certain OEMs to be disproportionately impacted by the AB 1493 standards.

OEMs would need to implement new technology in their vehicles, such as strong hybrid-engine systems, to comply with the AB 1493 standards. The cost-per-vehicle of implementing this new technology would be substantially higher for the affected OEMs, as they are currently much further from compliance (due to model mix). The higher cost-per-vehicle for an affected OEM would raise that OEM's vehicle prices to a level that would not be competitive in the marketplace. For purposes of this analysis, it has been assumed that the relevant affected OEMs (and all of their subsidiaries) would be forced to curtail their product offerings in states that adopt AB 1493: each of the relevant affected OEMs would reduce sales approximately 75% in the Passenger Car / LDT1 segment[3], and approximately 15% in the LDT2 segment (these lost sales would be comprised of the OEMs least fuel-efficient vehicle models within the segment). This is more conservative than Sierra's conclusion that OEMs would reduce sales by 75% in Passenger Cars, 100% in LDT1's, and 15% in LDT2's. Based on OEM input, Harbour's

[3] One notable exception is for Nissan, who was assumed to reduce sales 59% (instead of 75%) in the PC/LDT1 segment. This was due to the 2.5 liter Altima, which had such high sales volume in California, it would have represented over 90% if included in the lost sales.

analysis assumed that lost vehicle sales translate into lost production at the OEM plants producing those vehicles.

Assumptions: State of the Industry

The following analysis was conducted by Harbour to estimate the effects that the AB 1493 regulation would have on the workforce in the U.S. automobile manufacturing industries, and its supporting industries. The calculated effects represent a snapshot in time, occurring after the AB 1493 standards have been fully imposed and the industry has rebalanced itself to meet the new demands of the market.

For the purposes of our analysis, it was necessary to make a few assumptions regarding the future state (year 2016) of the industry:

1) Analysis of OEM plant jobs lost assumes that the future state of the industry, with respect to the number of OEM plants[4], and their production volumes across market segments, will be comparable to current state
2) Analysis of indirect jobs lost assumes that the future state of the industry, with respect to the number of employees required to support the production of a given number of vehicles (i.e. U.S. Bureau of Labor Statistics, Employee Requirements data), will be comparable to the current state
3) Analysis of indirect jobs lost assumes that the future state of the industry, with respect to the percentage of domestic content contained in each OEMs U.S.-produced vehicles (NHTSA American Automobile Labeling Act data), will be comparable to the current state

[4] Includes assembly, engine, transmission, and stamping plants

It is Harbour's opinion that these assumptions are reasonable. In general, it is more conservative to assume that a current state will be maintained than to assume that some change will occur. Furthermore, data specifically related to these assumptions were analyzed, and the results substantiate the assumptions. Regarding assumption 1, current data does not suggest any dramatic changes in the next 10 year period. Regarding assumption 2, while the workforce of motor vehicle parts manufacturing (the largest component of the indirect jobs that support the automotive manufacturing industry) has been in decline the past several years, regression analysis of Bureau of Labor statistics employment data shows that these declines have essentially bottomed out, implying that future losses in this industry would be questionable. The remainder of the supporting workforce (other than motor vehicle parts manufacturing) is spread very thin across many industries, so even if trends exist in some of these industries, the effects on the analysis would be negligible. Regarding assumption 3, there were no clear trends (at the OEM level) in the American Automobile Labeling Act data of recent years.

Harbour Analysis – OEM Workforce Losses

Harbour gathered 2003 vehicle sales data for vehicles sold by GM, DCX, Ford and Nissan in states expected to adopt the CARB regulation. Based on the assumption that the affected OEMs would reduce Passenger Car / LDT1 sales by 75%, and LDT2 sales by 15% in states adopting AB 1493, Harbour translated these lost sales into production losses by vehicle model in the appropriate North American assembly plants[5] (these lost sales figures are shown in Table 1, Appendix A)

Harbour calculated lost OEM engine and transmission production based on the lost vehicle volume. Production losses were attributed to the appropriate plants, based on the specific engines and transmissions contained in the lost vehicles. For example, if there were a volume loss of 3,000 Jeep Liberty's, and 50% of those lost vehicles contained 2.4L I4 engines, the production of the 2.4L engine would go down by 1,500. This methodology is comparable for both Engine and Transmission data.

Domestic OEM stamping facilities are often centralized, with various body stampings going to many different vehicle assembly plants. There is no available data to associate stamped parts to specific vehicles. So instead of vehicle applications, we utilize the percentage change in volume at the company level, and apply that to all of the company's stamping facilities. For example, if after all vehicle volume adjustments GM has lost 10% of its Vehicle volume, the model assumes that there will be a 10% loss in volume of stamped parts at all GM stamping facilities.

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[5] In cases where vehicle models were produced in more than one plant, Harbour relied on its knowledge of the industry to extrapolate how losses would be allocated to appropriate plants. Vehicles imported from overseas would not be considered in the production losses, as they are not produced in North American plants.

When a manufacturing plant experiences production volume losses, measures are taken to minimize the effect on profitability. When volume loss is considerable or for a sustained duration, a plant will generally take steps to maximize efficiencies for the reduced production requirements. Slowing down an assembly line enables fewer workers to produce a reduced output (e.g. assemble fewer vehicles) over the same time period. This is referred to as "line rebalancing."

Similar concepts can be applied to optimize efficiency throughout other manufacturing processes. For example, stamping facility press operators could be rotated across presses, thus allowing some presses to remain idle for periods of time. Based on concepts such as these, plant managers have staffing plans to determine the manpower required for various output levels at their plant.

Harbour analyzed OEM-provided staffing data to determine the relationship between volume loss and plant workforce adjustments. The percent change in workforce is equal to the "employment ratio" multiplied by the percent volume change. The "employment ratios" are defined by division type (assembly, engine, transmission, stamping) and labor classification (hourly, salary). For example, say the Ford Atlanta plant experiences a 10% loss in volume. The percent change in hourly workforce is calculated by multiplying the change in volume (-10%) by the ratio (80%), equaling -8.0%. Thus, if there were 1000 hourly workers, 80 would be eliminated[6].

[6] The eliminated workers may be laid off, still receiving some portion of their pay, depending on the current labor contract. This would create a considerable cost burden for the affected OEMs, as they are still liable for the cost of the laid off workforce.

Table 4 - Employment Ratios

	Assembly	Engine	Transmission	Stamping
Hourly	0.80	0.90	0.90	0.90
Salary	0.45	0.40	0.40	0.50

Harbour developed a computer model which calculates the OEM plant jobs that would be removed by rebalancing for each plant (based on the defined employment ratios for the assumed production losses). However, rebalancing has associated costs (planning, moving equipment, etc.), so it is not always the appropriate solution.

If a volume loss is small or expected to be short in duration, a plant would simply reduce scheduled overtime (the computer model was designed to adjust for this). The next step would be to shut down production for a short period of time to help the plant avoid unnecessary operating costs and inventory surplus. If a volume loss is large, a plant may remove an entire shift (most plants generally run 2 or 3 shifts per day) instead of rebalancing the line in order to meet the reduced volume requirements. Below certain production levels, plants cannot operate profitably and would be forced to close.

Harbour analyzed the effects of volume loss and line rebalancing on a plant-by-plant basis, and determined where rebalancing would not be an optimal strategy. It was assumed that plants with production losses of less than 5% would temporarily halt production instead of rebalancing, and that plants with substantial volume loss (losses resulting in less than 60% capacity utilization for a 2-shift operation) would drop a shift. In rare cases, plants that could not operate profitably would be closed. In metal stamping, Harbour concluded that Ford and GM each would close one centralized plant rather than rebalancing across all of their plants.

Table 5 – OEM Workforce Loss by Company

COMPANY	U.S. Volume Loss	Total Volume Loss	U.S. Workforce Loss			U.S. Total Workforce Loss
			Line Rebalancing	Plant closings / dropped shifts	Non-Plant jobs	
GM	-230,461	-383,763	-4,668	-2,906	-2,166	-9,740
Ford	-228,825	-338,325	-3,865	-3,418	-2,151	-9,434
DCX	-79,558	-198,577	-1,116	251	-716	-1,580
Nissan	-51,445	-112,073	-368	-731	-252	-1,351
Mitsubishi	-44,155	-46,908	-525	-1,793	-233	-2,551
SIA	-30,279	-63,623	-417	0	-148	-565
Auto Alliance	-13,548	-13,548	-271	0	-66	-337
CAMI	0	-10,702	0	0	0	0
Grand Total	**-678,271**	**-1,167,519**	**-11,230**	**-8,597**	**-5,732**	**-25,558**

OEMs would also be expected to reduce non-plant jobs (engineering, sales / purchasing, administrative, etc.). The following table shows estimated OEM employment reductions in non-plant jobs. Reductions are based on the volume-based multipliers shown in the second column.

