

CALIFORNIA STATE FUEL-EFFICIENT TIRE REPORT: VOLUME I

SUMMARY OF FINDINGS AND RECOMMENDATIONS

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Gray Davis, Governor

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Introduction

As required in Senate Bill 1170 (Sher, Chapter 912, Statutes of 2001), the California Energy Commission (Energy Commission) is pleased to submit the *California State Fuel-Efficient Tire Report*. The report is submitted in two volumes:

Volume I: Summary of Findings and Recommendations

Volume II: Consultant Report

Volume I summarizes the major findings and recommendations of the Energy Commission regarding the potential for a state, fuel-efficient tire program. The Energy Commission's consultant, Ecos Consulting, developed and wrote Volume II. The report is due to the Governor and Legislature no later than January 31, 2003.

Vehicle tires, particularly replacement tires, show a wide variation in fuel efficiency based on their composition and design. Because these variations can have a significant impact on vehicle fuel economy, investigating ways to improve the fuel efficiency of tires and making information available to the public is a desirable goal.

SB 1170 requires that the Energy Commission make specific recommendations to:

- Establish a test procedure for measuring tire fuel-efficiency.
- Develop a data base of fuel-efficiency of existing tires in order to establish an accurate baseline of tire efficiency.
- Develop a rating system for tires that provides consumers with information on the fuel-efficiency of individual tire models.
- Implement a consumer-friendly system to disseminate tire fuel-efficiency information as broadly as possible. The Commission shall consider labeling, Web site listing, printed fuel economy guide booklets, and mandatory requirements for tire retailers to provide fuel-efficiency information.
- Study the safety implications, if any, of different policies to promote fuel-efficient replacement tires in the consumer market.
- Mandate a fuel-efficiency standard for all after market tires sold in California.
- Offer a rebate to purchasers of replacement tires that are more fuel-efficient than the average replacement tire.

To respond to this legislative request, the Energy Commission contracted with TIAX, LLC and Ecos Consulting to help define the necessary parameters for a fuel-efficient tire program. The Energy Commission held two workshops in the fall of 2002 to solicit comments from interested parties. The following stakeholders provided input to the report:

- Tire manufacturers,
- Energy Foundation,
- Natural Resources Defense Council,
- Union of Concerned Scientists,

- National Renewable Energy Laboratory,
- California Integrated Waste Management Board,
- California Air Resources Board,
- Department of Toxic Substances Control
- Other state agencies.

Volume II examines the available information on the use of low-rolling resistance (a measure of tire fuel efficiency) replacement tires and the potential fuel savings. Volume II also discusses factors such as cost, wear, safety and other characteristics of low-rolling resistance tires, and includes comments from our workshops.

Findings

Based on the data and analysis contained in Volume II, the Energy Commission makes the following findings:

- Potential fuel savings from fuel-efficient tires is substantial
- Sufficient data is not available to draw conclusions regarding the performance and characteristics of fuel-efficient tires
- Collecting relevant data could cost between \$150,000 and \$700,000
- A preferred test procedure for measuring tire rolling resistance is available
- Lack of consumer information hinders widespread use of fuel-efficient tires

The findings are discussed in detail below.

Fuels Savings Potential. Based on preliminary data and modeling, Ecos Consulting found that low rolling resistance tires could improve the fuel economy of a passenger vehicle by approximately three percent. They estimate that, in theory, California could save approximately 300 million gallons of gasoline annually by using low-rolling resistant tires. More realistically, a campaign to encourage low-rolling resistant tires, assuming a 25 to 35 percent penetration, could reduce gasoline consumption in the state by 77 to 107 million gallons annually. As a result, California consumers could save approximately \$118 million to \$165 million annually.

Significant amounts of diesel fuel could be saved if the program were expanded to include low-rolling resistant tires on heavy-duty vehicles. Because many heavy-duty vehicles carry substantial loads, the impact of rolling resistance on fuel economy is even greater than with passenger vehicles.

Additionally, savings could also be realized if a fuel-efficient tire program includes educating and encouraging the public to maintain proper tire inflation. The Energy Commission calculates that Californians could save 10 million gallons of gasoline or more annually by reducing the widespread problem of underinflated tires.

