

**Working Group Report on
Public Interest
Research, Development
& Demonstration
Activities**

Report of the RD&D Working Group

Prepared in Response to the
California Public Utilities Commission
Decision 95-12-063

September 6, 1996

P500-96-010

**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA**

**Order Instituting Rulemaking on the)
Commission's Proposed Policies)
Governing Restructuring California's)
Electric Services Industry and)
Reforming Regulation)**

**R.94-04-031
(Filed April 20, 1994)**

**Order Instituting Investigation on the)
Commission's Proposed Policies)
Governing Restructuring California's)
Electric Services Industry and)
Reforming Regulation)**

**I.94-04-032
(Filed April 20, 1994)**

**WORKING GROUP REPORT ON
PUBLIC INTEREST RD&D ACTIVITIES**

**Submitted by the RD&D Working Group
Submitted on September 6, 1996**

CALIFORNIA ENERGY COMMISSION

1516 NINTH STREET
SACRAMENTO, CA 95814-5512



September 6, 1996

Commissioner Josiah L. Neeper
Assigned Commissioner on Public Purpose Programs
California Public Utilities Commission
505 Van Ness Avenue, Room 5213
San Francisco, CA 94102-3298

Re: Submittal of RD&D Working Group Report

Dear Commissioner Neeper:

The Research, Development and Demonstration (RD&D) Working Group hereby submits its Final Report in response to the California Public Utilities Commission's request for information regarding energy RD&D in a restructured electric industry. The report includes information concerning the following topics identified by the CPUC in its electric industry restructuring decisions:

- boundaries between competitive, regulated, and public goods research;
- public goods RD&D costs;
- transition requirements to an independent administrator;
- natural gas program impacts; and
- required legislation or regulation changes.

The report describes and evaluates several surcharge funding level and administration options. RD&D Working Group members have agreed to state their preferences and positions on specific options in the comments they will subsequently file on this report.

The RD&D Working Group is aware that the California Legislature recently passed comprehensive electric industry restructuring legislation. We recommend that organizations involved in planning and implementing that legislation use this report to inform their decision making process.

Commissioner Josiah L. Neeper
September 6, 1996
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The RD&D and Energy Services Working Groups will jointly submit a report concerning integration issues affecting these public purpose programs on October 4, 1996.

Sincerely,



Mike DeAngelis, on behalf of the
RD&D Working Group:

California Department of Water Resources
California Energy Commission Staff
Division of Ratepayer Advocates (CPUC)
Electric Power Research Institute
Natural Resources Defense Council
Pacific Gas & Electric Company
Pacific Lumber Company
Sacramento Municipal Utility District
San Diego Gas & Electric Company
Solar Turbines, Inc.
Southern California Edison Company
Southern California Gas Company
Union of Concerned Scientists
University of California
Weinberg Associates

cc: President P. Gregory Conlon
Commissioner Daniel Wm. Fessler
Commissioner Henry M. Duque
Commissioner Jessie J. Knight, Jr.
Michelle Cooke, CACD
RD&D Working Group Mailing List
CPUC Electric Restructuring Service List (Notice of Availability)

PREFACE

The Research, Development and Demonstration (RD&D) Working Group is aware that the California Legislature has recently passed comprehensive legislation concerning electric industry restructuring. We strongly recommend that affected organizations utilize this report in reviewing and implementing the RD&D portion of that comprehensive legislation.

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EXECUTIVE SUMMARY FOR RD&D WORKING GROUP REPORT

A. SIGNATORIES TO THIS RD&D WORKING GROUP REPORT

The following parties have participated in the preparation of, and are signatories to, this report:

Pacific Gas and Electric Company
San Diego Gas and Electric Company
Southern California Edison Company
Southern California Gas Company
Sacramento Municipal Utility District
California Department of Water Resources
Division of Ratepayer Advocates (CPUC)
California Energy Commission Staff

Electric Power Research Institute
University of California
Union of Concerned Scientists
Natural Resources Defense Council
Pacific Lumber Company
Solar Turbines Inc.
Weinberg Associates

B. PURPOSE OF THIS RD&D REPORT

This report is submitted by the Research, Development and Demonstration (RD&D) Working Group (WG) in response to the California Public Utilities Commission (CPUC) request for information regarding energy RD&D activities in a restructured environment. In its electric industry restructuring decisions, the CPUC requested information regarding the following topics:

- boundaries between competitive, regulated, and public goods research;¹
- public goods RD&D costs;
- transition requirements to an independent administrator;
- natural gas program impacts;
- required legislation or regulation changes; and
- integration of public purpose program recommendations.

This report contains information regarding the first five of these items. The RD&D and Energy Services Working Groups will jointly submit a report integrating the recommendations of the Working Groups on October 4, 1996.

C. KEY FINDINGS AND CONCLUSIONS

Key points on which the WG reached consensus are summarized in the following discussion, and set forth collectively in Table 1 located at the end of this Executive Summary. Additional

¹ The WG adopted the term "public interest" RD&D for its discussions in order to avoid confusion, which has occurred in the past, with regard to the strict economic definition of the term "public good." The WG used the terms "public goods charge," "PGC," "public interest surcharge," and "surcharge" interchangeably throughout this report.

information regarding the WG conclusions and recommendations can be found in the relevant chapters of this report.

1. Introduction to RD&D Report (Chapter I)

For more than 20 years a three-way collaborative effort among the government, the private sector, and the state's regulated utilities has ensured that energy-related RD&D activities provided both public and private goods for the benefit of California's citizens. The CPUC has expressly observed that "[t]he need for activities performed in the public interest will continue in the future, but the role of electric utilities as providers of these services is less clear." The WG was organized to respond to specific issues pertaining to public interest RD&D activities in a restructured energy market.

To prepare this report, the WG held twelve public, day-long meetings throughout the state from March to September 1996. The WG sought to reach consensus wherever possible, and developed pros and cons for options when consensus could not be reached. The WG agreed that when evaluating options for ensuring that the benefits of public interest RD&D activities are not lost in the emerging competitive environment, it would consider the following "governing principles." Public interest RD&D activities should be funded and administered in a manner which (1) is efficient and socially responsible; (2) is equitable; (3) avoids or minimizes unfair competition; and (4) is flexible and encourages collaboration.

2. Defining the Boundaries For RD&D Activities (Chapter II)

The WG recognized that there are natural overlaps and/or spillovers which occur between competitive, regulated and public interest RD&D activities. Therefore, in recognition of these overlaps, and in keeping with a less restrictive regulatory environment, the WG agreed that boundary definitions between competitive, regulated and public interest RD&D activities should be broad and flexible. The RD&D boundary definitions agreed to by the WG are as follows:

Competitive RD&D activities are directed toward developing science or technology, the benefits of which can be appropriated by the private sector entity making the investment.

Regulated RD&D activities are directed toward developing science or technology, the benefits of which are related to the regulated functions of the entity making the investment.

Public Interest RD&D activities are directed toward developing science or technology, 1) the benefits of which accrue to California citizens and 2) that are not adequately addressed by competitive or regulated entities.

The WG also recognized that there is a continuum between the boundaries of RD&D and commercialization activities; however, the WG did not agree on the extent of appropriate public interest commercialization activities. In addition, the WG agreed that collaboration among public

interest entities and competitive and regulated firms should be encouraged, provided that such activities do not lead to unnecessary duplication or unfair competitive advantage.

3. Funding of Public Interest RD&D Activities (Chapter III)

The WG approached the public interest RD&D funding level issue by determining (1) the appropriate types of activities to be funded; (2) the appropriate sources of funding; and (3) the appropriate methods for estimating the level of funding.

a. Appropriate Types of RD&D Activities

The WG agreed that public interest RD&D activities should focus on the following areas: energy efficiency, renewable technologies and environmental issues. Although the WG has emphasized the importance of broad and flexible boundary definitions, the WG agreed that some activities should not be included within the scope of the public interest RD&D funding at this time, e.g., Independent System Operator/Power Exchange-related activities, nuclear decommissioning and transportation. Regarding transportation, the CPUC has specifically directed that transportation RD&D activities be treated as a regulated function. However, if the scope of these regulated RD&D activities decreases in the future, then the WG believes that it may be appropriate to reconsider funding some transportation RD&D activities through the public goods charge.

While the surcharge should cover the full range of research, development and demonstration activities, the WG recognizes the importance of relating RD&D activities to potential market applications. Therefore, the WG recommends that the public interest research organization should not be precluded from considering smaller-scale technology commercialization activities, primarily those related to RD&D activities undertaken using surcharge funds. Such activities address information, market and regulatory barriers to technology adoption. There was no consensus regarding whether larger-scale technology commercialization activities should be funded out of public interest RD&D surcharge funds.

b. Appropriate Funding Sources For RD&D Activities

Most of the WG agreed that, without some level of public funding support, restructuring of the electric utility industry will lead to a reduction in statewide public interest RD&D benefits. To address this problem, and to be consistent with the principles for public interest RD&D, most of the WG also agreed that the surcharge should be based on both electricity and natural gas retail consumption. However, one party believes that the surcharge should not include natural gas. Notwithstanding this difference, the WG reached a consensus that, if a surcharge is imposed on both electricity and natural gas consumption, then all retail consumers (e.g., retail customers of IOUs, municipal utilities, independent power producers and gas pipeline companies) should pay the public goods charge.

Several municipal utilities in the WG expressed support for a surcharge upon all retail consumers, including municipal utility customers, provided that municipal utilities have the option to manage

the surcharge funds collected from their ratepayers, in lieu of the public interest research organization.

c. Methods For Determining Appropriate RD&D Funding Levels

The report discusses several calculation methods for determining the appropriate level of funding for public interest RD&D activities, including pros and cons of the various methods discussed. Members of the WG could not reach consensus on which of these methods is most appropriate for establishing the level of the public interest RD&D surcharge, but feel that policy makers should be aware of these methods in seeking to make an informed decision.

d. Recommended Public Interest RD&D Funding Levels

This report contains four public interest RD&D funding level options ranging from \$20 million to \$225 million, as detailed in Table 2, for consideration by the CPUC. These options were derived from the basic methodologies mentioned above. Each option represents the view of at least one WG member as to the appropriate level of public interest RD&D funding. The four options and their associated funding levels (rounded to the nearest \$5 million) are:

Funding Level Estimates	Social Investment Level	Traditional Scope Level	Narrow Scope Level	Limited Funding Level
Base Level RD&D Activities	\$165 million	\$75 million	\$40 million	\$20 million
Larger-scale Commercialization	\$60 million	\$50 million	\$25 million	none
Total Funding	\$225 million	\$125 million	\$65 million	\$20 million

The WG did not reach consensus on the duration of the public interest RD&D surcharge, but agreed that the surcharge options should incorporate varying views on this topic. The WG recognized that surcharge collection and adjustment is an issue, but elected not to make independent recommendations regarding the collection of the public interest RD&D surcharge. The WG recommends that the CPUC consider these issues in the context of other restructuring funding issues.

4. Administration of Public Interest RD&D Funds (Chapter IV)

The WG agreed that the organization responsible for administration of the public interest RD&D surcharge, generically called the Research Organization (RO), has three goals: to serve the broad public interest, support state energy policy, and address the needs of consumers. These goals will be addressed through four principal functions: policy making, planning, conducting RD&D activities, and RD&D administration. The WG developed the following performance criteria for the RO: provide an open planning process; conduct effective and efficient program implementation; maintain public accountability; and collaborate to effectively leverage funds and enhance RD&D infrastructure.

The WG concluded that there are three major options for the governance and administration of the RO: an integrated, multi-purpose statewide entity; an independent, single-purpose RD&D institution; or a utility administrator. Among the key distinguishing features of these three options are: (1) the relationship of public interest RD&D programs to statewide energy policy; (2) the relationship of public interest RD&D programs to other public interest energy programs; (3) the level of activities conducted by the RO itself; and (4) the degree of statewide or local administration of the funds.

In the integrated, multi-purpose statewide administrator option, public interest RD&D would be integrated within an organization's broader energy policy charter. The integrated organization would be responsible for energy policy and planning, as well as the execution of RD&D activities and other public interest energy programs. In the independent, single purpose administrator option, public interest RD&D would be the sole function of the organization, and RD&D policy and planning functions would be conducted by an independent board. In the utility administration option, utilities would have the choice of managing some or all of their portion of the public interest RD&D surcharge while maintaining their charter for energy services, and the policy and planning functions would be shared by the utility and a board overseeing utility and statewide RD&D programs. A more detailed description of these options is included in Sections C and D of Chapter IV.

These three options can be implemented in various ways, or in combinations, and the WG focused on four specific proposals, summarized in Table 3. The four specific proposals are:

- Integrated, Multipurpose Administrator
- Independent, Single Purpose Administrator - Classic
- Independent, Single Purpose Administrator - Contract Manager
- Utility Administrator

The WG could not agree on which particular organization or organizational structure would best administer the public interest RD&D program. Therefore, the report presents pros and cons concerning the four specific proposals for policy makers to consider.