Table 6 – OEM U.S. Non-plant Workforce Loss detail

Staff Functions	Jobs per 100 vehicles	Auto Alliance	NUMMI	SIA	Mitsubishi	DCX	Nissan	Ford	GM	Total
Total Volume Loss		13,548	0	30,279	47,518	76,195	51,445	226,825	230,461	678,271
Product Design*	0.45	0	0	0	0	-343	0	-1,030	-1,037	**-2,410**
Manufacturing Staff	0.12	-16	0	-36	-57	-91	-62	-275	-277	**-814**
Purchasing / Sales	0.22	-30	0	-67	-105	-168	-113	-503	-507	**-1,492**
Other (HR, Finance, etc.)	0.15	-20	0	-45	-71	-114	-77	-343	-346	**-1,017**
Total		**-66**	**0**	**-148**	**-233**	**-716**	**-252**	**-2,151**	**-2,166**	**-5,733**

*U.S. Product Design jobs are assumed to be negligible for the non-Big 3 OEMS, as these jobs are typically located in Japan

Harbour Analysis – Indirect Workforce Losses

U.S. Bureau of Labor 2002 Employment Requirements Tables quantifies the number of employees across all industries that support the motor vehicle manufacturing industry. Table 2, Appendix A shows the number of employees by industry (NAICS code) that support $1 million of sales and converts this into employees per 100 vehicles based on the average number of vehicles per $1 million sales.

Average vehicle (factory) price
*$21,785 = 8% dealer margin * ($24,179 average consumer price[7] - $500 freight charge)*
Vehicles per $1,000,000 sales output
41.36 = $1,000,000 / $21,785 average price

All industries total 15.3 employees per 100 vehicles (less Motor Vehicle Manufacturing, which was measured with the OEM employment analysis). Table 7 shows the sales weighted percentages of domestic content per vehicle for each OEM. Company specific indirect jobs per 100 vehicles can then be calculated.

*Company Indirect Jobs per 100 Vehicles = (15.3 Industry Indirect Jobs per 100 Vehicles / 78.6% Total Industry domestic content) * Company Domestic content*

[7] Source: Edmunds

Table 7 – Sales-weighted domestic content company averages[8]

OEM	Domestic content*	Indirect Jobs per 100 vehicles
Chrysler	83.2%	16.2
Ford	85.0%	16.5
GM	82.1%	16.0
Honda	65.6%	12.8
Mazda	77.3%	15.1
Mitsubishi	60.0%	11.7
Nissan	55.9%	10.9
Subaru	50.0%	9.7
Toyota	59.2%	11.5
Total	**78.6%**	**15.3**

*Domestic content is based on overall company averages for domestically produced vehicles only (imports excluded)

The total loss of U.S. indirect jobs can be found by multiplying the U.S. volume loss by company and the OEM-specific indirect jobs per vehicle ratio. Adjustment is needed for vehicle distribution (freight, dealerships), which is not included in the BLS figures. Calculations using NADA data and NATLD data average 4 employees per 100 vehicles for distribution. (workforce losses are shown in Table 8)

6,100 (2003 Transportation Employees[9])
*677,940 = 1,129,900 * 60% (2003 Auto Dealership Employees[10], assuming 60% of employees support new vehicle sales)*
16,967,442 (2003 U.S. Vehicle Sales[11])

(6,100 + 677,940) / (16,967,442 / 100) = 4 distribution jobs per 100 vehicles

[8] Source: NHTSA American Automobile Labeling Act (AALA) data, Automotive News Market Data Book; provided by Automotive Trade Policy Council (ATPC); It should be noted that the AALA data considers both U.S. and Canadian content as domestic, however, assuming that the ratio of U.S. to Canadian content is consistent across OEMs, this would not have a significant effect on the calculations
[9] Source: National Automobile Transporters Labor Division (NATLD)
[10] Source: National Auto Dealers Association (NADA)
[11] Source: Ward's Automotive

TABLE 8 – Gross U.S. Workforce Loss by OEM

COMPANY[12]	U.S. Volume Loss	Total Volume Loss	OEM Workforce Loss	Indirect Workforce Loss	Distribution Workforce Loss	Total U.S. Workforce Loss
GM	-230,461	-383,763	-9,740	-36,839	-15,351	-61,929
Ford	-228,825	-338,325	-9,434	-37,869	-13,533	-60,836
DCX	-79,558	-198,577	-1,580	-12,888	-7,943	-22,411
Nissan	-51,445	-112,073	-1,351	-5,599	-4,483	-11,433
Mitsubishi	-44,155	-46,908	-2,551	-5,158	-1,876	-9,586
SIA	-30,279	-63,623	-565	-2,948	-2,545	-6,057
Auto Alliance	-13,548	-13,548	-337	-2,242	-542	-3,121
CAMI	0	-10,702	0	0	-428	-428
Honda	0	0	0	0	0	0
Toyota	0	0	0	0	0	0
Hyundai	0	0	0	0	0	0
	-678,271	**-1,167,519**	**-25,558**	**-103,543**	**-46,701**	**-175,802**

[12] GM includes Buick, Cadillac, Chevrolet, GMC, Oldsmobile, Pontiac, Saturn, Saab, and Suzuki (excluding NUMMI); Subaru is listed separately
Ford includes Ford, Lincoln, Jaguar, Aston Martin, Volvo, and Mazda (excluding Auto-Alliance)
DCX includes Chrysler, Dodge, Jeep, and Mercedes; Mitsubishi is listed separately

Harbour Analysis – Sources of Replacement Vehicles

If GM, DCX, Ford and Nissan cannot sell vehicles in regulated states at current levels and experience the sales losses noted in the Sierra Research study, this would represent a considerable number of lost sales. However, there is still demand for vehicles, so net losses are calculated after the unaffected OEMs[13] have made up most or all of this volume[14].

The first issue is to determine what volume will be made up by other OEMs. Consumers will be faced with substantially fewer vehicle models to choose from. Also, there will be price increases to cover the cost of redesigning vehicles to comply with the AB 1493 standards, and the reduction in supply of available vehicles. These factors would contribute to a loss of total vehicle sales, as prospective buyers may elect to keep their current vehicles longer or buying a used vehicle as opposed to a new one. Instead of estimating a specific sales loss figure, net losses are analyzed under four different scenarios of sales losses: 0% (all volume made up), 5%, 10%, and 20% sales losses.

Harbour assumes that unaffected OEMs will make up the lost sales volume proportionally to their 2003 market shares. For example, Honda accounted for 35% of the total 2003 U.S. passenger vehicle sales among the unaffected OEMs. Thus, it is assumed Honda will make up 35% of the replacement vehicle production.

[13] "Unaffected OEMs" refers to Honda, Toyota, and Hyundai. It is assumed Volkswagen would not be able to sell replacement vehicles

[14] All volume would not be made up if overall vehicle sales were lost

Harbour research indicates unaffected OEMs do not have available capacity to build all of these vehicles, so some new capacity would need to be built. An emerging market such as China potentially could provide the lowest total cost; however, a substantial amount of planning would be required to develop the requisite manufacturing infrastructure (supplier network, logistics, etc.). Also, there are political considerations, as domestic vehicle production is viewed more favorably by the U.S. public. There are no estimates for the percentage of vehicles that each company would import; instead net losses are analyzed for three different scenarios: using each OEM's current ratio of imports to domestically produced vehicles (see Table 9), and then using the current ratios plus and minus 20%.

TABLE 9 – Import ratios of unaffected OEMs[15]

	U.S. Sales	U.S. Production	Import ratio	Adjusted Import ratio[16]
Honda	1,349,847	845,313	37%	37%
Toyota	1,866,314	727,369	61%	55%
Hyundai	637,692	-	100%	60%

First, we calculated the number of new OEM plant jobs in assembly, engine, transmission and stamping based on the new capacity required to build the replacement vehicles. Plant flexibility is one significant advantage for the unaffected OEMs. Among Japanese OEMs, products and manufacturing processes follow a standard design that enables their plants to produce multiple models on the same production line with minimal investment. Traditional Big 3 plants tend to be platform specific (production is limited to models on the same platform); various vehicle models and their assembly processes vary considerably. Therefore, such plants require a relatively large (sometimes cost-prohibitive) investment for redesign and retooling to produce a different product. This

[15] Source: Automotive News 2004 Market Data book (2003 calendar year data)
[16] Adjusted import ratios account for new facilities currently under construction (Hyundai plant in Alabama, Toyota plant in Texas)

flexibility advantage enables Japanese OEMs to produce more vehicles in fewer plants. For example, a traditional Big 3 OEM may have three plants that each produce one specific model. The Big 3 OEM would need to operate all three plants to produce all three models, even if each plant is running at 33% capacity. A Japanese OEM would generally have the capability to produce all three models at any one of their plants and could shut down the other two plants to save fixed costs and resources associated with the two excess plants. Therefore, the workforce created by replacement vehicles produced at Japanese OEM plants would be substantially less than the workforce lost due to production losses at Big 3 plants.

