ENERGY SOLUTIONS

March 8, 2013

Chairwoman Mary Nichols
California Air Resources Board
Sacramento, California

Subject: Cap-and-Trade Auction Proceeds Investment Plan – Passenger Vehicle Aftermarket Products Incentive Program

Dear Chairwoman Nichols:

Thank you for the opportunity to comment on the Cap and Trade Auction Proceeds Investment Plan.

California has long been a leader in building demand side management (DSM) incentive programs that drive market transformation. A passenger vehicle aftermarket products incentive program (DSM for Drivers) would extend that experience to cost-effectively overcome market barriers limiting adoption of efficient replacement products such as tires and engine oil.

The DSM for Drivers program would help achieve both the AB32 GHG reduction target and the requirement to "Maximize additional environmental and economic benefits" from cap and trade (section 38570(b)(3)). A fully implemented program can achieve two million metric tons of GHG emissions annually – more than that half of the AB32 Scoping Plan target for in-use passenger vehicle efficiency measures – while saving consumers $750 million annually. This program would be particularly well-suited to low-income communities – meeting the intent of SB535.

To prove this concept, regional pilots can be funded during Cap and Trade Phase I (2012-2014) using Auction proceeds and other funding sources to refine the program design and delivery. We believe that a Phase I budget of $10 million would successfully launch a pilot DSM for Drivers program. During Phase II and III (2015-2020) the DSM for Drivers program can be implemented Statewide to achieve the benefits we have described.

Please see our attached comments for additional information and feel free to contact me at epike@energy-solution.com or (510) 482-4420 x239 if you have any questions.

Sincerely,

Ed Pike, P.E.
Senior Project Manager

DSM for Drivers Program Rationale

California has saved $65 billion over three decades through demand side management (DSM) incentive programs and created a national and international model for cost-effective DSM programs as noted in AB32.[1] DSM programs have been proven to accelerate market transformation for products such as consumer electronics, lighting, and appliances. This experience can be leveraged to achieve similar benefits for passenger vehicle aftermarket products.

For example, in 2009 six utilities and one third-party administrator from California, Nevada and the Pacific Northwest launched a program to mitigate rapid increases in television (TV) plug load energy consumption called the Business and Consumer Electronics (BCE) program. The program incentivized television retailers such as Best Buy, Costco and Walmart to stock, promote and sell the most efficient units on the market. Since the program's inception in 2009 TV energy intensity (measured in watts per square inch) has decreased by 67%, achieving significant consumer cost savings.[2] The program has engaged retailers to train employees and educate customers on the benefits of choosing energy efficient products and has been a key driver in reducing TV energy consumption across the entire US TV market.

