State of California
AIR RESOURCES BOARD

RESEARCH PROPOSAL

Resolution 07-22

June 21, 2007

Agenda Item No.: 07-7-2

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 2629-256, entitled "Spatial Disaggregated Estimate of Energy-Related Carbon Dioxide for California," has been submitted by the University of California, Berkeley/Lawrence Berkeley National Laboratory to augment contract number 05-310;

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 2629-256, entitled "Spatial Disaggregated Estimate of Energy-Related Carbon Dioxide for California," has been submitted by the University of California, Berkeley/Lawrence Berkeley National Laboratory, for a total amount not to exceed $30,000.

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 2629-256, entitled "Spatial Disaggregated Estimate of Energy-Related Carbon Dioxide for California," has been submitted by the University of California, Berkeley/Lawrence Berkeley National Laboratory, for a total amount not to exceed $30,000.

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 $30,000.

I hereby certify that the above is a true and correct copy of Resolution 07-22, as adopted by the Air Resources Board.

Lori Andreoni

Lori Andreoni, Clerk of the Board

ATTACHMENT A

"Spatial Disaggregated Estimate of Energy-Related Carbon Dioxide for California"

Background

Central to any study of climate change and identification of greenhouse gas (GHG) mitigation strategies is the development of an emission inventory (EI) that identifies and quantifies the primary anthropogenic sources and sinks of GHG emissions. Fossil fuel combustion accounted for 98 percent of gross California carbon dioxide (CO_2) emissions. CO_2 emissions are relatively well characterized at the state level; however no estimates exit at a more disaggregated spatial level. In this study, the investigators propose to enhance a current Air Resources Board (ARB) research contract for improving the CO_2 emission estimates by developing a disaggregated estimate of energy-related CO_2 emissions. Understanding the CO_2 emission profile, finding ways of validating these on a sector-by-sector basis, and providing a validation approach to the statewide GHG EI through disaggregation is an important service for building AB32 GHG EI baselines and projections. This project will provide disaggregated information on these emissions, based on the available data, which can then be evaluated using information from local sources.

Objective

Lawrence Berkeley National Laboratory (LBNL) will build on its experience in constructing an energy balance for California to develop a disaggregated estimate of energy-related CO_2 emissions. The objective is to collect data on energy consumption from stationary and mobile emissions sources at the most disaggregated level of detail possible from official sources and develop energy data that will then be used to calculate CO_2 emissions from fuel combustion.

Methods

The sources of data that will be used for this project include natural gas consumption by major sectors (residential, commercial, industry) at the county level, data for individual refineries, and fuel combustion by power plants. Data on coal consumption by cement plants are only publicly available at the state level. The location of each single cement plant will be determined through the annual industry directory, while data on tons of cement can be estimated using capacity data from the publication "U.S. and Canadian Portland Cement Industry: Plant Information Summary." Energy consumed can then be estimated at the county level based on quantity of cement produced. LBNL will use several comprehensive data sources such as the number of flights and total flight distance for each commercial flight by originating airport, information for marine traffic from individual ports, and railroad activity data to allocate air, vessel, and railroad transport energy use to counties. The disaggregation estimates for road transport (mobile sources) will be directly carried over in-house by ARB staff.

Expected Results

The final report will provide energy consumption by county for each main sector with estimates of CO_2 emissions resulting from fuel combustion. The report will also include

a section on South Coast Air Basin estimates of energy consumption and CO_2 emissions.

Significance to the Board
Understanding the CO_2 emission profile, finding ways of validating these on a sector-by-sector basis, and providing a validation approach to the statewide greenhouse gas emission inventory through disaggregation is an important service for building AB32 GHG EI baselines and projections. This project will provide disaggregated information on these emissions, based on the available data, which can then be evaluated using information from local sources.

Contractor:
University of California, Berkeley/Lawrence Berkeley National Laboratory

Contract Period:
6 months

Principal Investigator (PI):
Michael Hanemann and Lynn Price

Contract Amount:
$30,000

Basis for Indirect Cost Rate:
The State and the UC system have agreed to a ten percent indirect cost rate. The indirect cost rates used by LBNL have been approved and are required the Department of Energy (DOE).

Past Experience with this Principal Investigator:
This Principal Investigator has performed successfully on past contracts with ARB and the California Energy Commission.

Prior Research Division Funding to the University of California, Berkeley:

Year	2006	2005	2004
Funding	$1,713,789	$1,204,449	$920,205

BUDGET SUMMARY

Contractor: University of California, Berkeley/Lawrence Berkeley National Laboratory
"Spatial Disaggregated Estimate of Energy-Related Carbon Dioxide for California"

DIRECT COSTS AND BENEFITS				
1.	Labor and Employee Fringe Benefits	$	15,604	
2.	Subcontractors	$	0	
3.	Equipment	$	0	
4.	Travel and Subsistence	$	0	
5.	Electronic Data Processing	$	0	
6.	Reproduction/Publication	$	1,116	
7.	Mail and Phone	$	0	
8.	Supplies	$	0	
9.	Analyses	$	0	
10.	Miscellaneous	$	0	
	Total Direct Costs			$16,720
INDIRECT COSTS				
1.	Overhead	$	2,730	
2.	General and Administrative Expenses	$	10,252	
3.	Other Indirect Costs	$	298	
4.	Fee or Profit	$	0	
	Total Indirect Costs			$13,280[1]
TOTAL PROJECT COSTS				**$30,000**

[1] LBNL indirect budget justification: The scientific staff fringe benefit rate is 26.3 percent for career staff. These rates are standard to all projects and are approved by the DOE. The organization burden is 17.5 percent on salary and fringe benefits only. The rate is standard to all projects and is approved by DOE.