Second, we estimate the number of non-plant jobs that would be created based on the production of replacement vehicles (using the same methodology shown in Table 6). There is considerable disparity in the proportion of non-plant jobs between traditional Big 3 and Japanese OEMs in the U.S., particularly in product design. The majority of Big 3 non-plant jobs are located in the U.S. Japanese OEMs have some non-plant jobs in the U.S., but many tend to be overseas. Again, the workforce created by the replacement vehicle production would be substantially less than the workforce cut due to the original volume loss.

Finally, we calculate the number of indirect and distribution jobs that would be created based on production of replacement vehicles. The methodology is consistent with the calculation used to determine the loss of indirect and distribution workforce based on volume loss. The number of indirect jobs created is based on the replacement vehicles produced and the average domestic content percentages of the OEMs that produce them. Because domestically produced vehicles of foreign-owned OEMs generally

contain lower amounts of domestic content, the indirect workforce created by replacement vehicle production would be substantially less than the workforce cut due to the original volume loss. Distribution jobs are very straightforward; the jobs per 100 vehicles sold is equal across all companies, whether vehicles are imported or produced domestically. However, a volume loss caused by reduced consumer choice / increased prices reduces the number of distribution jobs accordingly.

The following table summarizes the workforce created by the production of replacement vehicles based on the different scenarios analyzed.

TABLE 10 – Net Workforce Loss scenarios

% of replacement vehicles imported		% of vehicle sales lost			
		20%	10%	5%	0%
20% higher import ratios	New U.S. Production	376,250	423,281	446,797	470,312
	New Plant Jobs	4,987	5,610	5,922	6,234
	New OEM Non-Plant Jobs	1,844	2,074	2,189	2,305
	New Indirect Jobs	44,529	50,095	52,878	55,661
	New Distribtion Jobs	37,361	42,031	44,366	46,701
	Net Change in U.S. Production	-302,021	-254,990	-231,474	-207,959
	Net Change in Jobs	-87,082	-75,992	-70,447	-64,902
current import ratios	New U.S. Production	470,312	529,101	558,496	587,890
	New Plant Jobs	6,234	7,013	7,403	7,792
	New OEM Non-Plant Jobs	2,305	2,593	2,737	2,881
	New Indirect Jobs	55,661	62,618	66,097	69,576
	New Distribtion Jobs	37,361	42,031	44,366	46,701
	Net Change in U.S. Production	-207,959	-149,170	-119,775	-90,381
	Net Change in Jobs	-74,242	-61,547	-55,200	-48,852
20% lower import ratios	New U.S. Production	564,375	634,921	670,195	705,468
	New Plant Jobs	7,481	8,416	8,883	9,351
	New OEM Non-Plant Jobs	2,765	3,111	3,284	3,457
	New Indirect Jobs	66,793	75,142	79,316	83,491
	New Distribtion Jobs	37,361	42,031	44,366	46,701
	Net Change in U.S. Production	-113,896	-43,350	-8,076	27,197
	Net Change in Jobs	-61,402	-47,102	-39,953	-32,803

*Hyundai did not produce vehicles in the U.S. as of 2003, this scenario estimates the domestic content of U.S. produced Hyundai vehicles at 50%

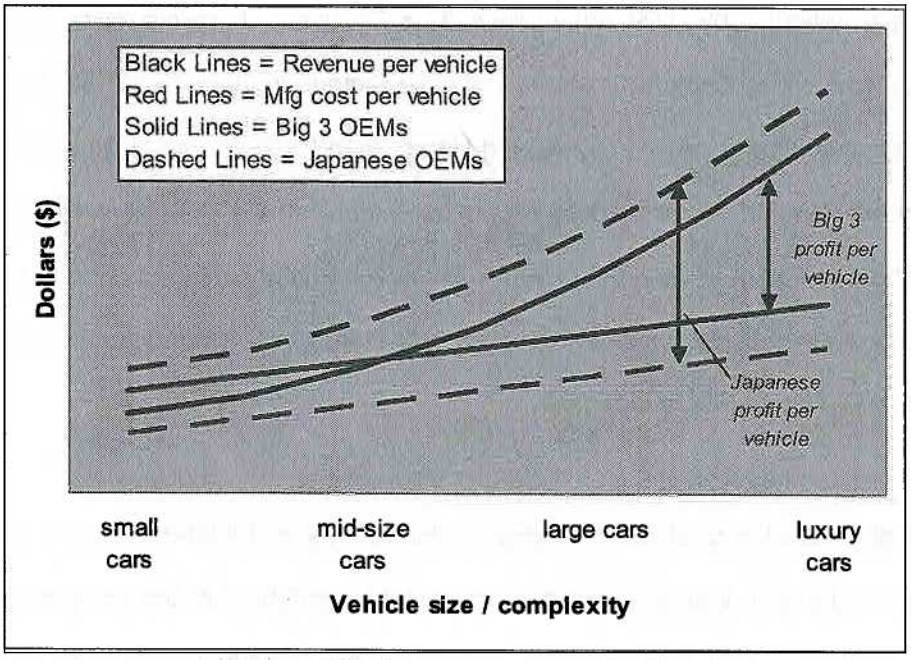
Harbour Analysis – Conclusion

The AB 1493 rule in California and other states will have dramatic effects on the North American automotive market. The regulations affect the manufacturers in disproportionate degrees and have both immediate and far reaching effects on domestic vehicle production and the employment it supports. According to a conservative estimate, there is a net loss of over 55,000 U.S. jobs. This estimate assumes that the OEMs producing the replacement vehicles will produce the majority of the vehicles domestically (proportional to their current domestic production). There are some important factors to consider: the costs of manufacturing vehicles in Canada or Mexico is significantly lower than in the U.S. (in Canada labor wages are somewhat lower than in the U.S. and health care costs are provided by the government, and in Mexico labor wages are much lower than in the U.S.); also, there is the increasing viability of emerging markets – by 2009, added capacity in China could provide more cost-effective imports than either Canada or Mexico. These factors could push the net loss of U.S. jobs closer to 90,000. Also, Toyota and Honda tend to keep their U.S. capacity a step behind the demand. Even if these OEMs build replacement vehicles in the U.S., there would be a period of several years before the new manufacturing jobs would be created. But regardless of these uncertainties, it is clear that the implementation of AB 1493 will lead to a significant loss in U.S. jobs.

Ultimately, reducing production volumes of larger cars and light-duty trucks in the U.S. market will have a dramatic impact on the overall profitability of the companies most in those markets. This has particular impact on the already fragile profit situation of domestic automakers. Domestic manufacturers generally have a higher cost base due

to legacy costs (retiree health and pensions), higher new vehicle capital investment, worker labor productivity, higher warranty cost, and numerous other factors. These issues make profit difficult on smaller or medium size cars (see Figure A). Limiting product mix to these segments of the market, in addition to the costs of new technology and liability costs of laid-off employees, will result in a very significant loss for domestic automakers and severely jeopardize their long-term viability. The previously calculated figures for lost U.S. jobs would pale in comparison to the losses that would occur if one (or more) of the Big 3 OEMs were faced with bankruptcy. And this scenario is not unrealistic; given the tenuous financial state that GM and Ford currently face, imposing AB 1493 could be the breaking point.

FIGURE A – OEM profit per vehicle



The implementation of this regulation poses several controversial questions: Can States indirectly impose fuel economy standards by establishing aggressive emissions regulations? Will aggressive standards accelerate the development of new or partially mature technologies by private industry? If the technology can meet the standard, will customers pay the increased cost or should they be expected to? If the law effectively eliminates the choice of a full range of vehicle sizes (larger cars), should consumers be forced to accept such limitations?