Lack of Relevant Data. Although widespread use of low-rolling resistance tires could result in significant fuel savings, the tire data from this project were insufficient to show conclusively what impact, if any, more fuel-efficient tires have on safety and other characteristics. Therefore, critical tire data must first be obtained, either from the tire manufacturers or by the state developing its own testing program, before the Energy Commission can develop plans for a comprehensive fuel-efficient tire program.

The Energy Commission and its contractors made repeated requests to the tire industry for detailed data on rolling resistance. However, the tire manufacturers, through the Rubber Manufacturers Association, responded that the data on rolling resistance would not be meaningful to this project.

Ecos Consulting, in a related project funded by the Energy Foundation, obtained 43 new tires and tested them for rolling resistance at an independent laboratory. Ecos Consulting compared the rolling resistance of these tires and various other tire characteristics, such as tread wear, traction, and cost. These tests did not show statistically high correlations between rolling resistance and these other characteristics. Because of the limited tire data, clear conclusions cannot be made with confidence.

Approaches to Data Collection. Substantially more tire data is needed before an efficient tire program can be developed showing potential impacts fuel efficient tires would have on safety, tread wear, etc. Ideally, tire data should be collected and compiled from tire manufacturers. Because the Energy Commission lacks the expertise to interpret highly technical tire data, an expert contractor would be necessary to analyze and evaluate the data, costing approximately \$150,000.

Estimated Cost for Tire Expert

Test Data from Tire Makers	Activity	Hour and Rate	Cost
Expert contractor	Analyze and evaluate tire data received from manufacturers	1500 hours @ \$100/hour	\$150,000

Alternatively, the state could undertake a testing program to generate the critical data, with the minimum cost over a two-year period estimated at \$700,000. This figure would include testing 1400 tires (two years at 700 tires per year), employing an expert contractor, and other related costs.

Estimated Cost for State Tire Testing Effort

Test Data Collected By State	Activity	Hour and Rate	Cost
Test 700 tires/year for 2 years	\$300/test @ 1400 tests SAE J2452	-	\$420,000
Testing related costs	Various supplies, equipment and travel	-	\$30,000
Expert contractor	Oversee testing process, analyze and evaluate test results	2500 hours @ \$100/hour	\$250,000
Total Cost	-	-	\$700,000

Preferred Test Procedure. An integral component of data collection is establishing an appropriate test protocol. Two test procedures are available: the Society of Automotive Engineers (SAE) J2452 and SAE J1269. Ecos Consulting has concluded that the SAE J2452 test procedure is superior for measuring rolling resistance because it requires testing tires under different speeds and loads. By contrast, the traditional rolling-resistance test method used, SAE J1269, performs the test at constant speed and load, which is less representative of real-world driving conditions.

Lack of Consumer Information. Currently, consumers lack any meaningful information to distinguish fuel efficiency differences among various types of tires. Tire labeling now includes information on the manufacturers name, tire class, maximum cold inflation pressure, tire width, etc., but not information on rolling resistance which indicates tire efficiency. Furthermore, information on rolling resistance is unavailable from retail tire sites or other sources. As a result, most consumers are completely unaware of how the tires they buy affect their vehicles' fuel economy.

Several industry representatives indicated that customers have not shown any preferences for lower-rolling-resistance tires, and only the automobile manufacturers require specifications on tire rolling resistance. However, it is not clear whether consumers do not request information because they are uninterested or simply do not know enough about the issue to ask. The Energy Commission believes that if consumer-friendly information were available on tire rolling resistance, many consumers would be interested and could make informed decisions about which tires to purchase.

Ecos Consulting analyzed various labeling systems that could give consumers information about the fuel-efficiency of various tires which is contained in Volume II.

The Rubber Manufacturers Association maintains that proper tire pressure improves tire safety, tread wear, and rolling resistance. As Ecos Consulting suggests, a program designed to encourage consumers to maintain recommended tire pressure would not detract from a complementary program to promote lower-rolling-resistance tires. Tire-maintenance programs, such as the Rubber Manufacturers Association's campaign: "be tire smart, play your PART," (which stands for Pressure, Alignment, Rotation and Tread) could be implemented quickly and would not require consumers to purchase new tires.

