

State of California
AIR RESOURCES BOARD

RESEARCH PROPOSAL

Resolution 09-30

April 23, 2009

Agenda Item No.: 09-4-2

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code sections 39700 through 39705;

WHEREAS, a research proposal, number 2679-264, entitled "A Field Experiment to Assess the Impact of Information Provision on Household Electricity Consumption," has been submitted by the University of California, Los Angeles;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

Proposal Number 2679-264 entitled "A Field Experiment to Assess the Impact of Information Provision on Household Electricity Consumption," submitted by the University of California, Los Angeles, for a total amount not to exceed \$173,934.

NOW, THEREFORE BE IT RESOLVED that the Air Resources Board, pursuant to the authority granted by Health and Safety Code section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

Proposal Number 2679-264 entitled "A Field Experiment to Assess the Impact of Information Provision on Household Electricity Consumption," submitted by the University of California, Los Angeles, for a total amount not to exceed \$173,934.

BE IT FURTHER RESOLVED that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein, and as described in Attachment A, in an amount not to exceed \$173,934.

I hereby certify that the above is a true and correct copy of Resolution 09-30, as adopted by the Air Resources Board.



Monica Vejar, Clerk of the Board

ATTACHMENT A

“A Field Experiment to Assess the Impact of Information Provision on Household Electricity Consumption”

Background

Meeting near-term (AB 32) and long-term (2050) climate goals will require extensive behavioral changes in home energy and water use. Studies of residential energy consumption indicate that behavioral and demographic factors typically account for as much variability as size, construction features, and efficiency of major home appliances. Nevertheless, behavioral change campaigns and exploitation of demographic determinants to streamline public outreach have been scarce, despite the success of many well-designed and adequately funded initiatives to change behavior in sizeable portions of target populations when behaviors have tangible benefits (including peer approval). Among the reasons for the relative dearth of behavioral change programs in energy management is a lack of information to guide their design and gauge effectiveness: research delineating behavioral and demographic determinants of greenhouse gas emissions has historically been neglected, along with systematic and comprehensive investigation of the limited number of campaigns designed to influence residential energy consumption. The proposed research offers empirical investigation of the effectiveness of and barriers to residential energy conservation interventions. The design of the interventions to be explored makes use of recent and ongoing work regarding behavioral dimensions of energy consumption and evaluation of outreach programs.

Objective

Specific objectives of the proposed research are four-fold. First, the research will characterize determinants of households' baseline electricity consumption, based on consumer survey results and actual consumption data. Secondly, the work will quantify the direct impacts of household-specific information treatments on residential electricity consumption on monthly usage. Investigators will also probe residential consumers regarding attributes that may explain the disparity between observed behavior and “rational actor” models of home energy consumption, e.g., impatience, risk aversion, knowledge (or lack thereof) about tiered electricity pricing. Finally, researchers will clarify the role of peer-to-peer spillover effects and “local learning” on encouraging energy conservation to shed light on whether people who are randomly assigned to the treatment group influence their friends' consumption patterns through communication of information gleaned from the treatment.

Methods

The proposed study involves a blind, controlled field experiment with randomly sampled households receiving various treatments tailored to help them reduce their electricity consumption. The investigators will partner with a California utility, which will facilitate access to information regarding residential consumption and offer a familiar, trusted interface through which to contact residential consumers. Households will be randomly assigned to treatment and control groups, with treatment groups being characterized with respect to socio-demographics, appliance attributes, and energy usage patterns. Treated households will also be offered several interventions (e.g., provision of

information regarding energy conservation) that may help them to reduce energy consumption.

Expected Results

Analyses will gauge whether and to what extent the interventions succeed in reducing residential electricity consumption, which of the three information treatments is most effective, and what, if any, spillover effects occur among peers identified by participants.

Significance to the Board

Study results will help the Air Resources Board (ARB), utilities, and/or other stakeholders design and evaluate programs to reduce residential electricity consumption. Residential energy consumption accounts for a substantial portion (14 percent in 2002-2004) of California's greenhouse gas (GHG) emissions, and the Board's recently-approved Scoping Plan identifies voluntary actions as well as residential energy efficiency as key components of the State's strategy to meet a 2020 GHG emissions goal equal to the 1990 baseline. To meet the 2050 goal of 80 percent reductions in GHG emissions, dramatic shifts in the ways residential consumers of goods, energy, and services choose and use technologies will be necessary. Data collected during the course of this study may offer additional opportunities to research what motivates residential consumption and conservation.