APPENDIX A

TABLE 1 – Lost Passenger Car / LDT1 / LDT2 Sales by Model in affected States (California, New York, Massachusetts, Maine, Vermont, Connecticut, New Jersey, and Rhode Island)[17]

Parent	Make	Model	Volume
DCX	CHRYSLER	300 M	3,123
DCX	CHRYSLER	CONCORDE	2,251
DCX	CHRYSLER	PT CRUISER	27,539
DCX	CHRYSLER	SEBRING	1,878
DCX	CHRYSLER	SEBRING 4-DR	2,116
DCX	CHRYSLER	SEBRING CONVERTIBLE	2,941
DCX	DODGE	DAKOTA PICKUP 4WD	351
DCX	DODGE	DURANGO 4WD	2,431
DCX	DODGE	INTREPID	6,569
DCX	DODGE	RAM 1500 PICKUP 2WD	40,093
DCX	DODGE	RAM 1500 PICKUP 4WD	11,551
DCX	DODGE	RAM VAN 2500 2WD	950
DCX	DODGE	STRATUS 2-DR	1,485
DCX	DODGE	STRATUS 4-DR	1,644
DCX	DODGE	VIPER CONVERTIBLE	360
DCX	JEEP	WRANGLER 4WD	15,068
DCX	MERCEDES	C240	14,343
DCX	MERCEDES	C32 AMG	658
DCX	MERCEDES	C320	5,181
DCX	MERCEDES	C320 WAGON	1,677
DCX	MERCEDES	CL500	1,380
DCX	MERCEDES	CL55 AMG	223
DCX	MERCEDES	CL600	287
DCX	MERCEDES	CLK320	2,034
DCX	MERCEDES	CLK320 (CABRIOLET)	2,481
DCX	MERCEDES	CLK430	2,070
DCX	MERCEDES	CLK430 (CABRIOLET)	1,965
DCX	MERCEDES	E320	16,306
DCX	MERCEDES	E320 (WAGON)	289
DCX	MERCEDES	E320 4MATIC	5,668
DCX	MERCEDES	E320 4MATIC (WAGON)	429
DCX	MERCEDES	E500	9,351
DCX	MERCEDES	S430	6,351
DCX	MERCEDES	S500	4,107

[17] Source: R.L. Polk Automotive Intelligence; provided by Sierra Research

Parent	Make	Model	Volume
DCX	MERCEDES	S55 AMG	590
DCX	MERCEDES	S600	393
DCX	MERCEDES	SL500	9,136
DCX	MERCEDES	SLK230 KOMPRESSOR	1,437
DCX	MERCEDES	SLK32 AMG	1,097
DCX	MERCEDES	SLK320	268
DCX	MERCEDES	G500	1,208
DCX	MITSUBISHI	DIAMANTE SEDAN	2,753
DCX	MITSUBISHI	ECLIPSE	6,406
DCX	MITSUBISHI	ECLIPSE GT	6,485
DCX	MITSUBISHI	ECLIPSE SPYDER	6,060
DCX	MITSUBISHI	GALANT	25,204
FORD	ASTON MARTIN	ASTON MARTIN VANQUISH	131
FORD	ASTON MARTIN	DB-7 VANTAGE COUPE	38
FORD	ASTON MARTIN	DB-7 VANTAGE VOLANTE	88
FORD	FORD	CROWN VICTORIA	25,002
FORD	FORD	E150 ECONOLINE 2WD	8,617
FORD	FORD	E250 ECONOLINE 2WD	1,284
FORD	FORD	EXPEDITION 4WD	19,923
FORD	FORD	F150 PICKUP 2WD 3.55 RAR	13,179
FORD	FORD	FOCUS 5-DR HATCHBACK	693
FORD	FORD	MUSTANG	27,484
FORD	FORD	RANGER PICKUP 2WD	27,871
FORD	FORD	TAURUS LX	52,817
FORD	FORD	TAURUS LX WAGON	3,250
FORD	FORD	TAURUS SE	13,421
FORD	FORD	TAURUS SE WAGON	484
FORD	FORD	THUNDERBIRD	3,483
FORD	JAGUAR	JAGUAR S-TYPE 3.0 LITRE	5,377
FORD	JAGUAR	JAGUAR S-TYPE 4.2 LITRE	2,915
FORD	JAGUAR	JAGUAR SUPER V8	46
FORD	JAGUAR	JAGUAR VANDEN PLAS	370
FORD	JAGUAR	JAGUAR XJ SPORT	226
FORD	JAGUAR	JAGUAR XJ8	1,498
FORD	JAGUAR	JAGUAR XJR	365
FORD	JAGUAR	JAGUAR XK8 CONVERTIBLE	697
FORD	JAGUAR	JAGUAR XKR CONVERTIBLE	265
FORD	JAGUAR	JAGUAR X-TYPE	11,195
FORD	LAND ROVER	DISCOVERY	8,912
FORD	LAND ROVER	RANGE ROVER	6,085
FORD	LINCOLN	GRAND MARQUIS	19,220
FORD	LINCOLN	LS	6,522
FORD	LINCOLN	NAVIGATOR 2WD	6,770
FORD	LINCOLN	NAVIGATOR 4WD	6,811
FORD	LINCOLN	SABLE GS	8,975
FORD	LINCOLN	SABLE GS WAGON	410

Parent	Make	Model	Volume
FORD	LINCOLN	SABLE LS	5,951
FORD	LINCOLN	SABLE LS WAGON	1,030
FORD	LINCOLN	TOWN CAR	17,832
FORD	MAZDA	B2300 2WD	1,855
FORD	MAZDA	B3000 2WD	856
FORD	MAZDA	MAZDA6 I	7,861
FORD	MAZDA	MAZDA6 S	5,687
FORD	MAZDA	MX-5 MIATA	3,016
FORD	MAZDA	SPEED PROTÉGÉ	760
FORD	VOLVO	C70 CONVERTIBLE	257
FORD	VOLVO	S40	3,566
FORD	VOLVO	S60	3,525
FORD	VOLVO	S60 AWD	1,092
FORD	VOLVO	S60 TURBO	3,526
FORD	VOLVO	S80/S80 EXECUTIVE	2,827
FORD	VOLVO	V40	975
FORD	VOLVO	V70	1,933
FORD	VOLVO	V70 TURBO	4,900
GM	BUICK	CENTURY	33,519
GM	BUICK	LESABRE CUSTOM	23,119
GM	BUICK	PARK AVENUE	4,071
GM	BUICK	PARK AVENUE ULTRA	562
GM	BUICK	REGAL GS	1,390
GM	BUICK	REGAL LS	8,206
GM	CADILLAC	CTS	16,824
GM	CADILLAC	DEVILLE	14,917
GM	CADILLAC	ESCALADE AWD	11,130
GM	CADILLAC	ESCALADE EXT AWD	2,926
GM	CADILLAC	SEVILLE	4,653
GM	CHEVROLET	AVALANCHE 1500 2WD	4,792
GM	CHEVROLET	CORVETTE	8,091
GM	CHEVROLET	IMPALA	46,401
GM	CHEVROLET	MALIBU	39,406
GM	CHEVROLET	MONTE CARLO	12,256
GM	CHEVROLET	S10 PICKUP 2WD	19,045
GM	CHEVROLET	TAHOE 1500 4WD LT	20,071
GM	CHEVROLET	TRACKER 4WD CONVERTIBLE	4,098
GM	CHEVROLET	TRACKER 4WD HARDTOP	1,886
GM	CHEVROLET	TRACKER CONVERTIBLE	1,067
GM	CHEVROLET	TRACKER HARDTOP	1,168
GM	GMC	C1500 YUKON XL 2WD	4,431
GM	GMC	K1500 SIERRA DENALI AWD	1,371
GM	GMC	K1500 YUKON DENALI AWD	5,515
GM	GMC	K1500 YUKON DENALI XL AWD	5,458
GM	GMC	SONOMA 2WD	5,190
GM	OLDSMOBILE	ALERO	8,964

Parent	Make	Model	Volume
GM	OLDSMOBILE	AURORA	411
GM	PONTIAC	BONNEVILLE	4,953
GM	PONTIAC	BONNEVILLE SC	705
GM	PONTIAC	GRAND AM	10,290
GM	PONTIAC	GRAND PRIX	11,493
GM	PONTIAC	GRAND PRIX SC	2,269
GM	SAAB	SAAB 9-3 CONVERTIBLE	3,328
GM	SAAB	SAAB 9-3 SPORT SEDAN	10,100
GM	SAAB	SAAB 9-5	4,009
GM	SAAB	SAAB 9-5 WAGON	1,911
GM	SATURN	L200	14,602
GM	SATURN	L300	4,390
GM	SATURN	LW200	1,207
GM	SATURN	LW300	1,085
GM	SUBARU	FORESTER AWD	24,882
GM	SUBARU	IMPREZA AWD	4,259
GM	SUBARU	IMPREZA WAGON AWD	4,203
GM	SUBARU	LEGACY/OUTBACK AWD	5,318
GM	SUBARU	LEGACY/OUTBACK WAGON AWD	24,961
GM	SUZUKI	GRAND VITARA	579
GM	SUZUKI	GRAND VITARA 4WD	1,026
GM	SUZUKI	VITARA 2-DOOR	42
GM	SUZUKI	VITARA 2-DOOR 4WD	46
GM	SUZUKI	VITARA 4-DOOR	483
GM	SUZUKI	VITARA 4-DOOR 4WD	307
NISSAN	INFINITI	FX45 AWD	3,054
NISSAN	INFINITI	G35	31,951
NISSAN	INFINITI	I35	7,184
NISSAN	INFINITI	M45	2,576
NISSAN	INFINITI	Q45	1,292
NISSAN	INFINITI	QX4 4WD	2,279
NISSAN	NISSAN	350Z	12,292
NISSAN	NISSAN	ALTIMA	12,022
NISSAN	NISSAN	FRONTIER 2WD	6,466
NISSAN	NISSAN	FRONTIER V6-2WD	6,990
NISSAN	NISSAN	FRONTIER V6-2WD SC	257
NISSAN	NISSAN	FRONTIER V6-4WD SC	1,525
NISSAN	NISSAN	MAXIMA	20,912
NISSAN	NISSAN	XTERRA V6-2WD SC	789
NISSAN	NISSAN	XTERRA V6-4WD SC	2,484