5. RD&D Transition and Implementation Issues (Chapter V)

The WG discussed and evaluated a number of options for selecting an organization to serve as the administrator of public interest RD&D. These include selecting among existing organizations, modifying an existing organization, forming a new organization, or doing a competitive solicitation. The pros and cons of the selection choices are listed in Chapter 5.

Chapter 5 also identifies and addresses a number of other important transition questions, including the following: When should collection of public interest RD&D funds begin? What should be done with existing public interest RD&D programs in the interim? How can public interest RD&D programs be smoothly transferred from utilities to the research organization? What CPUC and Legislative actions are necessary?

TABLE I
RD&D WORKING GROUP CONSENSUS POINTS

<p>Chapter I: Introduction To RD&D Report</p> <p>Public interest RD&D activities should be funded and administered in a manner which:</p> <ul style="list-style-type: none"> • is efficient and socially responsible; • is equitable; • avoids or minimizes unfair competition; and • is flexible and encourages collaboration. 	<p>Chapter II: Defining The Boundaries For RD&D Activities</p> <ul style="list-style-type: none"> • Boundary definitions for competitive, regulated and public interest RD&D should be broad and flexible; • RD&D boundary definitions are: <ul style="list-style-type: none"> <i>Competitive RD&D activities are directed toward developing science or technology, the benefits of which can be appropriated by the private sector entity making the investment.</i> <i>Regulated RD&D activities are directed toward developing science or technology, the benefits of which are related to the regulated functions of the entity making the investment.</i> <i>Public Interest RD&D activities are directed toward developing science or technology, 1) the benefits of which accrue to California citizens and 2) that are not adequately addressed by competitive or regulated entities.</i> <ul style="list-style-type: none"> • There is a continuum between the boundaries of RD&D and commercialization activities; and • Collaborative RD&D efforts should be encouraged.
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TABLE 1 (continued)

RD&D WORKING GROUP CONSENSUS POINTS

Chapter III: Funding Of Public Interest RD&D Activities

- Surcharge RD&D activities should focus on energy efficiency, renewable technologies and environmental issues;
- Surcharge funds should not support RD&D activities for nuclear decommissioning;
- Surcharge funds should not support RD&D activities in direct support of ISO or PX operations;
- Surcharge funds should focus on RD&D activities, but these activities should be connected to market;
- The research organization should not be precluded from considering some technology commercialization activities, primarily related to RD&D activities undertaken using surcharge funds;
- If a surcharge is imposed on both electricity and natural gas consumption, then all retail consumers (e.g., retail customers of IOUs, munis, IPPs, and gas pipelines) should pay the public goods charge for public interest RD&D; and
- Details of surcharge assessment, collection and inflation adjustment methods are broader restructuring implementation issues.

Chapter IV: Administration Of Public Interest RD&D Funds

- Research organization goals: serve the broad public interest, support state energy policy, and address the needs of consumers;
- Research organization functions to be discussed in organizational options are: policy making, planning, conducting RD&D, and RD&D administration;
- Research organization performance criteria: open planning process; effective and efficient program implementation; maintaining public accountability; and collaborating to effectively leverage funds and enhance RD&D infrastructure; and
- There are three basic governance options (with potential variations and combinations): an integrated, multi-purpose statewide entity; and independent, single-purpose RD&D entity; and a utility administrator option.

Chapter V: RD&D Transition And Implementation Issues

- Failure to collect surcharge funds prior to January 1, 1998, could delay implementation of the public interest RD&D program;
- Utilities should be allowed to continue public interest RD&D activities until the RO is functional;
- Utilities and the RO should coordinate to ensure an orderly transition for public interest RD&D activities.

TABLE 2

SUMMARY OF SURCHARGE FUNDING OPTIONS

Surcharge Description	Social Investment Level	Traditional Scope Level	Narrow Scope Level	Limited Funding Level
Activity Scope	Focus on energy efficiency, renewables and environmental issues.	Focus on energy efficiency, renewables and environmental issues, as well as some advanced non-renewable generation and storage.	Focus on energy efficiency, renewables and environmental issues.	Focus predominantly on energy efficiency, but also include customer-sited renewables and some environmental issues.
Funding Methodology	Scale RD&D to 1 % of GOR	Project-by-Project	Project-by-Project	Hybrid
Limited-Scale Commercialization Scope	Identify regulatory barriers; facilitate collaboratives; provide impartial information to investors and consumers.	Identify regulatory barriers; facilitate collaboratives; provide impartial information to investors and consumers.	Provide targeted information regarding surcharge-funded RD&D results to develop products with near-term potential application.	Provide limited information only.
Larger-Scale Commercialization Scope	Provide funding to bring new technologies down the cost curve.	Provide funding to fill the public interest commercialization gaps in other public policy programs.	Provide funding for large-scale renewable demonstrations, if not covered elsewhere.	None
Funding Level Estimates				
A. Base Level (electric, gas, munis, limited-scale commercialization)	\$165 million	\$75 million	\$40 million (includes research contributions)	\$20 million
B. Larger-scale Commercialization	\$60 million	\$50 million (if necessary)	\$25 million (if necessary)	\$0
C. Total Funding Level (A + B)	\$225 million (total)	\$125 million (total)	\$65 million (total)	\$20 million (total)
Duration	Review and adjust as necessary.	Review and adjust as necessary.	Review every 5 years for adjustment or possible discontinuation, if appropriate.	Discontinue when: 1) Full direct access; 2) All retail service divested from wires company; 3) All generation, including ancillary services divested from wires company.

TABLE 3

SUMMARY OF PUBLIC INTEREST RD&D ORGANIZATIONAL OPTIONS

Category of Organization	Integrated/Multi-Purpose	Single Purpose (Classic)	Single Purpose (Research Contracts Administrator)	Utility Administrator
Structure	Multi-purpose state energy policy board, executive officer and expert staff in one statewide organization.	Single purpose board of directors (does not make state energy policy), executive officer and expert staff in one statewide organization.	Single purpose board of directors (does not make state energy policy) and a research contracts administrator in one statewide organization.	Single purpose board of directors (does not make state energy policy) and both a research contracts administrator and various utility administrators located throughout the state.
Board	Expert Disinterested Full-time Small Legislatively approved.	Expert Disinterested Part-time Large Appointed by CPUC or other public body.	Expert Stakeholder Part-time Large Appointed by CPUC or Governor.	Expert Stakeholder Part-time Large Appointed by CPUC or Governor.
Policy Making Functions				
Develop state energy policy?	Yes	No	No	No
Provide input to state policy?	Yes	Yes	Yes	Yes
Responsible party?	Governing authority	Board	Board	Board and utilities
Planning Functions				
Developed by whom?	Executive officer and staff.	CEO, with stakeholder advisory committee input.	Board (research objectives only)	Board (develops statewide research agenda) and utilities (develop plans).
Reviewed/approved by whom?	Governing authority	Board	Board approves solicitation outcome.	Board approves solicitation outcome.
Implementing RD&D				
	RO contracts out most of the RD&D activities. In-house activities permitted in limited circumstances.	RO contracts out most of the RD&D activities. In-house activities permitted in limited circumstances.	RO contracts out all RD&D activities through the RFP process.	RO contracts out all RD&D activities through the RFP process. Utilities both contract out and manage in-house activities.
Administrative Functions				
Evaluations	Periodic, by staff.	CEO establishes tracking and review system.	Board oversees administrator functions.	Statewide board evaluates utility and administrator functions.
Audits	Every five years by Legislature or designee.	Every three years by panel appointed by Legislature or other public body.	Annual audits of research contracts administrator.	Periodic audits of utility and administrator.

CHAPTER I: INTRODUCTION

A. BACKGROUND CONCERNING THIS RD&D WORKING GROUP REPORT

For more than 20 years California has led the nation in a wide variety of energy-related research, development and demonstration (RD&D) activities, thereby developing and deploying some of the cleanest and most efficient energy technologies in the world to date. This exceptional RD&D achievement has been accomplished through a three-way collaborative effort among government, the private sector, and the state's regulated energy utilities, thus ensuring that both public and private goods were produced for the benefit of California's citizens, and that various market failures were identified and addressed in the process.

Now, as the state moves rapidly toward deregulation of its electric services industry, the California Public Utilities Commission (CPUC) has expressly observed that "[t]he need for activities performed in the public interest will continue in the future, but the role of electric utilities as providers of these services is less clear." (D. 95-12-063, p. 144; and D. 96-03-022, pp. 26-27). In preparing for impending competition, several of the state's major investor-owned electric utilities have already reduced their RD&D budgets, and the CPUC has indicated that only those utility RD&D activities which continue to support "regulated functions" should be funded through rates in the future. (D. 95-12-023, p. 158; and D. 96-03-022, p. 28).

However, the CPUC has also clearly stated that those RD&D activities which serve a "broader public interest . . . should not be lost in the transition to a more competitive environment." (D. 95-12-023, pp. 158 and 198). To address this concern the Commission has expressly recommended that a non-bypassable surcharge on retail sales be collected to provide for public goods RD&D efforts in the future. (D. 95-12-023, pp. 145, 160 and 213; and D. 96-03-022, p. 28). The Commission has also emphasized that this public goods charge (PGC) "should collect funds only for public goods research, not . . . for regulated or competitive research functions." (D. 95-12-023, p. 160 and 213).

B. DESCRIPTION OF THE RD&D WORKING GROUP PROCESS

In its December 1995 Restructuring Decision the Commission stated: "We anticipate that our implementation of this decision will include workshops to develop information to allow us to establish boundaries between competitive, regulated, and public goods research, and to develop the public goods RD&D costs and transition policies for an independent administrator." (D. 95-12-023, pp. 160-161). Subsequently, in its March 13, 1996 "Roadmap" Decision, the Commission stated that: "We [will] need information on how to differentiate between competitive, regulated and public goods research. These proposals should [also] develop reliable cost estimates for public goods RD&D costs and discuss transition requirements to an independent administrator." (D. 96-03-022, pp. 28-29). The Commission expressly called for the formation of working groups on specific restructuring topics, and established filing dates for the reports prepared by these groups. (D. 96-03-022, pp. 30-31).

Shortly after the "Roadmap" Decision was issued, the RD&D Working Group (WG) was organized and began working on this report. The WG participants represented a broad cross-section of California entities concerned about "public interest" RD&D.¹ The mailing list comprised over forty parties, including investor-owned utilities, municipal utilities, research organizations, state agencies and public interest organizations. (See Appendix I). Representatives from more than a dozen organizations regularly attended WG meetings and participated actively in the preparation of this report.

This WG held twelve separate, day-long meetings between March 26 and September 4, 1996, and these meetings were conducted at various locations throughout the state (e.g., Burbank, San Francisco, Berkeley and Sacramento). Each meeting was publicly noticed and was open to anyone who wished to attend.

The WG agreed to strive for consensus on key issues where possible, and to provide an accurate "sense of the group," including the pros and cons of different options, where consensus could not be reached. (See Appendix I B for all meeting minutes prior to the WG's adoption of this report on September 4, 1996). The WG specifically adopted the following broad "Mission Statement" at its first meeting:

"To bring energy research, development and demonstration (RD&D) stakeholders together to strive for timely, well-supported consensus recommendations on RD&D and related issues identified in the CPUC restructuring order for use in decision making regarding energy RD&D activities."

The WG also agreed to consider the following "governing principles" when evaluating various options for ensuring that the benefits of public interest RD&D are not lost in the emerging competitive environment:

- (1) public interest RD&D activities should be funded and administered in an efficient and socially responsible manner;
- (2) public interest RD&D activities should be funded and administered in an equitable manner which ensures that the beneficiaries of these activities contribute fairly to the funding, and that those who fund these efforts receive a fair share of the benefits (i.e., "free-ridership" and cross-subsidies should be minimized or avoided);
- (3) public interest RD&D activities should be funded and administered in a manner which avoids or minimizes unfair competition, and promotes a competitive "level playing field"; and
- (4) since public interest RD&D activities cannot be clearly isolated from regulated and competitive RD&D activities, flexibility and collaboration is essential in the administration of public interest RD&D funds.

¹ The WG adopted the term "public interest" RD&D for its discussions in order to avoid confusion, which has occurred in the past, with regard to the strict economic definition of the term "public good." In addition, the WG uses the terms "public goods charge," "PGC," "public interest surcharge," and "surcharge" interchangeably throughout this report.

C. BRIEF OVERVIEW OF THE RD&D CHAPTERS WHICH FOLLOW

After the WG reached consensus on a decision-making process, "mission statement" and broad "governing principles," it turned to the substantive RD&D issues on which the CPUC is seeking input. These issues are addressed in the remaining chapters of this report.