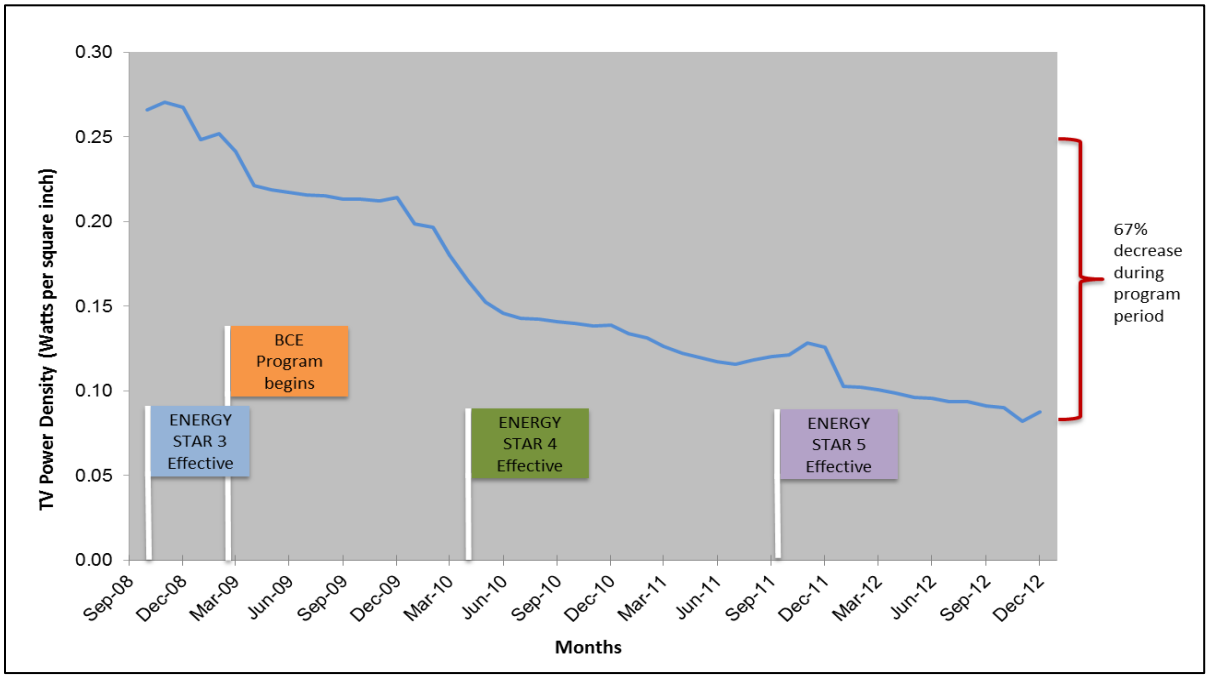

Figure 1: Changes in TV Energy Intensity from 2008-12

Source: Program Analysis Data developed on behalf of Northwest Energy Efficiency Alliance (NEEA).

1 Brown Jr., Edmund G. State of the State Address Remarks as Prepared January 24, 2013.
2 This value is normalized to account for changes in TV screen size over the program time period. While naturally occurring efficiency improvements are also a factor contributing to this improvement, program evaluation interviews with major retailers and US EPA indicate that this program significantly affected retailer decision making as well as ENERGY STAR specification development.

California has a golden opportunity to leverage this experience and overcome market barriers to more efficient passenger vehicle aftermarket products such as tires and engine oil. These market barriers include upfront cost, retailer stocking practices and lack of consumer information. Implementing a DSM for Drivers program is an excellent opportunity to overcome those barriers and accelerate adoption of efficient passenger vehicle aftermarket products.

Program Benefits

- **Achieving AB32 Scoping Plan GHG reduction goal:** The AB32 Scoping Plan calls for 3.6 million metric tons per year (mmtpy) GHG reductions from improving the efficiency of the in-use passenger vehicle fleet (including 0.55 mmtpy from a tire tread program that has already been adopted) – the fourth largest transportation sector category of GHG emission reductions in the AB32 Scoping Plan.[3] The DSM for Drivers program would complement standards for fuels and new vehicles and smart growth planning by targeting in-use passenger vehicle GHG emissions.

  We estimate that DSM for drivers can achieve in-state GHG reductions of about two mmtpy, or two-thirds of the remaining AB32 target for in-use passenger vehicles. We estimate that a 50% adoption rate of low-rolling resistance tire technology (rolling resistance represents the amount of frictional force generated given a certain weight on the tires) compared to the replacement market average shown in Figure 2 would achieve 1.8-2.4 mmtpy of avoided GHGs. We estimate that low friction engine oil would achieve GHG reductions of 0.2 mmtpy at a modest deployment rate of 20% assuming a 1% efficiency gain (with the potential for greater reductions at higher deployment rates).[4]

  In addition to climate benefits the program would achieve significant local air quality benefits. These benefits occur both from lower tailpipe emissions, as well as reduced upstream petroleum refining emissions.[5]

3 See AB32 Scoping Plan Appendix C p-64.

[4] These calculations are based on a 119 mmtpy baseline, including adjustment for reductions such as Pavley regulations; a 20% reduction in rolling resistance to 0.008 dimensionless rolling resistance co-efficient (or 8 lbs rolling resistance force per 1000 lbs vehicle weight) compared to industry average shown in Figure 2; and a conservative estimate of 15%-20% contribution of rolling resistance to overall net passenger vehicle energy consumption for rolling resistance. We note that CARB estimated 2% improvement in vehicle energy efficiency due to low friction engine oil in AB32 Scoping Plan Appendix C p. C-63; while US EPA's RIA EPA-420-R-10-009 estimated 0.5% improvement (at cost of only $3 vehicle p1-6).

[5] Petroleum production emissions would also potentially decrease, to the extent that California production is sensitive to in-state demand.