Contractor:

University of California, Los Angeles (UCLA)

Contract Period:

17 months

Principal Investigators (PI):

Matthew E. Kahn (PI) and Frank A. Wolak (co-PI)

Contract Amount:

\$173,934

Basis for Indirect Cost Rate:

The State and the UC system have agreed to a ten percent indirect cost rate.

Past Experience with this Principal Investigator:

Dr. Matthew E. Kahn, a Professor at UCLA's Institute of the Environment, holds secondary appointments in the Department of Economics and the Department of Public Policy. He is professionally distinguished as a Research Associate at the National Bureau of Economic Research and serves on the editorial boards of the *Journal of Urban Economics*, *Regional Science and Urban Economics* and the *Journal of Regional Science*. Dr. Kahn's publications, including his book *Green Cities: Urban Growth and the Environment*, reflect his skill at grappling with economic dimensions of the foremost policy and environmental conundrums of our time.

Prior Research Division Funding to University of California, Los Angeles:

Year	2008	2007	2006
Funding	\$61,959	\$616,171	\$348,990

B U D G E T S U M M A R Y

University of California, Los Angeles

A Field Experiment to Assess the Impact of Information Provision on Household
Electricity Consumption

DIRECT COSTS AND BENEFITS

1.	Labor and Employee Fringe Benefits	\$	34,848
2.	Subcontractors	\$	56,433
3.	Equipment	\$	0
4.	Travel and Subsistence	\$	0
5.	Electronic Data Processing	\$	0
6.	Reproduction/Publication	\$	0
7.	Mail and Phone	\$	0
8.	Supplies	\$	0
9.	Analyses	\$	0
10.	Miscellaneous	\$	<u>71,393¹</u>
Total Direct Costs			\$162,674

INDIRECT COSTS

1.	Overhead	\$	11,259
2.	General and Administrative Expenses	\$	0
3.	Other Indirect Costs	\$	0
4.	Fee or Profit	\$	<u>0</u>
Total Indirect Costs			<u>\$11,259</u>

TOTAL PROJECT COSTS

\$173,934

¹ Item 10 comprises funds to reimburse electric utilities for payments to study participants (\$52,500 for 1,500 payments averaging \$35 each) and graduate student research fees to support two graduate students for three quarters each, at a cost of \$3,108 per quarter. A mandatory university "Technology Infrastructure Fee" is also included (\$245 total over the course of the study).

Attachment 1

SUBCONTRACTORS' BUDGET SUMMARY

Subcontractor: Stanford University

Description of subcontractor's responsibility: Professor Frank Wolak will serve as co-Principal Investigator, providing 20-50 percent of the effort throughout all phases of this study. Wolak has experience in conducting and evaluating experiments to probe demand response to energy pricing. His personal time and expertise are offered to ARB gratis, with the budget below reflecting support of graduate student researchers.

DIRECT COSTS AND BENEFITS

1.	Labor and Employee Fringe Benefits	\$	30,677
2.	Subcontractors	\$	0
3.	Equipment	\$	0
4.	Travel and Subsistence	\$	0
5.	Electronic Data Processing	\$	0
6.	Reproduction/Publication	\$	0
7.	Mail and Phone	\$	0
8.	Supplies	\$	0
9.	Analyses	\$	0
10.	Miscellaneous	\$	<u>22,688²</u>
	Total Direct Costs	\$	53,365

INDIRECT COSTS

1.	Overhead	\$	3,068
2.	General and Administrative Expenses	\$	0
3.	Other Indirect Costs	\$	0
4.	Fee or Profit	\$	<u>0</u>
	Total Indirect Costs		<u>\$3,068</u>

TOTAL PROJECT COSTS**\$56,433**

² Item 10 covers graduate fees of \$5,279 per quarter for academic year 2009-2010 for two students at two quarters each, plus associated student health surcharges (\$393/quarter).