Chapter II deals specifically with the issue of whether sharp definitional boundaries can be established between competitive, regulated and public interest RD&D activities. As the chapter explains, the WG has concluded that there is an inevitable "spillover" of benefits which accrue from competitive, regulated and public interest RD&D activities, and "bright-line" boundaries simply cannot be drawn. Therefore, the WG has intentionally developed broad definitions with general examples for each of the three RD&D categories, in order to provide the RD&D administrator with some reasonable flexibility in the use of public interest funds. Chapter II also discusses certain boundary issues which arise between "research," "development," "demonstration" and "commercialization" activities, and contains recommendations accordingly.

Chapter III addresses a number of important RD&D funding issues, including the following: (1) What types of RD&D activities should be funded with available public interest surcharge funds? (2) Who should pay for these efforts (e.g., electric customers, gas customers, IOUs only, municipal utilities)? (3) What method should be used to establish the appropriate level of public interest RD&D funds? and (4) What should be the actual dollar amount for public interest RD&D activities?

Chapter IV addresses various issues and options pertaining to the governance and administration of public interest RD&D efforts. The WG first reached consensus on certain goals, functions and criteria for the governance and administration of these efforts, and then identified several structural options for the research organization, including the pros and cons of each option. Since no clear consensus on a "preferred" administrative option emerged, parties intend to state their specific preferences in comments to be filed with the CPUC subsequent to this report.

Finally, Chapter V discusses a number of important "transition" issues which must be addressed concerning public interest RD&D activities. For example, how should the new research organization be selected? When should RD&D surcharge funds start to be collected? What public interest RD&D activities, if any, should the utilities continue to fund until an independent RD&D administrator is selected and operational? How can existing public interest RD&D activities be smoothly transferred from the utilities to the independent administrator?

CHAPTER II: DEFINING THE BOUNDARIES FOR RD&D ACTIVITIES

A. OVERVIEW OF BOUNDARY ISSUES

1. CPUC Direction/Guidance

In its December 1995 Restructuring Decision, and in subsequent guidance to all interested parties, the CPUC expressed a desire for information about the boundaries between competitive, regulated and public goods RD&D. The RD&D Working Group (WG) used the following citations to frame its boundary discussions and develop the recommendations included in this chapter.

"We anticipate that our implementation of this decision will include workshops to develop information to allow us to establish boundaries between competitive, regulated, and public goods research." (D. 95-12-023, pp. 160-161);

"We need information on how to differentiate between competitive, regulated and public goods research." (D. 96-03-009, p. 16);

"We recognize that drawing the line between competitive, regulated, and public goods RD&D activities will be difficult. For example, under our adopted minimum renewables requirement, the competitive market will likely pursue renewables research, but such research has often been considered public goods research. Research related to nuclear waste management, which is tied to nuclear generation, is another area that may provide public benefits but is a component of generation-related RD&D. As these examples demonstrate, research often results in benefits to the general public without having these benefits as its primary focus." (D. 95-12-023, p. 160 and accompanying footnote #65); and

"We will also work with the Legislature to change §§ 740.1 and 740.3, and we will modify existing Commission decisions to implement these policies, assuming the Legislature agrees with us." (D. 95-12-023, p. 161).

2. The Working Group's Approach To RD&D Boundary Issues and Definitions

In order to respond to the CPUC's charge to delineate the boundaries among competitive, regulated and public goods RD&D, the WG first examined the context in which these definitions are to be applied. Broadly speaking, we discern two possible paradigms for the application of these definitions. Under the traditional regulatory paradigm, monopoly utilities serve as the primary providers of a wide range of regulated and public interest energy functions, including generation, transmission/distribution and, to some extent, end-use services. In this paradigm, all utility activities are closely scrutinized and regulated to ensure an appropriate and efficient use of ratepayer funds. Thus, in this context, relatively detailed definitions of appropriate RD&D activities are necessary to achieve these goals. Such detailed definitions have been provided by

FERC, the CPUC and the Legislature. (See Appendix II A-C for existing definitions and possible modifications).

The evolution of energy technologies and institutional structures is making this traditional regulatory framework increasingly obsolete and a new paradigm is rapidly taking its place. The new paradigm utilizes the competitive market wherever possible (e.g., electricity generation), and for those remaining regulated functions where robust competition is inhibited by economies of scale or scope (e.g., transmission/distribution), regulators are now developing performance-based ratemaking (PBR) to replace cost-based ratemaking. For public interest programs which do not respond well to either competitive or PBR mechanisms, new administrative structures will need to be developed by Legislature and/or the CPUC. Under this emerging paradigm shift, the WG found that a less restrictive approach towards RD&D boundary definitions is appropriate. This approach relies on market incentives and appropriate governance structures, rather than on detailed and inflexible definitions, to ensure accountability and appropriate use of ratepayer funds.

The WG members also recognized that there are natural overlaps and/or spillovers among various types of RD&D activities and benefits. This further dissuaded the group from attempting to draw "bright-line" definitional boundaries. For example, some believe that RD&D activities pertaining to distributed generation technologies could be carried out by either competitive, regulated or public interest entities, depending on the time-frames and/or specific applications of the efforts in question. Similarly, the benefits from such activities could accrue to either the private sector, the regulated sector or the public sector, or could spillover to all three.

Since the categories of competitive, regulated and public interest RD&D are interconnected in so many ways, the WG decided that any attempt to draw clear and distinct boundaries among these categories in legislation or regulation would inevitably lead to a sub-optimal allocation of resources. The WG concluded instead that boundary decisions are best made on a case-by-case basis by the appropriate governing organization. Accordingly, we provide broad boundary definitions for competitive, regulated and public interest RD&D in Sections B, C and D of this chapter. We expect that these definitions will be used for general policy guidance, and we recognize that they are not suitable for old-style compliance proceedings.

The WG realizes that the recommended boundary definitions will occasionally lead to overlaps of interest in specific RD&D projects. However, this should not be viewed as an inefficient or otherwise undesirable outcome. When broad definitional boundaries result in two or more organizations pursuing the same RD&D activity, there is a potential for useful collaboration. The rules for the restructured market should permit public interest entities to collaborate with competitive and regulated firms, and with each other, provided that such activities do not lead to unnecessary duplication or unfair competitive advantage.

Finally, we have developed our boundary definitions on the assumption that, after a period of transition, RD&D in the remaining regulated parts of the utility industry will be conducted under PBR mechanisms. We note that RD&D activities conducted by California utilities are currently being regulated using cost-based balancing accounts. The WG made no recommendations for the

future regulation of these balancing accounts. We believe that disposition of these accounts should continue to be determined through appropriate General Rate Case or PBR proceedings.

3. Other RD&D Boundary Issues

a. A Broad Definition For RD&D

The terms "research," "development," and "demonstration" are used throughout this report. Therefore, the WG believes that it is important to provide the reader with appropriate definitions for these terms, while recognizing again that "bright-line" boundaries among these activities do not always exist.

Under the old paradigm of cost-based regulation the CPUC used a modified version of the FERC definition of RD&D as its guideline in determining the appropriateness of proposed activities. In a restructured environment we believe that this definition is not an appropriate one to use. We offer the following definition(s) instead:

Research, development and demonstration (RD&D) is the process of advancing science and technology from the initial stages of exploring a concept, through the laboratory and applications-testing of components and systems, to the eventual introduction into the market. RD&D consists of three elements, research, development and demonstration, defined as follows:

(1) Research: The process used to discover fundamental new knowledge;

(2) Development: The application of new knowledge to develop a potential new technology or product;

(3) Demonstration: The early application and integration of a new technology or product into an existing system.

b. The Commercialization Boundary in RD&D Activities

Since traditional RD&D activities alone do not deliver a product to market, there may be a gap between the demonstration phase of a technology and the actual market sale of a product which causes a technology to go unused. This potential gap raises questions about whether regulated or public interest entities should ever be involved in commercialization activities and, if so, how much of their resources should be allocated to such activities. These questions are addressed specifically in Sections B and E of Chapter III, but it is important to note here that the WG has not, *a priori*, excluded all commercialization activities from consideration.

Although the WG definition of RD&D, above, does not specifically include commercialization, we wish to emphasize the importance of carrying new or improved technologies and products into the marketplace. Just as the natural overlap of boundaries prevents us from drawing clear distinctions among competitive, regulated and public interest RD&D, so too does the natural process of

technology development prevent us from creating "bright-line" boundaries between RD&D activities and commercialization activities. There is a broad spectrum of activities that comes under the rubric of commercialization, but these activities are all aimed at reducing market barriers that would slow or prevent technologies or products from reaching consumers. As indicated above, the size and scope of public interest commercialization activities are discussed further in Chapter III. Further commentary on the continuum between research, development, demonstration and commercialization activities is included in Appendix II D.

B. COMPETITIVE RESEARCH

"We do not intend for the surcharge to collect funds to pursue research that the competitive market will provide on its own." (D. 95-12-023, p. 160).

1. Proposed Definition For Competitive RD&D Activities

Competitive RD&D activities are characterized by their contribution to the profits of the entity conducting these activities. While competitive RD&D activities may have spillover benefits to other parties, they are primarily viewed as investments by the companies making them.

Economic criteria, such as rate of return, risk/reward ratio, pay-back time, capitalization and security, all play a significant role within the competitive RD&D rubric. While the WG recognizes these economic factors, we do not intend to analyze them but we have taken them into account in proposing the following definition for competitive RD&D:

Competitive RD&D activities are directed toward developing science or technology, the benefits of which can be appropriated by the private-sector entity making the investment.

2. Examples of Competitive RD&D Activities

Examples of competitive RD&D activities include research to provide near-term efficiency improvements for some existing generating facilities; development of lower operation and maintenance cost technologies for industrial boilers; and demonstration of new misting devices for cooling outdoor shopping centers.

3. Scope/Activity Emphasis For Competitive RD&D

The scope of activities for competitive RD&D are whatever is determined by the owners (or their designees) to be in their best interest. In the early years of restructuring, the WG anticipates that competitive RD&D will target emerging markets for products and services, primarily in generation and energy services. Research will likely focus on product development and process enhancement, primarily on incremental improvements that can be brought to market quickly.²

² By comparison, the competitive telecommunications industry has invested heavily in applications of the fiber-optic and cellular communications technologies developed at Bell Labs before the 1984 breakup of the regulated AT&T monopoly, and in the software necessary to manage an enlarged range of communications services. The

Competitive RD&D activities will target improvements that distinguish products and services and offer a competitive advantage to the provider.

4. Stakeholders/Participants In Competitive RD&D

Competitive RD&D activities are expected to be pursued by a broad range of participants in the energy services market, including unregulated utility subsidiaries, energy service companies, generators and equipment manufacturers. The principal stakeholders in competitive RD&D activities are the owners, employees and customers of profit-seeking entities. Although others may benefit from competitive RD&D decisions, they are not the primary stakeholders. Partnerships or collaborations may enlarge the stakeholder base for particular RD&D projects. In addition, manufacturers of related products, small businesses, regulated utilities, etc. may also be important participants.

5. Funding and Administration For Competitive RD&D

Competitive RD&D funding will continue to be determined by the private sector. In the near future, funding levels are unlikely to expand beyond current levels because few competitors will be willing to put investment at risk until the restructuring outcome is more predictable. Unless risk taking entrepreneurs commit resources to attempt to establish a lead position, the WG would not anticipate any significant increase in competitive RD&D investments in the latter half of this decade.

6. Changes in Regulation or Legislation For Competitive RD&D

No additional regulation or legislation is needed for competitive sector RD&D activities at this time. Any controls deemed necessary to minimize cross-subsidization between a regulated utility and its competitive affiliates would more properly be placed on the regulated entity.

C. REGULATED RESEARCH

"Funds for research in support of regulated functions properly remain part of regulated rates." (D. 95-12-023, p. 160).

1. Proposed Definition Of Regulated RD&D Activities

The WG assumes that under PBR mechanisms the motivation for regulated (IOU) companies will be to maximize profits by increasing the cost-effectiveness of the regulated services which they provide. While overall rates will remain regulated, RD&D activities funded by these companies will not be scrutinized so long as balancing accounts are not utilized. Since these companies,

basic technologies were developed under utility regulation. (Source: Robert T. Blau, Director of Policy Analysis, Bell South Corporation, July 1996).

rather than the regulators, will now need to insure that their RD&D investments are wisely spent, we propose the following definition:

Regulated RD&D activities are directed toward developing science or technology, the benefits of which are related to the regulated functions of the entity making the investment.

2. Examples Of Regulated RD&D Activities

In general, the management of each individual regulated utility will be in the best position to determine appropriate ways for improving company cost-effectiveness, but possible examples of regulated activities include RD&D related to the operation of local transmission and distribution facilities, or anything specifically directed by the CPUC (e.g., low-emission vehicles).