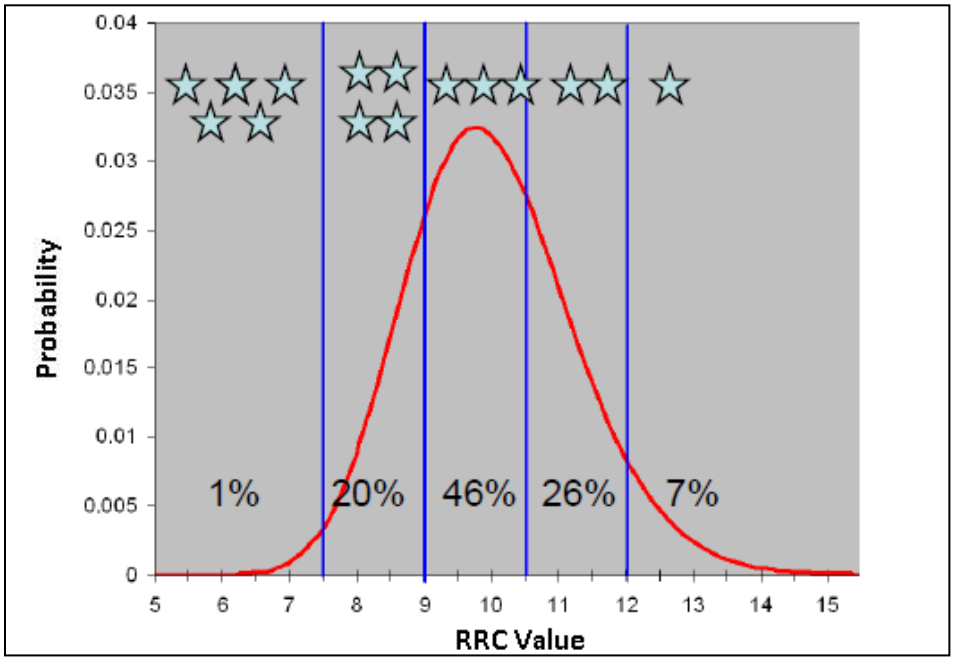

Figure 2: Fitted Sales-Weighted RRC Distribution Curve

Source: Rubber Manufacturers Association, 2009.[6]

- **Achieving AB32 Scoping Plan $750 million annual consumer savings target:** We estimate that a DSM for Drivers program would achieve CARB's estimated annual cost savings of $750 million for in-use passenger vehicle efficiency measures in the AB32 Scoping Plan.[7] We estimate a cumulative net benefit of greater than $5 billion as shown in Figure 3, which would go a long way to achieving the goal of "maximizing additional environmental and economic benefits for California."[8] These savings opportunities provide consumers an opportunity to engage in the state's AB32 goals while also helping to mitigate any cap and trade fuel price increases that producers and suppliers pass-through to consumers.

[6] Michelin North America. (2009, June). *Rubber Manufacturers Association Presentation* [PowerPoint Slides]. Retrieved from: http://www.energy.ca.gov/transportation/tire_efficiency/documents/2009-06-10_workshop/presentations/2009-06-10_WISCHUSSEN_RMA.PDF.

[7] See Appendix C p-64; note that the scoping plan includes a regulatory approach.

[8] Energy Solutions' calculation is based on 14 billion gallons of fuel per year baseline after adjusting for effect of Pavley new vehicle regulations, $3.76 fuel cost excluding state taxes, and efficiency improvement noted above. We estimate the passenger vehicle replacement tire market at 36-37 million tires annually; with 50% adoption rate and incremental cost estimates ranging up to $10/tire (See Pike, E. 2011. Opportunities to Improve Tire Efficiency.). Specific details such as cost-buy down ratio, free-ridership, and implementation cost can be determined during program planning and initial pilot projects. AB32 citation is section 38570(c).