TABLE 2 – 2002 Employment Requirements data for NAICS code 3361 (motor vehicle manufacturing)[18]

NAICS code	Industry description	Employees per $1M sales output	Indirect Employees per 100 vehicles
111,112	Agricultural products	0.0165	0.04
1131-2, 114	Forestry, fishing, hunting, and trapping	0.0020	0.00
1133	Logging	0.0031	0.01
115	Support activities for agriculture and forestry	0.0018	0.00
211	Oil and gas extraction	0.0044	0.01
2121	Coal mining	0.0051	0.01
2122	Metal ore mining	0.0086	0.02
2123	Nonmetallic mineral mining and quarrying	0.0052	0.01
2131	Support activities for mining	0.0021	0.00
2211	Electric power generation, transmission, and distribution	0.0174	0.04
2212	Natural gas distribution	0.0045	0.01
2213	Water, sewage, and other systems	0.0006	0.00
562	Waste management and remediation services	0.0201	0.04
23	Construction	0.0415	0.09
3111	Animal food manufacturing	0.0007	0.00
3112	Grain and oilseed milling	0.0006	0.00
3113	Sugar and confectionery product manufacturing	0.0002	0.00
3114	Fruit and vegetable preserving and specialty food manufacturing	0.0005	0.00
3115	Dairy product manufacturing	0.0005	0.00
3116	Animal slaughtering and processing	0.0040	0.01
3117	Seafood product preparation and packaging	0.0003	0.00
3118	Bakeries and tortilla manufacturing	0.0020	0.00
3119	Other food manufacturing	0.0004	0.00
3121	Beverage manufacturing	0.0005	0.00
3122	Tobacco manufacturing	0.0000	0.00
3131	Fiber, yarn, and thread mills	0.0066	0.01
3132	Fabric mills	0.0224	0.05
3133	Textile and fabric finishing and fabric coating mills	0.0150	0.03
3141	Textile furnishings mills	0.0103	0.02
3149	Other textile product mills	0.0148	0.03
3151	Apparel knitting mills	0.0002	0.00
3152	Cut and sew apparel manufacturing	0.0017	0.00
3159	Apparel accessories and other apparel manufacturing	0.0006	0.00
3161	Leather and hide tanning and finishing	0.0092	0.02
3162	Footwear manufacturing	0.0001	0.00

[18] Source: U.S. Bureau of Labor Statistics

NAICS code	Industry description	Employees per $1M sales output	Indirect Employees per 100 vehicles
3169	Other leather and allied product manufacturing	0.0004	0.00
3211	Sawmills and wood preservation	0.0037	0.01
3212	Veneer, plywood, and engineered wood product manufacturing	0.0019	0.00
3219	Other wood product manufacturing	0.0097	0.02
3221	Pulp, paper, and paperboard mills	0.0079	0.02
3222	Converted paper product manufacturing	0.0258	0.06
3231	Printing and related support activities	0.0374	0.08
3241	Petroleum and coal products manufacturing	0.0042	0.01
3251	Basic chemical manufacturing	0.0124	0.03
3252	Resin, synthetic rubber, and artificial synthetic fibers andfilaments manufacturing	0.0153	0.03
3253	Pesticide, fertilizer, and other agricultural chemical manufacturing	0.0006	0.00
3254	Pharmaceutical and medicine manufacturing	0.0023	0.01
3255	Paint, coating, and adhesive manufacturing	0.0238	0.05
3256	Soap, cleaning compound, and toilet preparation manufacturing	0.0018	0.00
3259	Other chemical product and preparation manufacturing	0.0076	0.02
3261	Plastics product manufacturing	0.0897	0.20
3262	Rubber product manufacturing	0.0804	0.18
3271	Clay product and refractory manufacturing	0.0079	0.02
3272	Glass and glass product manufacturing	0.0467	0.10
3273	Cement and concrete product manufacturing	0.0035	0.01
3274	Lime and gypsum product manufacturing	0.0011	0.00
3279	Other nonmetallic mineral product manufacturing	0.0072	0.02
3311	Iron and steel mills and ferroalloy manufacturing	0.0499	0.11
3312	Steel product manufacturing from purchased steel	0.0243	0.05
3313	Alumina and aluminum production and processing	0.0241	0.05
3314	Nonferrous metal (except aluminum) production and processing	0.0152	0.03
3315	Foundries	0.1442	0.31
3321	Forging and stamping	0.0379	0.08
3322	Cutlery and handtool manufacturing	0.0022	0.00
3323	Architectural and structural metals manufacturing	0.0483	0.11
3324	Boiler, tank, and shipping container manufacturing	0.0042	0.01
3325	Hardware manufacturing	0.0219	0.05
3326	Spring and wire product manufacturing	0.0316	0.07
3327	Machine shops; turned product; and screw, nut, and bolt manufacturing	0.1576	0.34
3328	Coating, engraving, heat treating, and allied activities	0.0372	0.08
3329	Other fabricated metal product manufacturing	0.0455	0.10
3331	Agriculture, construction, and mining machinery manufacturing	0.0022	0.00

NAICS code	Industry description	Employees per $1M sales output	Indirect Employees per 100 vehicles
3332	Industrial machinery manufacturing	0.0022	0.00
3333	Commercial and service industry machinery manufacturing	0.0017	0.00
3334	Ventilation, heating, air-conditioning, and commercial refrigeration equipment manufacturing	0.0172	0.04
3335	Metalworking machinery manufacturing	0.0077	0.02
3336	Engine, turbine, and power transmission equipment manufacturing	0.0800	0.17
3339	Other general purpose machinery manufacturing	0.0213	0.05
3341	Computer and peripheral equipment manufacturing	0.0071	0.02
3342	Communications equipment manufacturing	0.0036	0.01
3343	Audio and video equipment manufacturing	0.0161	0.04
3344	Semiconductor and other electronic component manufacturing	0.0797	0.17
3345	Navigational, measuring, electromedical, and control instruments manufacturing	0.0309	0.07
3346	Manufacturing and reproducing magnetic and optical media	0.0022	0.00
3351	Electric lighting equipment manufacturing	0.0135	0.03
3352	Household appliance manufacturing	0.0005	0.00
3353	Electrical equipment manufacturing	0.0153	0.03
3359	Other electrical equipment and component manufacturing	0.0129	0.03
3361	Motor vehicle manufacturing	1.2134	2.64
3362	Motor vehicle body and trailer manufacturing	0.1233	0.27
3363	Motor vehicle parts manufacturing	1.3401	2.92
3364	Aerospace product and parts manufacturing	0.0049	0.01
3365	Railroad rolling stock manufacturing	0.0007	0.00
3366	Ship and boat building	0.0008	0.00
3369	Other transportation equipment manufacturing	0.0031	0.01
3371	Household and institutional furniture and kitchen cabinet manufacturing	0.0053	0.01
3372	Office furniture (including fixtures) manufacturing	0.0003	0.00
3379	Other furniture related product manufacturing	0.0004	0.00
3391	Medical equipment and supplies manufacturing	0.0023	0.00
3399	Other miscellaneous manufacturing	0.0083	0.02
42	Wholesale trade	0.6327	1.38
44-45	Retail trade	0.4942	1.08
481	Air transportation	0.0386	0.08
482	Rail transportation	0.0236	0.05
483	Water transportation	0.0015	0.00
484, 492	Truck transportation and couriers and messengers	0.2790	0.61
485	Transit and ground passenger transportation	0.0100	0.02
486	Pipeline transportation	0.0015	0.00