3. Scope/Activity Emphasis For Regulated RD&D

Regulated RD&D will cover the full range of regulated energy services. Although uncertainty regarding regulated utility functions in the restructured environment persists, the WG anticipates that regulated RD&D activities will primarily address transmission and distribution functions. Continued investment by regulated entities in RD&D related to generation facilities still owned by those entities is an area on which the WG could not reach consensus.

Regulated RD&D activities are expected to focus on relatively short-term improvements in efficiency and cost-effectiveness of regulated utility operations that will lead to reduced rates and/or improved service for customers.

4. Stakeholders/Participants In Regulated RD&D

Regulated RD&D will continue to be conducted primarily by investor-owned and municipal utilities. RD&D activities may also involve other parties as collaborative participants, including technology developers and vendors, collaborative research organizations, universities and laboratories, and public agency research supporters.

5. Funding And Administration Of Regulated RD&D

Regulated RD&D will be funded through rates, with the level determined through a performance based ratemaking (PBR) proceeding. Under PBR, RD&D expenditures will be at the discretion of the regulated entity, subject to any constraints established by the CPUC through the PBR proceeding. The specific proceeding outcome -- level of funding and anticipated research activities --- is expected to differ for each California utility.

Regulated utility RD&D spending levels in the latter half of this decade are expected to decline from current overall RD&D authorization levels.³ This forecast reflects the narrower scope of

³ EPRI forecasts a 32 percent decline in all EPRI RD&D over the period 1995 to 2000, and GRI forecasts a 30 percent decline in all GRI RD&D over the same period.

activities addressed by regulated RD&D as well as an expectation that utilities will exercise restraint in all expenditures until their relative competitive position in the restructured environment is established. The WG expects this investment level to increase somewhat after the year 2000 as regulated entities develop an improved understanding of the energy services environment. Research activities will probably be more targeted to specific emerging cost or service issues.

6. Changes in Regulation or Legislation For Regulated RD&D

Current FERC and CPUC guidelines on RD&D, and Public Utilities Code Section 740.1 covering utility RD&D activities, are no longer appropriate. The WG recommends eliminating them altogether since, under performance-based ratemaking, the CPUC will be reviewing proposed RD&D spending at a highly aggregated level, rather than at a project-by-project level. Alternatively, the WG recommends that the FERC/CPUC definitions be amended and remain only as guidance. Suggested modifications to the FERC and CPUC definitions are included in Appendix II A and B.

D. PUBLIC INTEREST RESEARCH

"Funding for research related to the broader public good will be collected in the public goods charge." (D. 95-12-023, p. 29).

1. Proposed Definition Of Public Interest RD&D Activities

The main purpose for public interest RD&D activities is to provide benefits to the public which might not otherwise be adequately provided for by the private or regulated sectors. For our purposes the term "public" refers to California citizens.

Since all RD&D can be said to provide some public benefit, it is important to further qualify public interest RD&D to make sure that the anticipated benefits to California citizens are worth the investment. The WG specifically concluded that public interest RD&D funds should not be used to displace expenditures more appropriately carried out by regulated entities or competitive firms. Therefore, we propose the following definition for public interest RD&D activities:

Public-interest RD&D activities are directed toward developing science or technology, 1) the benefits of which accrue to California citizens and 2) that are not adequately addressed by competitive or regulated entities.

2. Examples Of Public Interest RD&D Activities

Public-interest RD&D activities range widely in scope and type, but should offer a reasonable expectation of benefits to California citizens. These benefits would include improved environmental quality, improved management of natural resources, protection of public health and safety, public information, and increased energy security. Competitive or regulated entities may

not always adequately provide these public interest benefits either because they cannot be sufficiently appropriated by the private sector, or because there are regulatory or economic barriers which cannot be overcome. These reasons are reflected and amplified in the subsection 3 below.

Specific topics for public interest RD&D activities include, but are not limited to, emerging renewable technologies, global climate change, environmental controls, clean-burning fuel, indoor air quality, heat islands, evaluation of non-market effects of private energy decisions, building diagnostics, and basic research likely to be relevant to energy services.

3. Scope/Activity Emphasis Of Public Interest RD&D

As indicated by the definition section above, public interest RD&D activities are primarily characterized by having a high value to a wide range of California citizens. There are other characteristics that can be used to recognize and prioritize public interest RD&D, many of which address market barriers. The following list contains the major types of concerns (including examples) for which public interest RD&D activities are appropriate:

- *External cost concerns:* global climate change or pollution problems;
- *Non-excludable value concerns:* when benefits of RD&D cannot be sufficiently captured (i.e. excluded from its competitors) by the institution investing in it;
- *High-risk research concerns:* when the chance of profitable success is too low or the pay-back time too high for the private sector to undertake;
- *Capital availability concerns:* when potential new technologies are sufficiently beyond the scope or capabilities of existing private institutions to fund;
- *Implementation concerns:* when there are market or regulatory barriers inhibiting the implementation of beneficial technology;
- *Technology information concerns:* when society needs to determine potential benefits and impacts of existing or emerging technologies; and
- *Public purpose concerns:* when a public body such as the CPUC or Legislature specifically requires public interest RD&D assistance.

4. Stakeholders/Participants In Public Interest RD&D

Public interest RD&D activities involve a broad range of stakeholders and participants. The list below is not exhaustive, but includes major stakeholder groups:

- *The Public:* ratepayers; taxpayers; residents
- *Public Interest Groups:* environmental ; scientific; ratepayer
- *State Agencies:* CEC; CPUC; UC; ; the State Resources Agency
- *Research Institutions:* EPRI; GRI; DOE; ASERTTI/CIEE; universities; LBL/LLNL
- *Distribution Companies:* Investor-owned and municipal utilities
- *Power Producers:* utility-owned generation: IPPs; renewable producers
- *Power Consumers:* manufacturers; industry; buildings

It is anticipated that these relevant stakeholders will provide significant input to RD&D decision makers, thus assuring an efficient and equitable use of public interest RD&D funds.

5. Funding And Administration Of Public Interest RD&D

Future funding for public interest RD&D should be provided from a public goods charge and is discussed in detail in Chapter III. Administration of these funds, including the prioritization of their use and the quality control mechanisms, should be implemented by a research organization (RO) established by the Legislature or CPUC. Governance and administration issues are discussed in Chapter IV.

6. Changes in Regulation or Legislation For Public Interest RD&D

Public interest RD&D will presumably require new legislation and may or may not be regulated by the CPUC in the restructured environment. Chapter V identifies areas where changes in regulation or legislation may be needed.

CHAPTER III: FUNDING OF PUBLIC INTEREST RD&D ACTIVITIES

A. OVERVIEW OF PUBLIC INTEREST FUNDING ISSUES

The primary purpose of this chapter is to provide information and recommendations about funding public interest RD&D efforts. We have already provided summary level information regarding our funding expectations for competitive and regulated RD&D activities in Sections B and C of Chapter II.

1. CPUC Direction/Guidance

D. 95-12-063 gave some specific guidance to the RD&D Working Group (WG), but the decision also provided the WG with substantial leeway in determining an appropriate level for the surcharge. The WG used the following citations as the starting point for developing its funding recommendations.

"The surcharge would be calculated to generate funding at current or historical levels, or legislatively adopted levels, for public goods research." (D. 95-12-063, p. 155);

"We reaffirm that the surcharge should collect funds for public goods research only, not funds for regulated or competitive research functions." (D. 95-12-063, p. 156);

"[T]he costs of utility LEV programs should continue to be collected by the regulated utility and identified as a line item on customer bills, as opposed to being collected as part of the PGC." (D. 95-12-063, p. 169); and

"We began this Rulemaking and Investigation by declaring our single minded dedication to discovering and deploying strategies and mechanisms which would place sustainable, downward pressure on the cost of electricity to all classes of California ratepayers." (D. 95-12-063, p. 4).

2. Working Group Approach

The WG members worked diligently to craft consensus on funding issues wherever possible, but due to the variety of member organizations' interests the WG was not able to agree on a single funding level for the RD&D surcharge. Instead the WG opted to present information about a variety of approaches for determining appropriate funding levels. Alternative options for funding public interest RD&D are summarized in Sections C and E of this chapter.

In addition, at least one party from the WG believes that it is premature to establish a specific funding level for RD&D programs without first considering the cumulative amount of dollars to be collected by the various surcharges for all public policy programs. This party believes that while it is important to designate the amount to be devoted to each program (energy efficiency, RD&D, low income, etc.) the funding level should be determined in a coordinated effort by looking at all the surcharges together.

B. APPROPRIATE FUNDING SCOPE FOR PUBLIC INTEREST RD&D

An important step for the WG in determining an appropriate public interest RD&D funding level was the task of clarifying the types of activities to be covered by the surcharge. Even though the WG members agreed that "bright-line" boundaries are not appropriate in the new paradigm, the WG found it necessary to identify broad categories of RD&D activities and determine whether to include or exclude those categories of RD&D from the surcharge calculations. Obviously activities within the selected technology categories would also be required to meet the definition of public interest RD&D to be eligible for funding by the public interest research organization (RO).⁴ For example, a specific type of energy efficiency or renewable technology RD&D activity would not be eligible for funding if that activity would otherwise be adequately conducted by competitive or regulated entities:

1. Activity Scope

a. Energy Efficiency, Renewable Technologies and Environmental Issues

The WG members agreed that surcharge funded public interest RD&D activities should focus primarily on energy efficiency, renewable technologies and environmental issues (e.g. natural resources, air quality, health and safety, etc.). The WG did not reach consensus about whether non-renewable advanced generation, or storage activities should be included in the funding level calculations. Therefore, some of the specific funding level options discussed later in Section E include funding for these type of activities, while other options do not.

b. Transportation

The CPUC has authorized utilities to retain responsibility for certain types of low emission vehicle (LEV) programs that are closely related to their regulated functions, such as RD&D related to the refueling infrastructure for electric or natural gas vehicles. These expenditures will continue to be included in regulated RD&D budgets.

The WG members recognize that some types of advanced transportation RD&D activities may not be conducted under the current CPUC guidelines, and although the WG agrees that these types of public interest transportation RD&D would be most appropriately linked directly to transportation consumers, it did not want to preclude the RO from making an exception in special cases. Nevertheless, no surcharge funds for transportation are contained in any of the options discussed in the remainder of this chapter. If the scope of regulated RD&D activities related to transportation decreases in the future, due to factors such as changes in CPUC or Legislative guidance, then it may be appropriate to re-examine the issue of funding public interest transportation RD&D through the public goods charge and the RO.

⁴ Governance and administration options for the public interest research organization (RO) are discussed in detail in Chapter IV.

c. Independent System Operator/Power Exchange

The WG did not include any funding for RD&D in direct support of Independent System Operator (ISO) or the Power Exchange (PX) operations in its surcharge level recommendations. RD&D efforts for those functions should be financed through the portion of the electricity system fees that fund the ISO and PX rather than through the public goods charge. The WG agreed that the RO should have the ability to administer RD&D funds on behalf of the ISO and PX, if necessary, but the WG anticipates that there will be other organizations that will be better suited to manage the types of research that will be needed for these functions.

d. Nuclear Decommissioning

The WG agreed that since nuclear decommissioning related RD&D activities are the responsibility of the Federal Government, they should not be funded or managed through the RO.

2. Commercialization Scope

The overall importance of connecting RD&D activities to the market through commercialization efforts is discussed in Chapter II of this report. The following discussion highlights the main difference between "limited-scale" and "larger-scale" commercialization activities. WG participants have differing views about what commercialization activities, if any, should be specifically financed with public interest RD&D surcharge funds, as reflected in the funding level options discussed in Section E of this chapter.

a. Limited-Scale Activities

The WG members agreed that the RO should focus on RD&D activities. However, the RD&D program wherever possible should be connected to the market, and therefore the RO should have the ability to undertake limited-scale public interest commercialization activities, primarily for technologies addressed by the RO's RD&D program. Examples of limited-scale commercialization activities might include identifying legal or regulatory barriers to new and improved technologies, and providing impartial information about new technologies.

b. Larger-Scale Activities

The WG members also agreed that some types of larger-scale and higher cost technology commercialization activities may not be adequately provided by competitive and regulated entities alone, but did not reach consensus regarding whether the public interest RD&D surcharge is an appropriate mechanism for funding such activities. The WG agreed that surcharge funding level options could include proposals for larger-scale public interest commercialization activities. Table 3.1 indicates whether, and at what level, the various options include funding for larger-scale commercialization activities.