Recommendations

Based on the findings above, the Energy Commission makes the following recommendations:

- Expand Data Collection
- Develop a Tire Efficiency Information Program
- Develop and Disseminate Consumer Information on Tires

These recommendations are below.

Expand Data Collection. Because it lacks sufficient data on tire attributes, the Energy Commission cannot recommend the best approach for developing an effective fuel-efficient program. A comprehensive data collection and testing program is needed before the Energy Commission can recommend a program. The Energy Commission should be authorized to collect data from at least 700 tires per year. The data from these tests would provide enough information on the variations of rolling resistance among tires and to determine what effect, if any, low rolling resistance tires have on other characteristics.

The Energy Commission will request that the tire industry voluntarily provide additional, relevant tire data, as it appears that the Energy Commission has the statutory authority to require these data. These data should include information on all light-duty vehicle tires offered for sale in California, measured according to SAE J2452. The state could require manufacturers to test their tires at an independent laboratory competitively selected by the state, unless manufacturers recommend an acceptable alternative approach to test their tires and appropriately calibrate their test equipment to ensure comparable results. A formal challenge process could be set up to resolve disputes.

The Energy Commission recommends that SAE J2452 test procedure, the preferred method of obtaining data on rolling resistance, be utilized for compiling relevant tire data. This test procedure, while still not used universally, best reflects real-world driving conditions. Because none of the known independent tire testing laboratories are currently equipped to conduct SAE J2452, the Energy Commission and the tire manufacturers should work together to obtain these data and solicit other agencies and foundations to help offset the costs. In addition to collecting data on tire rolling resistance, analysis and potentially additional testing are needed to ensure that no significant safety or other important tire attributes are compromised with fuel-efficient tires.

Develop a Tire Efficiency Information Program. If widespread, a California program to use more fuel-efficient tires could provide significant fuel saving, with its accompanying benefits. Therefore, the Energy Commission recommends that the state develop a program to educate consumers about the fuel efficiency attributes of tires. This program is one option in a larger strategy to reduce petroleum consumption in California. Indeed, tires are one of the very few options available for consumers with the potential to improve the fuel efficiency of their existing vehicles.

The Energy Commission should evaluate the effectiveness of various consumer energy-labeling programs and how they could best be applied to tires. However, the lack of sufficient data makes it impossible for the Energy Commission to recommend a specific tire education program at this time, as such a program would need to consider the tradeoffs between rolling resistance, safety and other key tire characteristics.

A campaign to promote proper tire inflation and maintenance could complement a broader program to promote tire efficiency and could begin immediately. The Energy Commission agrees that proper tire inflation is fundamentally important for efficiency,

prolonged tire life, and enhanced safety. We welcome the tire industry's proposal to begin this campaign in California and expect to cooperate in this effort.

The Energy Commission has not identified a funding source for this campaign, with the Waste Tire Management Fund the only source of known funding. The California Integrated Waste Management Board manages this fund and collects approximately \$28 to \$32 million annually (\$1 per tire) through this fund for the purpose of waste-tire reduction.

Develop and Disseminate Consumer Information on Tires. To understand consumer preferences about tires more completely, the Energy Commission should conduct focus groups. Understanding the trade-offs of factors that affect consumer buying decisions – from energy efficiency, to durability, to how a tire is marketed – will help in developing an effective tire program. As with other recommendations, the data from tire testing will contribute to any future program aimed at helping consumers compare tire efficiency with other important factors when purchasing tires.

The Energy Commission can also implement a program to support research and develop efforts to improve tire fuel-efficiency and minimize the potential trade-offs discussed above. The Energy Commission has extensive experience conducting energy R&D programs and could extend this work into tires, if it is determined that industry is not adequately supporting fuel-efficiency advancements.

Finally, the Energy Commission should work closely with other state agencies, such as the Integrated Waste Management Board, to consider methods to extend the tire life, as these methods may affect rolling resistance in tires and related matters. The California Department of General Services also should be included in any tire program, so that appropriate rolling resistance criteria can be designed to assist them in their procurement of tires for the state fleet.