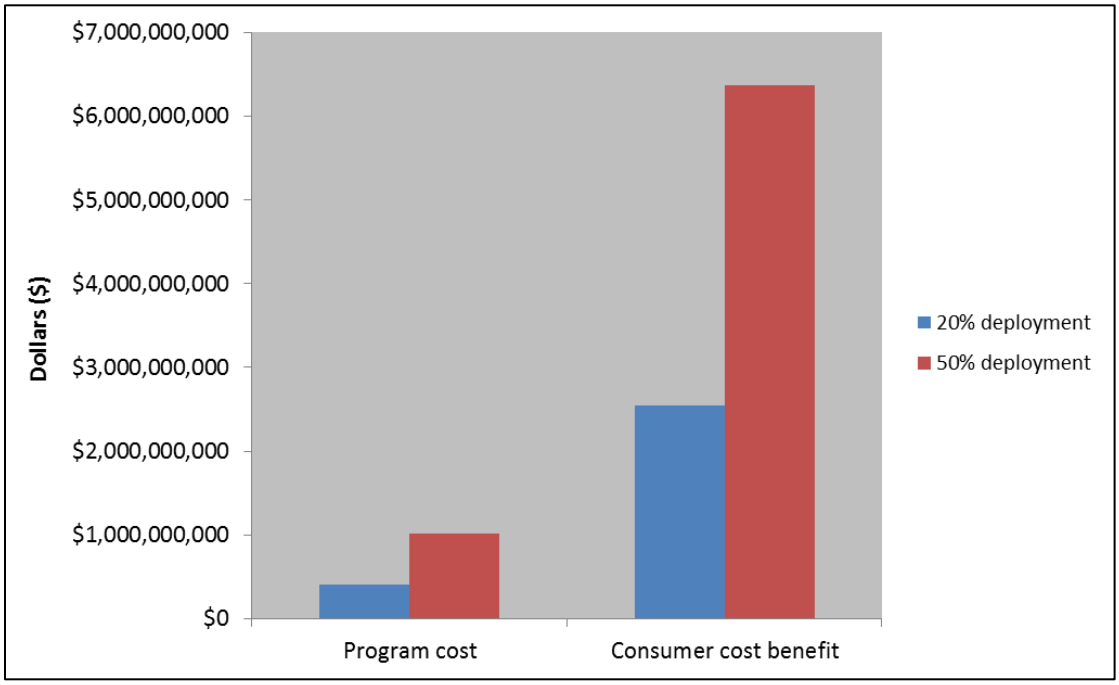

Figure 3: Example Cumulative Tire Efficiency Program Cost and Consumer Cost Benefit

This program will also reduce potential for economic "leakage" by making California's economy less reliant on imported petroleum, and more money will be invested in-state.[9]

- **Engaging disadvantaged communities:** This program will also facilitate SB535 disadvantaged community participation goals as it is inherently well suited to low-income drivers because they are more likely to drive used cars and thus purchase replacement tires. Low-income consumers are also likely to be more sensitive to prices and thus more apt to leverage incentives. The initial Regional pilots mentioned earlier can be designed to make sure that disadvantaged communities are strongly represented from the start; and targeted outreach to disadvantaged communities can encourage their participation throughout the program.
- **Synergies with other government programs:** California enjoys an excellent opportunity to leverage European Union and other tire efficiency incentive programs.[10] Harmonized rating bins have been adopted in the European Union, Japan and South Korea. In addition, these countries and the United States have adopted a harmonized test method, providing potential building blocks for a California program. Incentives can either stand alone, or can complement and potentially catalyze the California regulatory program required by state law and the Federal tire rating program required by section 111 of the Energy Independence and Security Act of 2007. The DSM for Drivers program also ensures that California does not become a dumping ground for tire manufacturers that do not upgrade their facilities to match requirements in other

[9] For information on economic benefits from re-invested consumer savings please see Roland-Holst, D. 2011. Driving California's Economy: How Fuel Economy and Emissions Standards Will Impact Economic Growth and Job Creation.

[10] See Pike, E. 2011. Opportunities to Improve Tire Efficiency.

countries. Finally, the DSM for Drivers program can furthermore serve the role of "encouraging other states, [and] the federal government … to act" as noted in AB32.

Funding

Initial funding in FY 2013/4 at the level of $10 million will support regional pilot programs and provide the opportunity to leverage additional federal, state and local funding sources (especially given lesser amounts of cap and trade GHG allowance auction funding available through the end of 2014 - when embodied transportation fuel GHG emissions will be fully included in auction revenue rather than just a portion in advanced auctions).