C. APPROPRIATE FUNDING SOURCES FOR PUBLIC INTEREST RD&D

Most of the WG agreed that, without some level of public funding support, restructuring of the electric utility industry will lead to a reduction in statewide public interest RD&D benefits. To address this problem, and to be consistent with the principles for public interest RD&D described in Chapter I, most of the WG also agreed that the surcharge should be based on both electricity and natural gas retail consumption. However, one party believes that the surcharge should not include natural gas. A discussion of the reasons for and against having a public interest RD&D surcharge applied to natural gas consumption is included in Section F of this chapter.

Notwithstanding this difference, the WG reached a consensus that, if a surcharge is imposed on both electricity and natural gas consumption, then all retail consumers (e.g., retail customers of IOUs, municipal utilities, independent power producers and gas pipeline companies) should pay the public goods charge. Additionally, some parties believe that it would be beneficial for the CPUC to first determine how and from whom the CTC will be collected before attempting to resolve these issues for the PGC.

Several municipal utilities in the WG expressed support for a surcharge upon all retail consumers, including municipal utility customers, provided that municipal utilities have the option to manage the surcharge funds collected from their ratepayers, in lieu of the RO. This viewpoint is reflected in the utility administration option which is described in Chapter IV.

The WG agreed that the specific details concerning various surcharge collection and adjustment issues should be handled together with other restructuring funding issues, which are specified further in Section G of this chapter.

D. METHODS FOR DETERMINING THE APPROPRIATE FUNDING LEVEL FOR PUBLIC INTEREST RD&D ACTIVITIES

This section of Chapter III provides and assesses several methods for determining the appropriate size of the public goods charge to fund RD&D activities. The WG has explored two primary approaches for determining the appropriate funding level. The first, which we have labeled the "Social Investment Approach," seeks to determine the level of public interest RD&D funding at which resources are allocated efficiently to create a greater overall level of social benefits for Californians and provide lower overall energy costs to California consumers in the long-term.

Due to certain unavoidable limitations with the Social Investment Approach, the WG also explored a second approach that uses historical funding as a guideline for determining the appropriate funding level for public interest RD&D activities in the future. This maintains a consistent level of funding to help establish a degree of stability for projects that are already in progress and signal to RD&D collaborators that these types of projects will have reliable sources of funding in the future.

1. Social Investment Approach

The objective of the Social Investment Approach is to use economic analysis to find the level of public interest RD&D funding which maximizes net social benefits and minimizes energy costs in the long-term within the context of a new competitive market. Economic theory states that the optimal RD&D investment level is that at which marginal benefits equal marginal costs, but practical application of the economic theory is very difficult if not impossible.

One of the difficulties with the Social Investment Approach lies in the lack of accurate and complete information about the benefits and costs of public interest RD&D. While it may be possible to estimate the dollar value of benefits from a particular project (e.g., job creation or reduced health care costs from improved pollution controls), it would be virtually impossible to value all of the social costs and benefits of public interest RD&D programs in general. For this reason, various proxies were examined for their usefulness in indicating proper social investment levels for public interest RD&D. These included benefit/cost studies from historical ratepayer-funded research programs; recommendations from research regulators; comparisons with RD&D levels in other market categories; and comparisons with energy RD&D spending in other industrialized countries. These proxies provide evidence which suggests to some WG members that, from a social investment point of view, utilities could have increased their overall RD&D funding efforts beyond historical levels to the benefit of ratepayers. However, the proxies alone do not directly indicate what would be the appropriate public interest RD&D investment level in the restructured market. It is therefore necessary to make a number of important assumptions to bridge this information gap, and to make recommendations regarding public interest RD&D funding levels using this method.

Benefit/Cost Studies: There is little question that properly selected and managed ratepayer-funded RD&D activities yield high returns to California ratepayers. For instance, the weighted average benefit-to-cost ratio estimate for the RD&D programs proposed by SCE in its 1995 Test Year General Rate Case was 6.7 to 1.⁵ Each of the other IOUs has also presented similar evidence of high ratepayer-funded RD&D benefits for their own research activities.

RD&D efforts conducted by the Electric Power Research Institute (EPRI) have also provided high returns to California's ratepayers. A 1994 report by PG&E on the value of its ratepayer-funded membership in EPRI showed that over the 1986-1993 period the benefit-to-cost ratio for ratepayers was 6 to 1.⁶ When the anticipated benefits and costs for the period 1994-1998 were added to the 1986-1993 data, the resulting overall ratio was 5 to 1 for the 13 year period. An SCE study showed similar results.⁷

⁵ SCE. "1995 Test Year General Rate Case - Working Papers," SCE 13 - Research, Development and Demonstration, Volume 2, Chapters II and IV.

⁶ PG&E. "Study of the Benefits of Membership in the Electric Power Research Institute, 1986-1998." September 22, 1994.

⁷ Southern California Edison General Rate Case, A. 93-12-035, Exhibit 35, p 166.

The high-benefit/cost results indicate that, in general, utility research money has been well spent, but the high benefits also suggest to some that there were more potentially high-benefit projects that were not undertaken. It is widely acknowledged that certain market failures and regulatory barriers have historically discouraged utilities from undertaking certain types of RD&D activities, and the evidence from the cost/benefits studies seems to support that view.

RD&D Regulator Recommendations: A number of respected RD&D regulators have historically called for higher levels of funding for utility RD&D. For instance, in 1992 the National Association of Regulatory Utility Commissioners (NARUC) adopted a resolution urging utilities to increase support of RD&D to achieve the goal of 1 % of gross operating revenues (GOR) nationwide, although very few commissions have adopted and even fewer have enforced the NARUC recommendation.⁸ Prior to the onset of utility restructuring, the New York State Public Service Commission repeatedly urged New York utilities to increase funding towards 1 % or more of GOR.⁹ The board of the Sacramento Municipal Utility District has adopted an investment standard for RD&D of at least 1 % of its GOR and SMUD has consistently met this standard during each of the past 4 years.

Comparison With Other Industries: The RD&D funding level difference between California utilities and other non-utility industries may exist for a number of reasons, and this should be taken into account in considering the following information. Historical utility RD&D spending of 0.4 % to 0.6 % of GOR falls far short of the 3.5 % average for RD&D spending in the United States across all industries. By comparison, in 1994 the telecommunications industry spent about 3.3 %, the electrical and electronics industry as a whole spent 5.7 %, and the health care industry spent 9.8 % of GOR on RD&D. Historical utility RD&D spending has even been lower than other low RD&D industries such as the paper and forest products industry at 1.0 % and the metals and mining industry at 0.7 % of GOR.¹⁰

Comparison With Other Nations: Comparisons of RD&D funding between California utilities and utilities in other countries should be interpreted cautiously. Every country has its own unique regulatory structure, system resources and customer needs. In addition, the RD&D reporting requirements for utilities in other countries may include activities that are outside the scope of California utility RD&D reporting. Nevertheless, it appears that utilities in a number of developed countries invest a greater portion of their GOR on RD&D activities than do California's utilities. For example, in Europe, French utilities spend 1.8 % of GOR¹¹ and Dutch utilities spend 2.7 % of

⁸ NARUC Resolution No. 32-1992.

⁹ This information is also based upon a June 28, 1996 telephone conversation between Joyce McLaren of the CEC and Janet Joseph of NYSERDA. The historical figures on New York RD&D policy come from a paper by Dr. David P. Stricos entitled, "Role of Public Utility Commissions in Promoting Application of Research and Development Results: A New York View." March 10, 1981.

¹⁰ Business Week. "Blue-Sky Research Comes Down To Earth," July 3, 1995.

¹¹ Report from Electricite de France, R&D Division, Paris, France, (Messrs. Jean Olive and M. Ballay, August 21, 1996).

GOR;¹² Japan's investor-owned utilities spend 1.3 % of GOR,¹³ and Mexico's utility system spends 1 % of GOR on RD&D activities.¹⁴

Although these proxies suggest to some WG members that, historically, electric and gas utilities could have increased their RD&D efforts to the benefit of ratepayers, none of the proxies provide a definitive answer to the question of what the appropriate overall level of investment in utility-related RD&D should have been, or what it should be in the future. Nor do these proxies indicate how overall RD&D funding by utilities should be allocated between competitive, regulated and public interest RD&D efforts in the future.

In order to overcome these limitations, supporters of the Social Investment Approach made two key assumptions. The first assumption is that, based on the evidence from the proxies, a total utility-related RD&D investment level of 1 % of gross operating revenues would be a more appropriate funding level than historical utility-related RD&D funding levels of 0.4 % to 0.6 % of gross operating revenues. The second assumption is that public interest RD&D investment should be raised by the same ratio that would be necessary to bring overall utility-related RD&D investment to 1 % of gross operating revenues. Additional information about the Social Investment Approach is provided in Section E of this chapter and in Appendix III B.

2. Historical Approach

The Historical Approach to funding is based upon actual or projected utility-related funding for RD&D projects in the years prior to and after the onset of restructuring.¹⁵ The rationale behind this approach is that the public goods charge should be used to return public interest RD&D funding to historical levels and prevent any further decline in public interest RD&D funding. Although restructuring is not fully implemented, anticipation of its impacts has already produced changes in some utility RD&D program planning and funding. The historical methods attempt to account for those changes that have already occurred, as well as those that are likely to occur over the next several years.

The number of possible variations for applying the Historical Approach is virtually unlimited, but three techniques were selected: the "Project-by-Project" method, the "Gap" method, and the "Weighting" method, as described below.

¹² Report from KEMA, Arhem, the Netherlands, (Dr. J. van Lierre, August 21, 1996).

¹³ Federation of Electric Power Companies and Central Electric Power Council, "Electricity Research and Development Plan," Tokyo, Japan 1996. For GOR, see: Japan's Electric Power Information Center, Inc., *Statistical Handbook 1995-1996*, Tokyo, Japan 1996.

¹⁴ Report from the EPRI, (Marvin Lieberman, August 19, 1996).

¹⁵ An investigation of annual utility spending totals between the years 1991-1996 revealed that California IOU spending was fairly stable until the year 1994, after which RD&D funding levels began to decline throughout the state. The WG did not use data from years prior to 1991 in its analyses because the utilities did not use a standardized RD&D reporting format until that year. Use of data from earlier years will not significantly change the results of the analyses because total utility RD&D spending during the years 1987 - 1990 was only slightly lower than was spending during the baseline period.

a. The Project-by-Project Method

The first method for implementing the Historical Approach is the Project-by-Project method. This approach examines each of the IOU programs on a project-by-project basis and was the most detailed of the three methods. Due to the complexity of this method, supporters of this approach applied it for only a single base year, as opposed to the other historical methods which use multiple years to estimate the historical baseline. The criteria for determining whether projects would be classified as public interest, competitive or regulated were essentially the criteria described in the WG's boundary definitions.

The first requirement of the WG's public interest RD&D definition is that the project must be expected to provide benefits to Californians. The second requirement of the public interest RD&D definition is that the project will not be adequately addressed by competitive or regulated activities. Members of the WG supporting the Project-by-Project approach examined every RD&D project from the four major California IOUs for a selected base year to determine whether projects from that year would be expected to provide societal benefits and then whether those projects would face market barriers that would discourage competitive or regulated entities from funding them in a restructured market. The total level of funding for projects identified as public interest RD&D was used as the foundation for determining the appropriate public goods charge.

More detailed descriptions of two Project-by-Project funding level approaches are included in Section E and summarized in Table 3.1.

b. The Gap Method

The second Historical Approach option, the Gap method, is based on the assumption that the projects which began dropping from utility RD&D agendas after a selected historical baseline period were those projects which will not provide significant returns in the regulated market and may thus be considered public interest RD&D activities. Therefore, the level of funding to be raised by the surcharge using this method was determined by figuring the absolute difference between a selected historical baseline and present or expected utility RD&D funding.

Although the Gap method is compelling in its simplicity, it has a number of weaknesses. For instance, factors other than restructuring have contributed somewhat to the decline in utility RD&D funding and some of the projects dropped were not public interest projects as defined in the boundaries chapter of this report. A portion of the funding decline occurred for other reasons, such as shifts in utility priorities or changes in CPUC guidance.

None of the WG members advocated the use of the Gap method in its simplest form, but some members supported the use of a Hybrid method that incorporated data from both the Gap method and the Project-by-Project method. A description of the Hybrid method recommendations is included in Section E and summarized in Table 3.1.

c. The Weighting Method

The third Historical Approach, the Weighting method, looks at broad categories of RD&D programs and estimates the decline in public interest RD&D funding expected to result from the market paradigm shift. The Weighting method works from the assumption that all utility RD&D projects that provide primarily public benefits and few competitive or regulated benefits will eventually be dropped. The method uses weights, or rules of thumb, to estimate the percentage of public interest projects that have historically been funded in broad categories of RD&D.¹⁶ The average of the results from each of the baseline years yields the funding which should be raised through the public goods charge according to this analysis.