NAICS code	Industry description	Employees per $1M sales output	Indirect Employees per 100 vehicles
487,488	Scenic and sightseeing transportation and support activitiesfor transportation	0.0383	0.08
491	Postal Service	0.0333	0.07
493	Warehousing and Storage	0.0856	0.19
5111	Newspaper, periodical, book, and directory publishers	0.0280	0.06
5112	Software publishers	0.0010	0.00
516, 518, 519	Internet services, data processing, and other information services	0.0442	0.10
512	Motion picture and sound recording Industries	0.0088	0.02
5151	Radio and television broadcasting	0.0140	0.03
5152, 5175	Cable and other subscription programming and program distribution	0.0031	0.01
517, except 5175	Telecommunications, except cable and other programming distribution	0.0437	0.10
521, 5221	Monetary authorities and depository credit intermediation	0.0572	0.12
5222, 5223,525, 533	Nondepository credit intermediation and related support activities, funds, trusts, and lessors of nonfinancia	0.0850	0.19
523	Securities, commodity contracts, and other financial investments and related activities	0.0457	0.10
5241	Insurance carriers	0.0170	0.04
5242	Agencies, brokerages, and other insurance related activities	0.0099	0.02
531	Real estate	0.0431	0.09
5321	Automotive equipment rental and leasing	0.0090	0.02
53,225,323	Consumer goods rental and general rental centers	0.0093	0.02
5324	Commercial and industrial machinery and equipment rental andleasing	0.0062	0.01
5411	Legal services	0.0405	0.09
5412	Accounting, tax preparation, bookkeeping, and payroll services	0.0626	0.14
5413	Architectural, engineering, and related services	0.0941	0.21
5414	Specialized design services	0.0847	0.18
5415	Computer systems design and related services	0.0203	0.04
5416	Management, scientific, and technical consulting services	0.0615	0.13
5417, 5419	Scientific research and development and other professional,scientific, and technical services	0.1720	0.37
5418	Advertising and related services	0.0357	0.08
551	Management of companies and enterprises	0.2334	0.51
5611, 2	Office administrative and facilities support services	0.0170	0.04
5613	Employment services	0.1717	0.37
5614, 5616, 5619	Business support and investigation and security services andsupport services, nec	0.1055	0.23

NAICS code	Industry description	Employees per $1M sales output	Indirect Employees per 100 vehicles
5615	Travel arrangement and reservation services	0.0142	0.03
5617	Services to buildings and dwellings	0.0900	0.20
61	Educational services	0.0273	0.06
6211-3	Offices of health practitioners	0.0003	0.00
6214-6,6219	Ambulatory health care services except offices of health practitioners	0.0019	0.00
622	Hospitals	0.0004	0.00
6231-2	Nursing care and residential mental health facilities	0.0001	0.00
6233, 6239	Community care facilities for the elderly and residential care facilities, nec	0.0000	0.00
6241-3	Individual, family, community, and vocational rehabilitationservices	0.0001	0.00
6244	Child day care services	0.0000	0.00
7111, 7113-5	Performing arts companies, promoters, agents, managers and independent artists	0.0126	0.03
7112	Spectator sports	0.0041	0.01
712	Museums, historical sites, and similar institutions	0.0001	0.00
713	Amusement, gambling, and recreation industries	0.0132	0.03
7211	Traveler accommodation	0.0660	0.14
7212-3	RV parks, recreational camps, and rooming and boarding houses	0.0002	0.00
722	Food services and drinking places	0.0532	0.12
8111	Automotive repair and maintenance	0.4033	0.88
8112	Electronic and precision equipment repair and maintenance	0.0087	0.02
8113	Commercial and industrial equipment (except automotive and electronic) repair and maintenance	0.0261	0.06
8114	Personal and household goods repair and maintenance	0.0051	0.01
8121	Personal care services	0.0000	0.00
8122	Death care services	0.0000	0.00
8123	Drycleaning and laundry services	0.0095	0.02
8129	Other Personal Services	0.0027	0.01
8131-3	Religious, grantmaking and giving services, and social advocacy organizations	0.0001	0.00
81,348,139	Civic, social, business, and similar organizations	0.0281	0.06
814	Private households	0.0000	0.00
NA	Federal electric utilities	0.0012	0.00
NA	Federal government enterprises, nec	0.0015	0.00
NA	Federal general government	0.0005	0.00
NA	Federal government capital services	0.0000	0.00
NA	Local government passenger transit	0.0052	0.01
NA	State and local electric utilities	0.0039	0.01
NA	State and local government enterprises	0.0155	0.03

NAICS code	Industry description	Employees per $1M sales output	Indirect Employees per 100 vehicles
NA	State and local government hospitals	0.0001	0.00
NA	State and local government education	0.0011	0.00
NA	State and local general government, nec	0.0008	0.00
NA	State and local government capital services	0.0000	0.00
NA	Royalties	0.0000	0.00
NA	Owner-occupied dwellings	0.0000	0.00
NA	Noncomparable imports	0.0000	0.00
NA	Scrap, used and secondhand goods	0.0000	0.00
NA	Rest of the world industry	0.0000	0.00
NA	Inventory valuation adjustment	0.0000	0.00
NA	Total	8.2356	17.94
NA	Total less Motor Vehicle Manufacturing (NAICS 3361)	7.0223	15.30

DAIMLERCHRYSLER

April 12, 2006

Secretary Kathleen A. McGinty
Pennsylvania Department of Environmental Protection
Rachel Carson State Office Building
400 Market Street
Harrisburg, PA 17101
E-mail: RegComments@state.pa.us

Re: **DaimlerChrysler Comments on Rulemaking to Consider Adoption of Motor Vehicle Greenhouse Gas Regulations in Pennsylvania**

Dear Secretary McGinty:

This letter and its attachments transmit the comments of DaimlerChrysler Corporation ("DaimlerChrysler") on Pennsylvania's Environmental Quality Board's proposal to adopt California's Greenhouse Gas (GHG) exhaust emission standards and test procedures for passenger cars, light-duty trucks and medium-duty passenger vehicles as an amendment to Chapter 126, Subchapter D of Pennsylvania's Clean Vehicles Program. DaimlerChrysler is a member of the Alliance of Automobile Manufacturers ("the Alliance"). DaimlerChrysler supports and incorporates by reference the comments filed by the Alliance and by Sierra Research, Inc. on the Environmental Quality Board's proposal.

DaimlerChrysler is aggressively pursuing fuel efficiency improvements while striving to meet the needs and desires of our consumers in a highly competitive marketplace. We are investing billions of dollars to develop and introduce breakthrough technologies that in the long term will produce significant fuel economy gains and reduce greenhouse gas emissions from motor vehicles. While DaimlerChrysler shares the goal of increasing fuel efficiency (i.e., reducing greenhouse gases), we do not support the proposed regulatory amendment currently under consideration by the Environmental Quality Board for the following reasons:

1) The proposed regulation sets fuel economy levels that cannot be achieved using technology in the time periods required, without significant reductions in product offerings for Pennsylvania consumers. The customers of full line manufacturers like DaimlerChrysler, whose market mix is focused towards larger vehicles, would be the most negatively affected by the proposed rule.

2) The proposed regulation would have no measurable impact on the global climate or the climate of Pennsylvania or on the public health concerns and issues described in the Regulatory Impact Statement that accompanied the rulemaking proposal.

3) Contrary to its intent, the proposed regulation would increase ozone-forming pollutants in Pennsylvania, in conflict with the State's efforts to improve air quality and its State Implementation Plans for ozone.

4) An attached, separate study concluded the proposed rule would reduce employment in the automobile industry nationwide at manufacturing, supplier and distribution facilities once the regulation would be fully implemented. DaimlerChrysler has 996 employees, 267 dealers and 437 suppliers in Pennsylvania.

5) Federal law prohibits states from adopting or enforcing a law or regulation related to fuel economy. This point was reaffirmed on April 26, 2006 by the National Highway Traffic Safety Administration in its final fuel economy rule for trucks (Federal Register Vol 71, No. 66, pg 17664):,

   "California's Regulation of Greenhouse Gas/Carbon Dioxide Equivalent Emissions From Motor Vehicles Is Related to Average Fuel Economy Standards for Motor Vehicles Under 49 U.S.C. Chapter 329 and Therefore Preempted"

   The U.S. Congress reserved the issue of regulating vehicle fuel economy to the federal government to balance the attendant economic and safety issues. Greenhouse gas control requires coordinated international efforts, using policies set for this country at the national level, rather than through a patchwork of state regulations.

DaimlerChrysler supports the world-wide effort to reduce energy consumption and address the issue of climate change. We call on Pennsylvania and California to focus their efforts in support of existing national programs.

Reginald Modlin
Director-Environmental and Energy Planning
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Auburn Hills, MI 48326-2757
Phone: (248) 576-8076

DaimlerChrysler Corporation Comments On Rulemaking to Consider Adoption of Motor Vehicle Greenhouse Gas Regulations in Pennsylvania

DaimlerChrysler Corporation ("DaimlerChrysler") respectfully submits these comments on the proposal by Pennsylvania's Environmental Quality Board to adopt and enforce the motor vehicle greenhouse gas regulations approved by the California Air Resources Board ("ARB") in September 2004. DaimlerChrysler is a member of the Alliance of Automobile Manufacturers ("the Alliance") and supports the comments on the Environmental Quality Board's proposal that the Alliance has filed. DaimlerChrysler has also reviewed and supports the comments that Sierra Research, Inc., has filed on the environmental consequences of the California rule in Pennsylvania.