Energy Solutions estimates that an annual budget of $200 million from 2015-2020 would achieve the $750 million AB32 consumer savings estimate for low-rolling resistance tires and low friction engine oil.[11] While program cost estimates can be updated after initial pilot project experience, we expect that the benefits of the DSM for Drivers program can be achieved with 10% or less of all transportation-related allowances allocated by the California Air Resources Board during Cap and Trade Phases II and III (2015-2020). By comparison, California's highly successful existing energy efficiency programs received over $1.5 billion in funding in 2012, and serve as a national and international model.[12]

Relationships Between Low-Rolling Resistance and Other Tire Characteristics

Policy-makers will likely have an interest in whether fuel efficiency – as represented by tire rolling resistance - is related to characteristics affecting safety and durability. Energy Solutions analyzed California Energy Commission (CEC) test data for 600 tires and over 120 models to provide initial information.[13]

Several sources find that improved rolling resistance need not sacrifice safety (represented by wet or dry stopping distance).[14] Almost all tires in the CEC data set, both with above average and below average rolling resistance test scores, were rated "A" for traction by manufacturers. An incentive program could include an anti-back sliding minimum value for traction, an element included in the European Union program, to incentivize improvements in both energy efficiency and safety.

Energy Solutions also examined two potential proxies for durability: manufacturer rated treadwear and measured tread depth. We did not find any statistically significant positive or negative correlation between manufacturer's rated tread wear and rolling resistance. We also evaluated tread depth against

[11] This estimate is based on 50% penetration of the DSM for Drivers tire technology program, initial funding of other potential opportunities such a s low friction oil and possibly driver education, and cost factors noted in footnote 8.
[12] IEE. 2013. Summary of Consumer Funded Electric Efficiency Savings, Expenditures, and Budgets (2011-2012). March.
[13] These datasheets are available from the CEC website: http://www.energy.ca.gov/transportation/tire_efficiency/documents/2009-06-10_workshop/presentations/excel_files/.
[14] See discussion in Pike, E. 2011. Opportunities to Improve Tire Efficiency.

rolling resistance as shown in Figure 4A and 4B (in part because manufacturers' rated treadwear values are not independently verified and thus have uncertain accuracy). These plots indicate the possibility of a small correlation between rolling resistance (RR) and reduced tread depth, which could occur because reduced tread depth reduces the amount of material that is subject to internal friction. However, the data indicates that any relationship between reduced tread depth and rolling resistance is very limited - thus other factors such as manufacturing methods and materials are likely the primary drivers for improved rolling resistance.

In both cases, the data indicate that fuel economy goals can be achieved without reducing the traction or durability of passenger vehicle replacement tires.