As the WG members developed their positions on the surcharge determination approaches, it became apparent that none of the organizations favored the Weighting method, and the WG did not use it for any of the specific funding level recommendations contained in Section E of this chapter.

d. Adjustments to Historical Methods

For each of the Historical method calculations, it was necessary to adjust the funding levels to account for activities that the WG as a whole, or members of the WG, believe should be added to or removed from the scope of public goods charge. For instance, the WG did not include funding for transportation RD&D activities in the calculations for the reasons described earlier in this chapter. The WG did not reach consensus about adjustments to the surcharge to fund larger-scale, public interest commercialization activities. Therefore, some of the options include proposed levels or ranges of funding that may be appropriate to support such activities, while other options do not include funding for commercialization activities. Historical calculations for generation related activities were also adjusted based on WG member views about the extent to which renewable and/or advanced non-renewable generation research should be considered public interest RD&D. The specific adjustments used for each historical calculation method are explained further in Section E and summarized in Table 3.1.

Due to inconsistencies in the manner in which other organizations reported their RD&D information, the Project-by-Project and Weighting method analyses could not be completed for the municipal utilities and the California portion of utility funded research at GRI, EPRI and CIEE in the same fashion as the analyses were performed for the IOUs. The funding level recommendations provided in Section E include adjustments to account for these activities.

The deregulation paradigm shift has affected not only utility RD&D programs, but also public interest energy RD&D across the state and the country. None of the recommendations include

¹⁶ Some preliminary estimates were made using the RD&D activities reported in P.U. Code 740.1 categories, but the method could also be applied using utility RD&D categories such as generation, transmission and distribution, and end-use; or short-term, intermediate and long-term. The only requirement would be that the information be consistently reported by all utilities.

adjustments for non-utility funding declines, but information about changes in non-utility RD&D funding is included in Appendix III A.

E. RECOMMENDED FUNDING LEVELS FOR PUBLIC INTEREST RD&D

1. Specific Funding Level Calculations

a. Social Investment Approach

Rationale: The rationale for the Social Investment Approach funding estimates shown in Table 3.1 is that California should invest in a level of public interest RD&D that will provide a more optimal level of societal benefits, as well as lower long-term energy costs. Supporters of this approach believe that utility investment levels for RD&D activities in general, and public interest RD&D activities in particular, have historically been far too low.

Activity Scope: This proposal concurs with the consensus arrived at by the WG that the RO should focus on three areas: energy efficiency, renewable technologies, and environmental issues; funding for LEV programs should continue to be collected by the regulated utility outside of the PGC, in accordance with the CPUC directive; and funding for the ISO/PX and nuclear decommissioning research not be included in the PGC RD&D funding.

Commercialization Scope: Limited-scale commercialization activities would focus on overcoming information and regulatory barriers that keep otherwise viable technologies from gaining entry into the market. Such activities could include providing consumer and investor education and suggesting modifications to regulations which are unnecessarily impeding the adoption of public interest technologies. Larger-scale commercialization activities would focus on bringing emerging renewables and energy efficiency technologies down the production cost curve.

Funding Methodology: This proposal is based on the Social Investment Approach described in Section D.1 of this chapter. Based on several proxies, including recommendations by NARUC and the New York Public Service Commission, as well as comparisons with Western Europe and Japan, this proposal asserts that a total RD&D investment of 1 % of gross operating revenues would be closer to a social optimum than current or historical investment levels. This public interest percentage of total historical RD&D budgets is determined using both the Gap method and Project-by-Project method to evaluate project loss since the advent of restructuring. This results in a public interest percentage of historical utility RD&D investments in the range of 60 %-68 % (See Appendix III B). This historical public interest RD&D percentage is multiplied by 1 % of utility operating revenues to arrive at the proposed level of public interest RD&D funding.

Funding Level: The Social Investment Approach results in a funding level of approximately \$165 million per year. Commercialization of emerging technologies would add about \$60 million dollars per year to this figure.

Duration: A publicly accountable body would periodically review the funding level and would adjust as necessary.

b. Traditional Scope Level: (Project-by-Project Method #1)

Rationale: The rationale for the Project-by-Project estimates shown in Table 3.1 is that California should invest in the levels of public interest RD&D funding that have historically been included in utility rates. The Project-by-Project method attempts to show the level of public interest funding that has historically been embedded in utility rates.

Activity Scope: This proposal concurs with the consensus arrived at by the WG that the RO should focus on three areas: energy efficiency, renewable technologies, and environmental issues; funding for LEV programs should continue to be collected by the regulated utility outside of the PGC, in accordance with the CPUC directive; and funding for the ISO/PX and nuclear decommissioning research not be included in the PGC RD&D funding. This proposal also includes funding for some advanced non-renewable generation and storage RD&D activities expected to face significant market barriers in the regulated and competitive sectors.

Commercialization Scope: Limited-scale commercialization activities would focus on overcoming information and regulatory barriers that keep otherwise viable technologies from gaining entry into the market. Such activities could include providing consumer and investor education and suggesting modifications to regulations which are unnecessarily impeding the adoption of public interest technologies. Larger-scale commercialization activities would focus on bringing emerging renewables and energy efficiency technologies down the production cost curve.

Funding Methodology: This proposal is based on the Project-by-Project approach described in Section D.2 of this chapter. (See Appendix III C).

Funding Level: This estimation approach results in a RD&D funding level estimate of approximately \$75 million per year, plus an additional \$50 million per year if large-scale commercialization activities are also to be funded through the RD&D surcharge.

Duration: A publicly accountable body would periodically review the funding level and would adjust as necessary.

c. Narrow Scope Level: (Project-by-Project Method #2)

Rationale: This surcharge option strikes a balance between the narrower interpretation of public interest RD&D in the Hybrid option and the inclusive interpretation of public interest RD&D in the Project-by-Project #1 option. It provides for a comprehensive research approach in research activity focus areas, but limits the number of focus areas to those specifically called out in the WG public interest RD&D definition.

Activity Scope: RD&D projects will focus on energy efficiency, renewable technologies, and environmental issues such as natural resource management, public health and safety, air quality,

and terrestrial and aquatic impacts of energy generation and transmission. A full range of R&D activities will be pursued, including technology scanning, technology assessments, technology development and limited scale technology demonstrations.

Commercialization Scope: The surcharge would include funding for smaller-scale commercialization activities addressing market, regulatory and information barriers affecting adoption of the technologies or processes resulting from RD&D activities conducted using surcharge funds. These activities would include targeted information dissemination to address barriers to market entry of new technologies and processes. Surcharge support of these activities should cease when private market entities have demonstrated the ability to support and conduct them.

Potential equipment manufacturers will be contacted for further development of any RD&D product that appears to have near term potential application in the energy sector. Prototypes of commercial products may be funded out of surcharge funds for these products, if necessary to obtain manufacturer or vendor commitments. For products and research results without near-term commercial application, no commercialization activities will be pursued with surcharge funds.

Funding Methodology: This funding level is based on the Project-by-Project Assessment method analysis, with all conventional generation (fossil, hydro, geothermal) and storage projects eliminated from the public interest category. (See Appendix III D).

Funding Level: Approximately \$40 million (excluding contributions to outside research organizations such as EPRI which are viewed as regulated activities). This level would increase by \$25 million if larger-scale renewables demonstrations are to be funded with this surcharge.

Duration: Surcharge scope and level would be reviewed every five years to determine whether there is a continuing need for a public interest RD&D surcharge, and whether scope and level changes are required. Mechanisms for this review are outlined in Chapter IV.

d. Limited Funding Level: (Hybrid Approach)

Rationale: The underlying principle for this approach is that the sole purpose of the surcharge is to address the decrease in public interest research that might result from restructuring. It is not meant to redress any past CPUC decisions especially related to generation research. This option takes the most narrow interpretation of the WG's definition of public interest RD&D.

Activity Scope: RD&D projects will focus on the areas of energy efficiency, renewable technologies, and environmental issues. No projects that would be done by the regulated utility should be covered by the surcharge; those regulated areas include research related to the wires company, such as EMF, safety, and environmental research associated with transmission and distribution. Transportation related issues will also continue to be addressed in the regulated arena. Areas that should be picked up by the competitive market such as research related to generation will not be covered by the surcharge. In addition, the PGC is not meant to develop

emerging technologies such as non-customer-sited photovoltaics, or any renewable technology where there is competitive market interest in the technology.

Commercialization Scope: The scope of public interest commercialization activities would be limited to information dissemination only. No funds would be provided for larger-scale public interest commercialization activities.

Funding Methodology: This estimate represents a hybrid historical approach based on the rationale and activity scope stated above. A pre-PBR base year was selected for each regulated utility. Then a case by case analysis was done to determine which projects have been dropped in subsequent years and which are forecasted to be dropped in the near future due to restructuring. Expert judgment was used to determine how much of the funding level decrease should be attributed to public interest. (See Appendix III E).

Funding Level: This method results in a funding level estimate of approximately \$20 million.

Duration: The public interest surcharge should be eliminated when the following conditions exist:

- 1) Full direct access is implemented;
- 2) All retail service is divested from wires company; and
- 3) All generation, including ancillary services divested from wires company.

TABLE 3.1
SUMMARY OF SURCHARGE FUNDING OPTIONS

Surcharge Description	Social Investment Level	Traditional Scope Level	Narrow Scope Level	Limited Funding Level
Activity Scope	Focus on energy efficiency, renewables and environmental issues.	Focus on energy efficiency, renewables and environmental issues, as well as some advanced non-renewable generation and storage.	Focus on energy efficiency, renewables and environmental issues.	Focus predominantly on energy efficiency, but also include customer-sited renewables and some environmental issues.
Funding Methodology	Scale RD&D to 1 % of GOR	Project-by-Project	Project-by-Project	Hybrid
Limited-Scale Commercialization Scope	Identify regulatory barriers; facilitate collaboratives; provide impartial information to investors and consumers.	Identify regulatory barriers; facilitate collaboratives; provide impartial information to investors and consumers.	Provide targeted information regarding surcharge-funded RD&D results to develop products with near-term potential application.	Provide limited information only.
Larger-Scale Commercialization Scope	Provide funding to bring new technologies down the cost curve.	Provide funding to fill the public interest commercialization gaps in other public policy programs.	Provide funding for large-scale renewable demonstrations, if not covered elsewhere.	None
Funding Level Estimates				
A. Base Level (electric, gas, munis, limited-scale commercialization)	\$165 million	\$75 million	\$40 million (includes research contributions)	\$20 million
B. Larger-scale Commercialization	\$60 million	\$50 million (if necessary)	\$25 million (if necessary)	\$0
C. Total Funding Level (A + B)	\$225 million (total)	\$125 million (total)	\$65 million (total)	\$20 million (total)
Duration	Review and adjust as necessary.	Review and adjust as necessary.	Review every 5 years for adjustment or possible discontinuation, if appropriate.	Discontinue when: 1) Full direct access; 2) All retail service divested from wires company; 3) All generation, including ancillary services divested from wires company.

2. Pros and Cons of Specific Funding Level Options

"Pros and cons" for each funding level option proposed by members of the WG are reflected below. The WG did not attempt to reach consensus on these "pros and cons," and there is no consensus on which funding level is best. Therefore, parties agreed to address their preferences in comments to the CPUC after this report is filed.

a. Social Investment Level

Pros: Supporters of this method believe that it has a number of important advantages over any of the Historical Approach funding recommendations. Most importantly, it recognizes that there have been a number of barriers to utility investment in RD&D and it attempts to find a more optimal RD&D investment level. Bringing RD&D investment to a higher level would provide real economic benefits to California energy consumers through more efficient, less expensive and cleaner technologies. Although the funding level estimate from the Social Investment Approach is higher than the other funding estimates, the cost is quite low on an absolute basis and is more than offset by the benefits this approach is expected to provide.

Cons: One of the disadvantages of this method is that it may underestimate the level of public interest spillover benefits from competitive and regulated RD&D after restructuring is implemented. Competition in other restructured industries, such as telecommunications, has resulted in an increase in some types of RD&D activities by the competitive sector and it is likely that this will occur in the electricity industry as well. A second disadvantage of this method is that it would require a near-term increase in ratepayer RD&D funding. Even though an increase in ratepayer RD&D funding should increase social benefits and lower ratepayer long-term energy costs, any increase in near-term costs from current levels may be unacceptable to some parties at this time.

b. Traditional Scope Level: (Project-by-Project Method #1)

Pros: One advantage of this funding level estimation method is that it uses the WG definition of public interest RD&D to review specific historical utility RD&D activities. This level of detail makes the analysis quite transparent so that other parties could use the estimation worksheets to develop their own list of public interest RD&D projects.

Cons: This funding estimation method assumes, as do all of the historical estimates, that ratepayers funded an appropriate level of public interest RD&D in the years prior to the onset of restructuring.

c. Narrow Scope Level: (Project by Project Method #2)

Pros: The specific focus areas described in the activity and commercialization scope provide clear direction for surcharge administration. This method provides adequate resources to address a full range of RD&D activities in the focus areas.