These comments have three parts. Part I provides background on some important technological issues in the California rulemaking that the Environmental Quality Board must address in considering the ARB rule. Part II discusses the effect of the ARB rule on consumers. Part III provides an estimate of the effect of the California rule on employment in the automotive industry. Attached to Part III is an analysis of the impact of the California rule on nationwide employment in the automobile industry prepared by Harbour Consulting, Inc.

I. Background

Virtually all greenhouse gas emissions from vehicles are tailpipe CO_2 emissions. According to the ARB analysis on which the current proposal for Pennsylvania is based, tailpipe CO_2 emissions are 97 percent of vehicle greenhouse gas emissions. Reducing vehicle CO_2 emissions is therefore synonymous with increasing fuel economy.

Fuel efficiency is the measure of how efficiently a vehicle uses energy to achieve the objectives of a vehicle operator. Fuel efficiency gains can and frequently are used to accomplish goals other than higher fuel economy. Many customers want to achieve increased towing or hauling capacity, better acceleration, improved safety, or expanded size or utility, even if those goals mean that a vehicle does not maximize fuel economy. Ultimately, consumers decide how to apply the benefits of improved fuel efficiency. To the extent that a greenhouse gas standard mandates specific fuel economy levels, it can limit consumer choice.

DaimlerChrysler has evaluated the technology forecast on which the ARB rule is based. ARB's technology assessment is incorrect for several fundamental reasons, including the following:

1. Some of the technologies identified by the ARB staff have technical obstacles that must still be overcome before they are feasible for high volume production in the near and mid term time frame (e.g., camless valve actuation and homogeneous charge compression ignition for either gasoline or diesel).

2. In many cases the ARB estimates of the costs of the feasible technologies are too low (e.g., turbocharging and downsizing) and the estimates of the benefits of technology are too high (e.g., variable valve lift and timing).

3. In all cases, ARB staff has made unrealistic assumptions about the ability of manufacturers to implement technologies in a timeframe that does not respect the

normal product development and life cycle planning crucial to the financial health of the automobile industry and the affordability of our products for consumers.

4. Even if all of the technical concerns could be overcome, and if the engineering resources were available for the industry to make sweeping changes to its product line in a short time frame, Pennsylvania consumers would pay far more for their new cars and trucks than they would ever recoup in future fuel savings, and product choice would be limited.

The balance of this section of these comments expands on the third issue outlined above, related to the lead-time and cadence needed to introduce the types of new technologies contemplated by the ARB rule. DaimlerChrysler strives to be a leader in the effort to introduce new automotive products into the U.S. market as rapidly as possible, and for that reason has closely examined the issues of lead-time and cadence raised by ARB's rule.

At the outset, it must be understood that technologies cannot be incorporated in every vehicle at the same time, due to capital costs, differing vehicle and powertrain planning cycles, and engineering resource constraints both at the manufacturer and supplier level. The incorporation of production intent technologies is dependent on the business case, consumer acceptance, and cost effectiveness. The pull ahead of technologies is not always an option for manufacturers to meet the ARB standards.

Some supporters of the California rule have assumed that manufacturers can simply add new "on-the-shelf" technologies, not currently in their product plans and independent of normal product cadence, in order to comply with the greenhouse gas rule. The Environmental Quality Board should carefully examine that assumption. When technology is said to be "on-the-shelf," it is available to be considered for integration into complete control systems. It cannot simply be "bolted on" to an existing vehicle, as supporters of the California rule have suggested. Integrating any technology into the whole-vehicle package is a complex task that must take into account what a manufacturer is going to build and when and how it is going to build it. New fuel efficiency enhancing technologies, such as continuously variable transmissions and multiple displacement systems, must be far along in their own development process before they can be selected for integration into a new vehicle program.

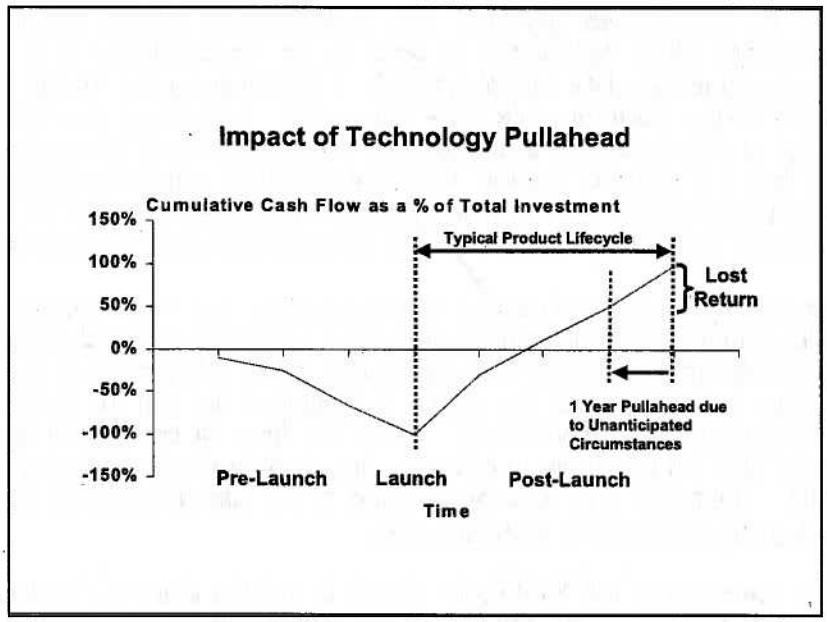
Even after a vehicle prototype is created using a new technology, much work remains to fully develop it. Eventually vehicles with new technology must be built on a highly automated assembly line. These vehicles must also provide consumers with many years and many, many miles of worry-free motoring. So manufacturers must make sure that the design is optimized not just for assembly but also for serviceability and consumer satisfaction in-use. Once this level of confidence is achieved in the design, manufacturers give the go-ahead to build the long lead-time manufacturing tools to keep the product on schedule. Suppliers may also have some of the same lead-time constraints for the components they are going to provide to manufacturers.

Testing of the actual hardware of the "prototype" design is needed and may involve iteration of the production design as a clearer understanding of the interaction of the various sub-systems is developed. A second prototype phase may be needed to prove-out the final production designs. It is with this "production intent" vehicle that manufacturers can begin the durability and certification testing needed to obtain all of the required regulatory approvals. Some technologies will require plant modifications at a manufacturer's assembly plants and those of its suppliers. All of a manufacturer's employees involved must also be trained on the tools and processes required by new technologies. Only then can a manufacturer finally get to the task of building vehicles. This is a multi-year process and a manufacturer cannot revise a product plan late into its implementation.

The processes mentioned above are only part of the cycle, however. Manufacturers must continuously evaluate their processes and consumer acceptance of their products. Manufacturers must make process improvements and resolve any problems that are found. Vehicles are evaluated over the next several years to assure that they continue to meet requirements and consumer expectations.

As manufacturers enhance existing technologies and add new technologies to powertrains in order to improve fuel efficiency, care must be taken not to rush technology into production. Doing so risks consumer rejection and creation of a negative reputation that will be difficult to overcome, even as the technology matures and improves. Premature retirement of existing technologies or applying new technologies too soon disrupts this process and can result in poor performance and ultimately consumer rejection of promising new technologies that could have provided great benefit if allowed the necessary time to mature.

In addition to the potential of destroying market acceptance of new technologies, disruption of the normal product development cycle has severe financial consequences for vehicle manufacturers. As the generic graph below shows, the capital-intensive nature of the auto industry requires stability in product planning and avoidance of premature retirement of technologies and investment in order to maintain economic viability. The pull ahead of a new product/technology that results in retiring a current one by even one year leads to lost returns on the current technology. The graph depicts a situation in which the manufacturer is still able to realize a positive return despite the pull ahead, but it is also possible that the pull ahead action can be the difference between a positive return and a loss.



DaimlerChrysler is continually working to reduce the time from product conception to vehicle launch in order to respond to rapid market changes and improve shareholder return. New engines and transmissions are long-life assets so key consumer attributes such as product quality and system durability cannot be compromised. Engineering and manpower resource constraints dictate that new technologies be introduced into a single product for system integration and refinement before being used on other products. The time to incorporate these technologies into a complete product ranges from several months to several years depending on complexity. Programs like the California

regulation that disrupt normal and competitive market cadences impede the effort to bring new products to market in a manner that allows the industry to use its resources efficiently, and thus to best serve our customers. The Environmental Quality Board needs to undertake an independent assessment of how the California rule will affect product offerings and costs in Pennsylvania.

