

DEPARTMENT OF FINANCE BILL ANALYSIS

AMENDMENT DATE: RN 11 23650
POSITION: Oppose

BILL NUMBER: AB 306
AUTHOR: M. Gatto

BILL SUMMARY: Energy: Piezoelectric Transducers: Study

Existing law requires the California Energy Commission (CEC) to increase total renewable electricity production statewide. Existing law establishes the Renewable Resources Trust Fund (RRTF) within the CEC to fund programs to develop new in-state renewable electricity generation technology facilities.

This bill would require the CEC to conduct research on generating electricity using piezoelectric transducers under roadways or railways. If the CEC determines such technology could generate electricity with performance, reliability, and cost projections comparable to existing or emerging renewable energy sources, the bill would require the CEC to establish piezoelectric pilot projects, and to collaborate with the Department of Transportation (Caltrans) if the pilot programs are conducted in a facility that is part of the state highway or rail system under Caltrans jurisdiction. The bill would authorize the CEC to expend RRTF, upon appropriation, for research and require the CEC to report its findings in the integrated energy policy report to be adopted in 2013. The bill provisions would be repealed effective January 1, 2015.

FISCAL SUMMARY

The CEC estimates the combined costs of the independent analysis and laboratory studies of piezoelectric technology at \$300,000 to \$500,000 RRTF in contract costs. The CEC estimates a need for an additional \$2 million to \$4 million RRTF for a pilot project or projects, should initial research merit such a project or projects.

Caltrans does not have an estimate of the costs to conduct the research on the specified technology "according to its usual research protocol." However, Caltrans estimates, a pilot project deemed necessary based upon the CEC research, could cost \$1.4 million over an 18-month period. These costs would be for a contract for a test section of pavement utilizing the technology, and to simulate 30 years of pavement use to determine energy generation potential, and required maintenance costs. The bill is silent on whether Caltrans costs would be eligible for RRTF funding. Any resource needs for CEC and Caltrans would be evaluated during the annual budget development process. The bill does not contain an appropriation.

COMMENTS

The bill is intended to ensure the CEC conducts research on piezoelectric energy-harvesting technology, to allow roadway use to offset vehicle emissions by producing clean electricity from the transportation system.

The Department of Finance is opposed to the bill for the following reasons:

- The bill conditions pilot project implementation on CEC making a determination such technology could generate electricity with performance, reliability, and costs comparable to existing or emerging renewable energy sources. However, the CEC research will not account for potentially significant roadway deterioration and increased maintenance costs prior to completion of a full-scale roadway test section at a significant additional cost.

(Continued)

Analyst/Principal Date Program Budget Manager Date
(0621) J. McGuinn Karen Finn

Department Deputy Director Date

Governor's Office: By: Date: Position Approved
Position Disapproved

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**COMMENTS –Continued**

- The bill, by requiring the CEC to conduct research on a specified technology, would set a precedent to carve out specific technologies for funding preference regardless of whether such projects meet CEC RRTF funding eligibility criteria.
- The bill would impose significant costs upon the CEC and Caltrans, for which no appropriation authority is provided. Moreover, the RRTF is estimated to have only a \$2.23 million fund balance at the end of 2011-12. That balance does not take into account \$8 million per year for an additional four years, committed for Energy Partnership Academies, by Chapter 2, Statutes of the first extraordinary session of 2011 (SBx1 1, Steinberg). Moreover, the Public Goods Charge, a principal revenue source to the RRTF, will sunset December 31, 2011. Any Public Goods Charge extension would need to be legislatively authorized.
- The bill is premature. The CEC has spent about \$400,000 Public Interest Research, Development, and Demonstration Fund on research of piezoelectric technology conducted over the past eight years as part of the Enabling Technology Demonstration program through the University of California Berkeley. The UC Berkeley research team is currently developing piezoelectric technologies for two smart grid applications. The funded piezoelectric technology research results are expected in a final report in the 2012-13 timeframe.

By placing piezoelectric sensors underneath a road, the vibrations produced by vehicles can be converted into electricity, which may have the potential to be used to power roadside lights, call boxes, and neighboring communities. A piezoelectric firm in Israel estimates a kilometer single-lane stretch of roadway can generate up to 44 megawatts of electricity in a year, enough to power 30,800 homes. However, Caltrans notes mathematical calculations by the University of California, Berkeley Institute of Transportation Studies support an estimate each kilometer of energy harvesting devices placed on the busiest highways could only generate 900 watts of electricity, enough to supply power to nine 100-watt light bulbs.

This technology has been placed underneath highways in Israel. However, it does not appear that an independent cost-benefit analysis of the technology has been conducted. Caltrans has expressed significant concern with the potential for compromised roadway longevity and increased maintenance costs related to use of the technology. Caltrans estimates installing the piezoelectric technology would cost \$500,000 per mile and would involve shutting down major freeways, such as those serving the ports and metropolitan areas with high levels of vehicular traffic.

Code/Department Agency or Revenue Type	SO	(Fiscal Impact by Fiscal Year)								Fund Code	
	LA	(Dollars in Thousands)									
	CO	PROP	2011-2012		2012-2013		2013-2014				
	RV	98	FC	FC	FC	FC	FC	FC			
2660/Caltrans	SO	No	----- See Fiscal Summary -----								0382
3360/Energy Comm	SO	No	C	\$500	C	\$2,000 - 4,000		--	0382		
<u>Fund Code</u>	<u>Title</u>										
0382	Renewable Resource Trust Fund										