Cons: This funding level may result in rate increase, especially at the higher end of the funding range, because it will increase RD&D funding from current levels towards levels that ratepayers funded prior to restructuring.

d. Limited Funding Level: (Hybrid Approach)

Pros: This method seeks to address the underlying objective of restructuring -- to reduce overall energy costs for all Californians. Because of the significantly reduced RD&D budget proposed by this method, the bureaucracy associated with administering this fund could be much smaller than the other RD&D funding proposals.

Cons: This method seeks to minimize near-term ratepayer contributions to public interest RD&D activities, which in the longer-term may result in a lower level of social benefits and higher energy costs. This method also assumes that the historical public interest RD&D funding levels were appropriate and will be appropriate in the restructured marketplace.

3. Duration Of The Public Goods Surcharge For RD&D

Some of the WG members believe that the public interest RD&D issue is of a long-term or permanent nature. Therefore, they believe that the public goods surcharge for RD&D should also be long-term or permanent in nature, subject to periodic review by a publicly accountable body. They cite three factors which justify the need for an ongoing surcharge for public interest RD&D, as opposed to a surcharge during a transition period only.

First, the WG members in support of a longer-term public interest RD&D surcharge believe that competitive and regulated RD&D will not adequately provide all types of societal benefits. For instance, they believe that profit seeking entities are unlikely to provide some types of environmental, or health and safety research, even after the market becomes fully competitive. Next, these WG members believe that profit seeking entities will be unable to overcome certain types of barriers to new technologies or products, even after the transition period. As evidence they cite the large body of economic research which indicates that competitive industries generally under-fund high cost, high risk, or long-term RD&D, even though those types of activities generally provide the highest societal returns. Lastly, they believe that California should avoid the waste and opportunity cost of discontinuing promising public interest RD&D projects before their completion, which in some instances will be longer than the three to five year transition period.

Other WG members believe that the reduction in RD&D-related benefits will primarily occur during the transition to full direct access. These parties have observed that many competitive industries invest large sums in long-term RD&D activities. Thus, it is their view that restructuring of the utility industry to promote competition and improve consumer choice will not necessarily harm long-term RD&D efforts. Rather, market forces will prescribe the funding for RD&D which will be directed to those areas that competition and customers prefer. Long-term RD&D will continue as market forces dictate. Public interest RD&D could be funded to the extent that there are spillover benefits from RD&D in the competitive and regulated sectors.

F. FUNDING IMPACTS ON NATURAL GAS PROGRAMS

The issue of whether to include natural gas customers in the public interest RD&D surcharge was extensively debated by the WG members. Most members of the WG concluded that the surcharge should apply to both electricity and natural gas customers in order to satisfy the "guiding principles" contained in Chapter I of this report. However, one member of the working group strongly asserted that these guiding principles can best be satisfied if the surcharge does not apply to natural gas customers. The principles provide, among other things, that: (1) public interest RD&D activities should be funded and administered in an equitable manner which insures that the beneficiaries of these activities contribute fairly to the funding, and that those who fund these efforts receive a fair share of the benefits (i.e., "free-ridership" and cross-subsidies should be minimized or avoided); and (2) public interest RD&D activities should be funded and administered in a manner which avoids or minimizes unfair competition, and promotes a competitive "level playing field."

WG members who supported a combined electricity and natural gas surcharge did so, in part, because they felt that it would be necessary to ensure a "level playing field" between electricity and natural gas competitors in a restructured market. To these members, it is unfair to impose a surcharge on electricity sales without doing the same for natural gas sales. In addition, proponents of the combined electricity and natural gas surcharge noted that many types of public interest RD&D activities would provide benefits to both electric and natural gas suppliers and/or their customers, so a combined surcharge would be necessary to avoid "free-ridership" by natural gas customers. The WG did not determine the extent of these overlapping benefits, but examples would include RD&D activities pertaining to environmental or long-term improvements in gas-fired generation; and many end-use efficiency products, such as insulation, ducting, or windows, which reduce heating and cooling loads for both natural gas and electricity customers. Proponents of the combined surcharge felt that it would be both inefficient and impractical to limit public interest RD&D activities to electricity projects only, and it would discourage the kind of useful collaborative efforts which the WG otherwise supports.

The WG member who opposed the combined surcharge did so for the following reasons. First, this member asserted that although the natural gas industry has already been significantly deregulated, it has not reduced its funding for public interest RD&D activities. Therefore, from this member's perspective, concerns about public interest RD&D funding should focus on the electricity industry, where a funding problem may exist, not on the gas industry, where a funding problem does not exist. Second, this member contended that if there is any reduced spending on public interest RD&D activities, it may reflect improved efficiency in the management of available funds, rather than a reduction in public interest benefits. If this is so, natural gas customers should not be penalized because gas utility managers have improved the efficiency of their RD&D programs. Third, this member notes that since virtually all Californians now use electricity, an electricity-only RD&D surcharge would provide equitable benefits to those who are paying for it. Finally, this member pointed out that if the natural gas industry is required to shoulder some of the total public interest RD&D program costs, this will simply shift these costs from electricity bills to gas bills and thereby "unlevel" the competitive playing field which now exists between the gas and electricity industry.

As noted earlier, the WG did not reach consensus on whether to extend the surcharge to natural gas customers, but members did agree that if the surcharge is imposed on both electricity and natural gas consumption, then all retail customers (e.g., retail customers of IOUs, municipal utilities, independent power producers and gas pipeline companies) should pay the public goods charge.

G. OTHER FUNDING ISSUES

The WG members recognize that the manner in which the public goods charge for RD&D will be collected and reviewed must be addressed with other surcharge funded public policy programs, and perhaps with the competitive transition charge as well. The WG identified a number of these issues related to funding public interest RD&D through the surcharge, as follows:

1. Issues Concerning Collection of the Public Goods Charge

- (a) Should surcharge be calculated on the basis of energy (kWh or Therms) or percent of operating revenues, or some other method such as a flat fee?
- (b) Who should collect the RD&D funds (e.g., utilities, others)?
- (c) How should self-generator surcharge fees be collected, if at all?
- (d) How do we prevent double counting?
- (e) Should there be any exclusions from the surcharge (e.g., low income customers)?

2. Issues Concerning Adjustment and Review of the Public Goods Charge

- (a) What mechanism should be used to adjust for inflation (e.g., use percent of revenues, adjust according to the CPI or PPI or some other measure)?
- (b) How often should the surcharge be reviewed to determine if it should be adjusted upwards, downwards or eliminated?
- (c) Should the surcharge be permanent or should it sunset after the transition period?

The WG decided not to recommend positions on these issues at this time, but to urge their consideration in the implementation efforts which will follow this RD&D report.

CHAPTER IV: ADMINISTRATION OF PUBLIC INTEREST RD&D FUNDS

A. OVERVIEW OF RD&D ADMINISTRATIVE ISSUES

1. CPUC Direction/Guidance

The key guidance from D.95-12-063 (p.157) concerning the governance and administration of public interest RD&D funds is the statement that, "After a transition period, perhaps by January 1, 1998, the funds collected through a surcharge for public goods research should be administered by an independent non-utility entity." The CPUC did not provide guidance on whether the independent non-utility entity should be a new or existing state agency, a non-profit corporation, or some other type of organization.

2. Working Group Approach

This chapter begins with a discussion of the goals, functions, and performance criteria for the research organization (RO). On these issues there was a consensus among the parties participating in the WG. We then describe three major organizational options, and several sub-options, for the RO. Finally, "pros and cons" for each of these options proposed by members of the WG are included in Section D of this chapter. However, the WG did not attempt to reach consensus on these "pros and cons," and there is no consensus on which of the major organizational options is best. Therefore, parties agreed to address their preferences in comments to CPUC after this report is filed.

B. GOALS, FUNCTIONS AND PERFORMANCE CRITERIA FOR THE RESEARCH ORGANIZATION

Prior to identifying and evaluating various structural options for governing and administering the public interest RD&D funds, the WG agreed that it was important to reach consensus on the overall goals, functions and performance criteria for the RO. The goals, functions and performance criteria which the WG agreed to are set forth below.

1. Goals of the Research Organization

a. Serve the broad public interest

The RO must focus on RD&D activities which serve the interests of all Californians in areas not adequately addressed by competitive or regulated research entities. The RO should select technically superior RD&D activities that represent a credible effort to achieve positive public benefits. It should also avoid selecting activities for non-scientific purposes. The RO's decision making processes should be structured to avoid financial conflicts of interest.

b. Support state energy policies

The Governor and the Legislature currently evaluate California's energy policies every two years, as part of the California Energy Commission's (CEC) Biennial Energy Report review process. The RO must develop and implement a research program which is consistent with and supportive of these state energy policies, while maintaining an appropriate balance among research projects addressing the recommended surcharge focus --i.e. energy efficiency, renewable technologies and environmental issues.

c. Address the needs of consumers

The RO must ensure that its RD&D program addresses the needs of all energy consumers who contribute to the surcharge, and that its research activities reflect changing energy technology and market situations. This does not mean that all research should have a potential near-term commercial market, but that the changing needs of the marketplace and consumers should be taken into account in the RO's decision making process. With regard to energy efficiency and renewables, the RO should consider the RD&D needs of activities funded by the Energy Efficiency public goods charge and the Renewables portfolio standard or surcharge.

2. Functions of the Research Organization

The WG agreed that the primary functions of the RO should include: (1) implementation of state RD&D policies; (2) program planning; (3) implementation of RD&D activities; and (4) program administration. The subsections below briefly describe each of these four functions. Section C of this chapter will specifically describe where and how these functions would be carried out within the structural options being discussed.

a. Policy making

The WG agreed that the RO must carry out its various functions in a manner which is consistent with state energy policies. In addition, the RO will have and seek information and expert advice regarding public interest RD&D activities and needs in California. This information will allow the RO to make educated policy-level decisions concerning its own RD&D programs, and will also enable the RO to provide useful policy-level input to the Legislature and others.

b. Program planning

The RO will need a plan for implementing its research program. This plan could result from either internal RO work which builds upon stakeholder and/or advisory committee input, or from a plan developed externally. The RO will also need to undertake some limited energy technology assessment activities (e.g., obtaining baseline costs and performance data) for plan evaluation purposes.

c. Implementing RD&D activities

The RO must ensure that its RD&D plan is effectively and efficiently implemented. The RO will implement the RD&D activities in its plan primarily by contracting out this work to qualified individuals and/or companies. However, the WG does not intend to exclude the RO from participation in technology assessment and planning activities, or from personnel exchanges which would enhance the RO's internal RD&D capabilities.

d. Program administration

The RO must administer and manage the ongoing RD&D activities in its RD&D program. Administrative activities would include review and evaluation of program results, actions needed to maximize the productivity of RD&D contractors, and periodic progress reports to appropriate public oversight entities.

3. Performance Criteria For The Research Organization

The WG agreed that the RO's performance should be evaluated based upon the following performance criteria:

a. Open and flexible planning process

The RO is expected to use a planning process which ensures the active participation of a broad spectrum of stakeholders in public interest RD&D. A process that encourages such participation, and whose outcome reflects this input, will provide the RO with information to confirm that the research program is addressing the public interest.

b. Effective and efficient program implementation

The RO must have expertise in: (a) planning and managing public interest energy RD&D programs; (b) balancing various RD&D activities (e.g. near-term and longer-term, renewables, efficiency, environmental, and customer classes); (c) effectively using stakeholders and expert advisory groups in the program planning and evaluation process; (d) implementing streamlined contract procedures and management methods; and (e) keeping overhead and administrative costs low.

c. Maintain public accountability

The RO must maintain accountability to the citizens of California. The RO should establish a tracking and review system for its RD&D contracts, and make periodic reports to the public regarding the efficiency and effectiveness of its programs. The RO should also be subject to oversight review by a publicly accountable independent entity to assure that its programs are consistent with state policies and are using funds in an efficient and effective manner.

d. Collaborate and Enhance California's RD&D Infrastructure

In order to effectively leverage available surcharge funds, the RO is expected to encourage collaboration among both public and private RD&D entities. Since the success of California's energy RD&D efforts will depend on a reservoir of talent in both the for-profit and non-profit sectors, and since the WG anticipates a continuing need for RD&D on energy efficiency, renewable technologies and environmental issues, the RO's strategy should include measures that maintain and strengthen the RD&D infrastructure.

C. ADMINISTRATIVE OPTIONS FOR THE RESEARCH ORGANIZATION

The WG considered a number of organizational structures for the RO, and concluded that there are three major options for the governance and administration of the RO, as follows: (1) an integrated, multi-purpose entity; (2) an independent, single-purpose institution; or (3) a utility administrator. The key distinguishing features of these three options are the relationship of public interest RD&D programs to statewide energy policy; the relationship of public interest RD&D programs to other public interest energy programs; the level of activities conducted by the RO itself, and the degree of statewide or local administration of the funds.