II. Consumer Impacts

One major assumption in ARB's analysis is that the California greenhouse gas regulations will maximize the interests of the typical new-car purchaser. It is important for the Environmental Quality Board to consider the prior work in this area by the National Highway Traffic Safety Administration ("NHTSA") and other federal government experts, who have decades of experience with the regulation of motor vehicle fuel economy. NHTSA and other federal agencies have expressed skepticism about the utility of consumer benefit estimates that assume that consumers would choose to pay more. This is important in the Environmental Quality Board's analysis, because ARB's focus on the analysis of direct engineering costs of its proposed technologies fails to take into account real-world tradeoffs between fuel economy and other applications of advances in fuel efficiency technology.

As NHTSA has recognized, an agency's "cost and/or benefit estimates [could be] incomplete" if they are based entirely on the costs of a given fuel economy technology and some generalized notion of how consumers might value the fuel consumption savings that a given technology package might produce. As NHTSA has stated:

> "[I]t could be that greater fuel efficiency comes with tradeoffs in power, safety, and design not accounted for in [our] estimated costs, that the engineering costs of implementing new technologies are actually greater than those estimated, or that the actual fuel savings are less than those estimated."

67 Fed. Reg. at 77023, (Monday, December 16, 2002.) A study by the Congressional Budget Office ("CBO") concludes that auto buyers are well-informed about fuel economy and that manufacturers effectively respond to their preferences for fuel economy. The CBO notes that some proponents of increased fuel economy standards argue:

> "...that automakers have low-cost ways to improve fuel economy, that the gasoline savings from those technologies would make consumers better off, and that without increases in CAFE standards, producers would fail to make use of those technologies. Their argument rests on the assumption either that consumers lack information about vehicles' fuel efficiency (*in other words, they do not know what is best for them*) or that producers lack an incentive to respond to consumers' preferences for fuel efficiency." (Italics not in original)

The CBO concluded:

> "Most economists do not believe that either assumption is valid. Vehicles' current level of fuel efficiency most likely reflects consumers' trade-offs between fuel economy and other characteristics that drivers want, such as vehicle mass, horsepower, and safety. The same technologies that can be used to boost fuel economy can be used to hold fuel economy constant while increasing the vehicles' weight, mass, or power. Thus, the fact that producers have done the latter rather than the former in recent years suggests that they have responded to buyers' preferences by targeting available technologies toward other features that

consumers desire. Raising CAFE standards would impose costs on both consumers and automobile producers by forcing improvements in fuel economy that car buyers may not want."

Congressional Budget Office, Reducing Gasoline Consumption: Three Policy Options (November 2002), Chapter 2, page 10. The Environmental Quality Board needs to decide for itself whether typical consumers would be willing to purchase more "fuel-efficient" vehicles so long as the present value of the additional energy savings exceeds the hardware costs. Experience and basic economics show that this is not how rational consumers behave. Improvements in fuel efficiency technology represent either the ability to reduce the amount of fuel required to move a given amount of mass (or achieve a given level of performance) or the ability to move more mass (or increase performance) for a given quantity of fuel consumed.

Consumers normally prefer to use fuel-efficiency technology on any number of attributes in addition to fuel economy, and the value of each of those other applications can also exceed the cost of the associated hardware in terms of the direct engineering costs and benefits. The question is not whether the value exceeds the cost for any one application such as increased fuel economy, but rather, of all the applications, which gives consumers their highest value for the money – i.e., which is cost-effective in an economic sense? Economists call this concept the "equal marginal principle" and it is a fundamental principle underlying their analysis of consumer and producer behavior. As two analysts, MIT Professor Robert Pindyck and University of California Professor Daniel Rubinfeld, have stated:

> "Only when the consumer has satisfied the **equal marginal principle** – i.e., *has equalized the marginal utility per dollar or expenditure across all goods* – will she have maximized utility."

Robert S. Pindyck and Daniel L. Rubinfeld, Microeconomics, (2001), p. 91 (Boldface and italics in original). Consider, for example, a new fuel efficiency technology such as variable valve timing -- one of the technologies evaluated by ARB -- which can be tuned either for fuel economy, or performance, or some combination of the two. Assume that the technology would yield fuel savings more valuable than the direct, engineering costs. Any attempt to force consumers to realize the value of this technology in the form of fuel economy alone would deny them the opportunity to spend the technology on improved performance, or to spend it on a still larger and heavier vehicle that achieved no net reduction in fuel consumption. Forcing consumers to take any or all of the new technology in the form of fuel economy would impose real opportunity costs – costs that the ARB methodology ignores. In that case, ARB's engineering model finds that applying variable valve technology to yield fuel economy improvements is "cost-effective" even though the full "opportunity" or economic costs of that application would exceed the value of the fuel savings.

According to data from the U.S. EPA, over the past 15 years, light truck manufacturers have offered America's vehicle purchasers fuel efficiency improvements of 14% (0.9% per year). Yet, in spite of a full range of vehicle choice from large to small, these consumers have taken all of those improvements in the form of increased performance, mass, and safety and none of those improvements in the form of increased fuel economy. Nevertheless, ARB's rule increases the standard, imposing still more costs on vehicle consumers, already constrained by the existing standard. It is imperative for the Environmental Quality Board to consider the substantial opportunity costs associated with the California regulation.

The command-and-control type of regulation adopted in California and under consideration by the Environmental Quality Board stands in sharp contrast to the consumer- and market-oriented approach recently developed in Canada. Unlike the California rule, the Canadian agreement does not specify limits on any one manufacturer's allowed emissions of carbon dioxide. Rather, the Canadian

automotive industry has agreed to aggregate reductions in greenhouse gases, and those reductions need not be obtained exclusively through reducing the emissions of new vehicles (which are only 8 percent of the total vehicle fleet in Canada).

Further, the Canadian agreement accommodates DaimlerChrysler's integrated North American market strategy. The U.S. Congress recognized the flexibility inherent in national, average standards when it adopted the Corporate Average Fuel Economy (CAFE) program and the Canadian agreement has sufficient flexibility for DaimlerChrysler to incorporate measures in Canada as part of a broad North American strategy. Individual state standards—particularly standards as stringent as California's—permit no such flexibility. ARB's rule creates mandates based on assumptions about how specific technologies would affect fuel economy and that cannot change based on consumer preference. The Canadian agreement, by contrast, recognizes that the success of any technology depends on consumer acceptance, its suitability to any given manufacturer's product portfolio, and the highly competitive nature of each individual company's product strategy, and (unlike the California rule) does not make unreasonable demands on the level and pace at which the industry can introduce new technologies. Officials from the State of California briefed Canadian government members on the California program and the Canadian government ultimately decided to not adopt the California program.

III. Impact of the California Rule on Employment in the Automobile Industry

In developing their regulation, the Air Resources Board staff noted the greenhouse gas regulation will result in decreased vehicle demand over the long term (Addendum to Initial Statement of Reasons, September 10, 2004, Table 12.1-7, pg. 34). To remain competitive, DaimlerChrysler has to maintain production facilities in-line with demand. A long term decrease in demand inevitably results in reduced production and impacts employment. The automobile industry is a significant employer in Pennsylvania. DaimlerChrysler alone has 996 employees, 267 dealers and 437 suppliers in Pennsylvania. An attached analysis of the employment impacts of the California motor vehicle greenhouse gas rule nationwide, prepared by the internationally recognized firm Harbour Consulting, Inc. in 2005, provided a range of estimates of how the California regulation is likely to affect nationwide employment in the automobile industry. Harbour concluded the regulation, when fully implemented, would cause a net loss of over 55,000 U.S. jobs and affects manufacturers in "disproportionate degrees." DaimlerChrysler is disparately penalized because of its model mix. Supporters of the California rule in Pennsylvania appear to assume that Pennsylvania dealers will be able to continue to sell the number of vehicles to Pennsylvania residents and to residents of other states regardless of whether the ARB rules apply in Pennsylvania. Such an assumption is unrealistic. As noted in the comments from the Alliance and from Sierra Research, the higher prices required for California-compliant vehicles will reduce demand for new vehicles within Pennsylvania. ARB has conceded this point for the California new-vehicle market; the only issue is how much vehicle sales in the regulated areas will decline.

Few if any consumers who are not required to purchase a California vehicle will choose to pay the price premium for a vehicle that meets the California standards. To the extent that residents of other states near Pennsylvania are not subject to the California rule, Pennsylvania dealers can expect to lose all or nearly all so-called "cross-border sales" once the California rule comes into effect. Those out-of-state consumers who want vehicles with higher fuel economy will be able to purchase them from dealers located outside Pennsylvania, who currently and in the future will have an ample supply of higher-mileage vehicles for sale.

Conclusion

The California greenhouse gas rule would not serve the best interests of Pennsylvania consumers or the Pennsylvania economy. The analysis offered to support the rule is deeply flawed and needs the Environmental Quality Board's independent review. DaimlerChrysler does not support adoption of the California rule in Pennsylvania, and urges the Environmental Quality Board to carefully consider all the relevant issues before it decides whether to remain in the California program or to rely on the federal motor vehicle fuel economy and emissions rules.