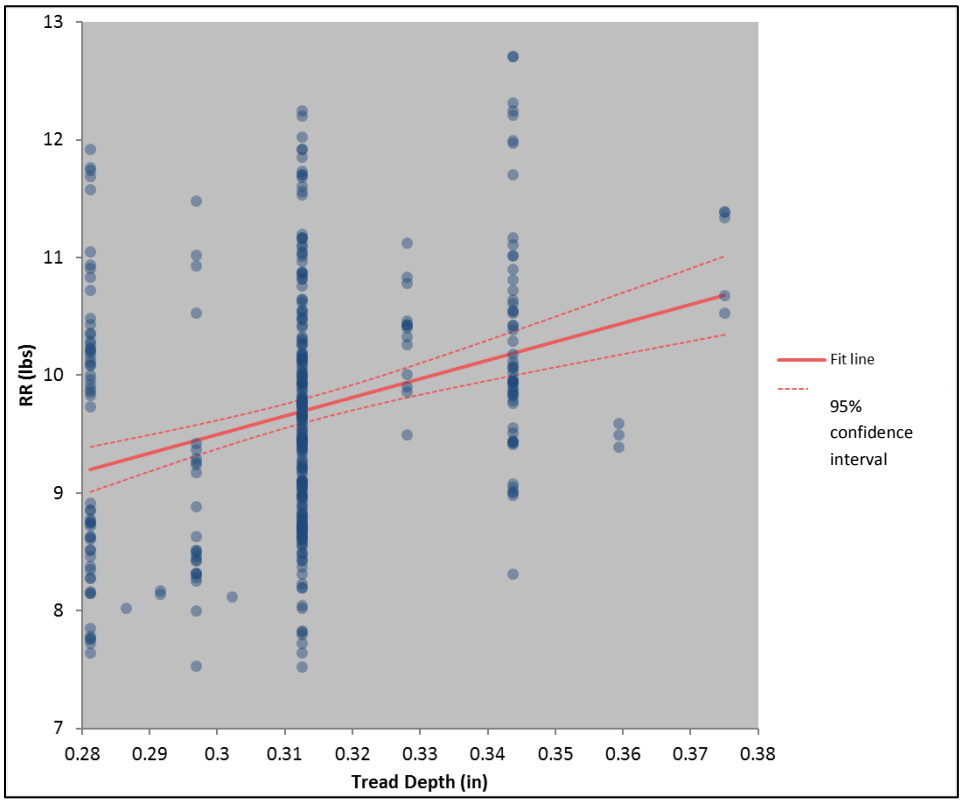

Figure 4A: Tread Depth and Rolling Resistance for P195 tires

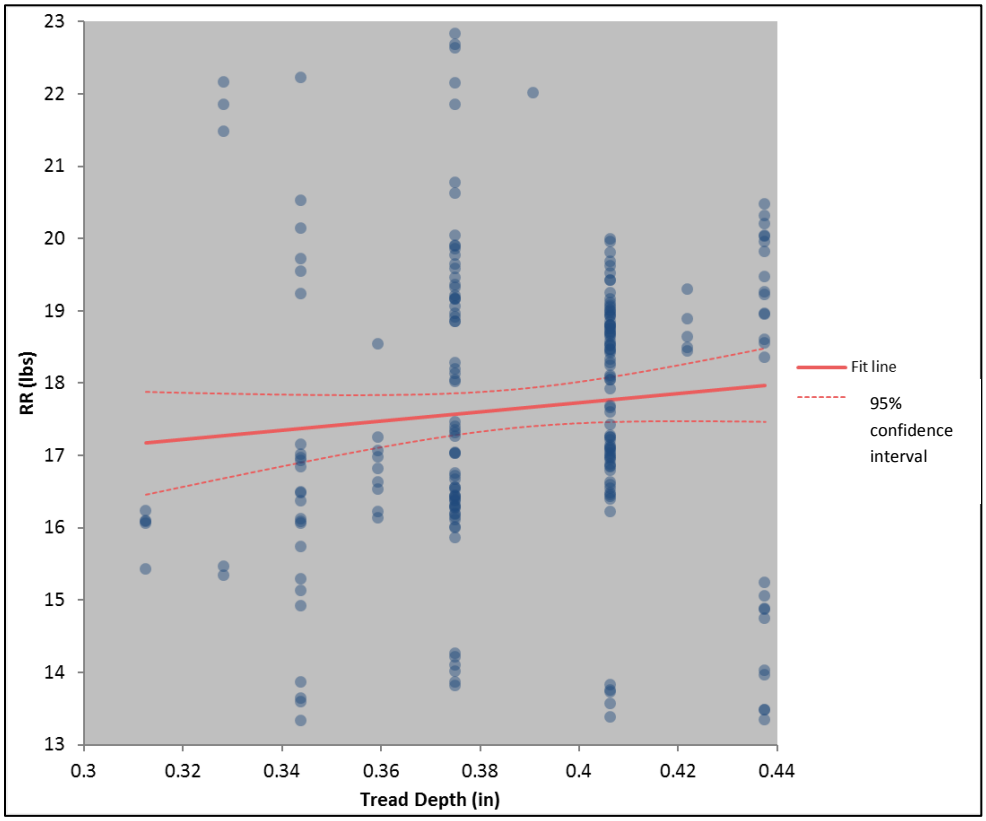

Figure 4B: Tread Depth and Rolling Resistance for P265 tires

Conclusion

California's successful implementation of building DSM, combined with our landmark AB32 legislation and other groundbreaking environmental initiatives, has made California a national and international leader in combatting climate change. DSM for Drivers is an immediate and highly cost-effective opportunity to facilitate the economic, environmental and social goals of AB32. Annual consumer savings of $750 million or greater and two mmtpy of in-state GHG savings will support AB32 goals and provide numerous ancillary benefits. California's impressive history has set the stage to enhance its role as a climate leader through implementation of DSM for Drivers.