The integrated, multi-purpose option differs from the other options in that statewide energy policy and various public purpose programs, including RD&D, would be carried out within a single unified organization. The independent, single-purpose option places RD&D responsibilities into a separate, single-purpose RD&D organization that would not be responsible for creating statewide energy policy. The utility administrator option allows utilities to manage public interest RD&D programs, subject to review by a statewide oversight board. These three options can be implemented in various ways, or in combinations, as discussed below, and summarized in Table 4.1 at the end of this chapter.

1. The Integrated, Multi-Purpose Administrator Option

The integrated, multi-purpose administrator option consists of a state energy policy making board, executive officer and expert staff all employed within one unified statewide organization. This integrated organization would also administer a number of public purpose energy activities in addition to the RD&D program (e.g., public interest energy efficiency programs, etc.).

The integrated, multi-purpose administrator option would be governed by a small, legislatively-approved board or commission, whose members have expertise in specific areas such as energy and the environment, engineering and technology, public interest economics, etc. The governing board could consist of either an existing state entity (e.g. the CEC), a joint powers authority (JPA) whose members are derived from several existing governing entities (e.g., the CPUC, the CEC, the municipal utilities),¹⁷ or a newly created state entity. Alternatively, the integrated option

¹⁷ Entities participating in a JPA can delegate some or all of their existing authorities to the JPA, subject to Legislative approval.

could be assigned to an existing Executive Branch agency directly responsible to the Governor (e.g. the Resources Agency).

The integrated, multi-purpose administrator option relies on an executive officer and expert staff to directly assist the governing authority in carrying out its various public interest energy responsibilities. These responsibilities would include the following:

a. Policy making functions - In the integrated RO option the governing authority would develop statewide energy policies (including policies related to RD&D) with expert input from its staff, stakeholders, technical advisory committees, and the public.

b. Program planning functions - In the integrated RO option the executive officer and staff would develop an RD&D program plan, and the governing authority would then publicly review and approve it. After approval, the staff would implement the plan consistent with state energy policy. The plan may include technology assessment activities.

c. RD&D implementation functions - In the integrated RO option the staff of the governing authority would implement most of the RD&D activities by contracting out this work to qualified individuals, institutions and/or companies. "In-house" RD&D activities would only be performed in those limited circumstances where the governing authority has determined that its staff has unique expertise or efficiencies which simply cannot be duplicated or provided for by independent contractors.

d. Program administrative functions - In the integrated RO option the staff would perform periodic evaluations of program plans, contracting procedures, contract management requirements, etc., and submit these evaluations for review and approval by the governing authority. An independent performance audit by the Legislature, or its designee, would be conducted every five years.

2. The Independent, Single-Purpose Administrator Option

The independent, single-purpose administrator option consists of an organization which focuses exclusively on RD&D activities, and which is separate and distinct from the state's overall energy policy making authority. Within this option the WG identified two variations, i.e. a classic, single-purpose RO, and a contract manager RO.

The "classic, single-purpose RO" has a standard corporate structure, with a CEO and staff serving at the pleasure of a board of directors. The CEO would prepare program plans and budgets, and would oversee implementation of the RD&D program. By contrast, the "contract manager, single-purpose RO" relies on researcher-initiated proposals, submitted in response to a Request For Proposals, as the mechanism to implement public interest RD&D activities. The board of directors would hire an organization to manage the RD&D process. Each of these single-purpose sub-options is described below.

2A. The Classic, Single-Purpose Administrator Option

In this option the RO would have a classic corporate form. There would be a charter and bylaws, a board of directors, a chief executive officer (CEO), and a staff. The sole function of this organization would be to conduct California's public-interest energy RD&D program. The organization could stand-alone (a non-profit corporation); it could be included as a semi-autonomous unit within an existing organization (such as the University of California or EPRI); or it could be a Joint Powers Authority combining the CPUC, the CEC and the University of California.

The board of directors would be composed of between six and ten technically expert, individuals, governed by written conflict of interest standards. The members of the board would be appointed for staggered terms by the CPUC or by another public body or officer. The board would meet periodically to address broad topics concerning the governance of the RO. The board would not be involved in the RO's day-to-day operations. Service on the board would be part time, typically involving one or two days per month. The board's responsibilities would include review and evaluation of the CEO's performance, and appointments to a stakeholder advisory committee. When called upon, the board would advise the Governor, the Legislature and others concerning RD&D aspects of the state's overall energy policies.

The CEO would be responsible for the day-to-day operations of the RO. He or she would serve at the pleasure of the board. The staff would act under the direction of the CEO to assist in carrying out his or her responsibilities.

a. Policy making functions - In this classic, single-purpose option, the RO would not make overall state energy policy, but would develop its own RD&D program policies, consistent with overall state energy policy.

b. Program planning functions - In the classic, single-purpose option the CEO would be responsible for preparing a draft program plan and budget for review and approval by the board. In preparing draft plans, the CEO would consult closely with the stakeholder advisory committee. The plan would address a period of several years. It would aim for balance between near-term and longer-term renewables, energy efficiency, and environmental RD&D. It would exploit opportunities for collaboration with other RD&D organizations and would enhance the state's RD&D infrastructure. The board would be responsible for assuring that the program plan was consistent with and supportive of state energy policy.

c. RD&D implementation functions - In the classic, single-purpose option the CEO would be responsible for implementing the plans that the board approved. The primary mechanism for carrying out the program plan would be to contract with appropriate individuals and/or organizations for the performance of research. The CEO and staff would also be responsible for implementing the technology transfer part of the plan. Technology transfer would be a key mechanism for coordinating the efforts of the RO with energy efficiency and renewables programs funded by the public goods charge.

d. Program administration functions - In the classic, single-purpose option the CEO would be responsible for devising procedures (to be approved by the board) for contractor selection and for the administration and management of the RD&D contracts. These procedures should be fair and efficient and they should foster collaboration. The procedures would include mechanisms for awarding and managing multi-year contracts. The CEO, assisted by the staff, would be responsible for using these procedures to select RD&D contractors and then to administer and manage the contracts. The CEO would establish a tracking and review system for the RD&D contracts and would make periodic reports to the public regarding the efficiency and effectiveness of the RO's RD&D program. The RO would be subject to an annual audit of its accounts. Every three years the RO's management practices and its RD&D program would be subject to the review of an independent expert panel appointed by the Legislature or by another public body or officer.

2B. The Contract Manager, Single-Purpose Administrator Option

This option envisions the RO primarily as a mechanism to solicit and award researcher-initiated proposals on public interest RD&D. The RO would have a minimal staff and its primary function would be contracting.

The board of the RO would consist of voting and non-voting members. The voting members would include representatives of customer groups (residential, commercial, industrial and agricultural users); utilities; state energy agencies; public interest groups (such as NRDC and UCS); and academic experts. The non-voting members might be the Electric Power Research Institute, the Gas Research Institute, and other entities with RD&D expertise and a financial stake in the outcome of RO decisions.

The CPUC or Governor would make board appointments with overlapping terms. Board members would be appointed based on their independence, judgment, and expertise in RD&D. Board positions are part-time, and members' remuneration will be limited to expense reimbursement. The work of the board would be done by its members' efforts, with permanent staffing limited to a small number of administrative and support personnel. The RO would implement the board's plans. The information below describes how the public interest RD&D administration functions are apportioned between the board and the RO.

a. Policy making functions - In the contract manager, single-purpose option the board would be available to the CEC, CPUC and the Legislature to provide input to these bodies in their deliberations regarding policies and programs that support public interest RD&D. The board may request assistance from the RO in formulating its recommendations, but neither the board nor the RO would have any direct policy making responsibilities.

b. Program planning functions - In the contract manager, single-purpose option the board would develop and periodically revise research objectives for public interest RD&D, criteria for project selection and evaluation, and administrative procedures for proposal solicitation and acceptance (intellectual property provisions, etc.). Project eligibility guidelines should be based on the public interest RD&D definition and surcharge scope guidance contained in this report.

For the annual solicitation on public interest RD&D proposals, the board would decide what research areas to emphasize in the solicitation, based on members' expert judgment regarding public interest RD&D needs and ongoing RD&D efforts. "Planning" for public interest RD&D would be limited to this annual decision on what research areas should be the focus of the solicitation.

The RO would do no research on its own, nor would it need to plan a research agenda, since that function would be done by the board, as described above. RO planning functions would be limited to day-to-day operational and financial planning.

c. RD&D implementation functions - In the contract manager, single-purpose option the RO would release an annual solicitation (Request for Proposals, or RFP). This approach is similar to that used by the CEC, DOE and other academic/government organizations to award grants for research proposals. The proposal review would follow a typical scientific proposal selection process. The RO would assemble topical area review teams comprised of technical experts and one board representative. The teams would review the proposals submitted to the RO based on project selection criteria established by the board.

The project evaluation criteria should include, at a minimum, the following:

- 1) Quality of technical plan;
- 2) Expertise in area of RD&D;
- 3) Clear statement of anticipated public interest benefits;
- 4) Documentation of other activities in area (by proposer and other entities);
- 5) Financial performance;
- 6) Well-developed plan for market entry; and
- 7) Cost proposal.

The RO staff would consolidate team recommendations on which proposals to fund and present them to the board for approval. The RO would then negotiate RD&D contracts with winning proposers selected through the process outlined above. The RO would establish reporting requirements to monitor RD&D performance, and would take any actions necessary to ensure performance consistent with contracts. Contract issues that cannot be resolved by the RO would be brought to the board for resolution.

d. Program administration functions - In the contract manager, single-purpose option the board would oversee the RO to ensure that RD&D projects are monitored and that funds are properly managed. The RO would be subject to annual audits of internal and contract funds, and would provide quarterly updates of research progress to the board. An annual report summarizing research progress, status and issues would be given to the board, and made publicly available.

The board may request input from the RO regarding any needed changes in the scope or level of the surcharge, if it determines that there is evidence that such changes would allow the organization to better meet its objectives. If the board concludes that changes are necessary, it would carry its recommendations to the CPUC or Governor for action.

The board would periodically review (possibly every five years) RO performance, and recommend any changes in the RO's procedures to the CPUC or Governor for action. If the RO's performance is deemed unsatisfactory, the board would take any needed action to correct the situation or recommend that a new RO be selected.

3. The Utility Administrator Option

Utilities, either municipal utilities or investor-owned utilities, may choose to administer all, or a portion of, the RD&D activities financed by Public Goods Charge funds collected from their ratepayers, subject to audit by a statewide public interest RD&D board, or they may elect to forward all or a portion of the funds to the Research Organization (RO) created in response to electric industry restructuring. The RO portion of this option could be organized according to several of the administration options previously described in this chapter. However, for the purposes of the discussion detailed below, this option presumes that the RO would follow the "contract manager, single purpose administrator" format.

Allowing utilities (municipals and IOUs) to administer public interest RD&D funds requires an oversight structure that avoids financial conflict-of-interest and assures utilities act in the public interest. The board, which would have oversight of the utilities and the RO, could be modeled after the coalition proposal on energy efficiency initiatives, which would have nine voting and six non-voting members. The voting members would be representatives of four customer groups (residential, industrial, commercial and agricultural users), two state regulator, two public interest groups, and one academic expert. The non-voting members would be IOUs and munis, and possibly the Electric Power Research Institute and Gas Research Institute.

The CPUC or Governor would make board appointments. Board members would be chosen based on their independence, judgment and expertise in RD&D. Board members would be appointed for overlapping terms. Board member remuneration would be limited to expense reimbursement, and the work of the board would be done by its members' efforts, with permanent staffing limited to a small number of administrative and support personnel. The RO would implement the board's plans.

a. Policy making functions - In the utility administrator option the board would be available to the CEC, CPUC and the Legislature to provide input to these bodies in their deliberations regarding state policies and programs that support public interest RD&D. The board may request assistance from the RO and utility staff managing public interest RD&D activities in formulating recommended public interest RD&D goals, but neither the board nor the RO would have any direct state energy policy making responsibilities.

b. Program planning functions - In the utility administrator option the board would establish and periodically revise a research agenda, consisting of overall goals for the statewide public interest RD&D program. The research agenda would apply equally to all entities that administer surcharge funds.

Utility managers and staff responsible for public interest RD&D would develop plans for an annual RD&D program which include updates regarding any multi-year research projects, consistent with the board-developed agenda. The board would have the right and obligation to audit the utilities' performance.

The board would decide what research areas to emphasize in the solicitation, based on members' expert judgment regarding public interest RD&D needs and ongoing RD&D efforts. "Planning" for statewide public interest RD&D would be limited to this annual decision confirming multi-year research plans and determining what research areas should be the focus of the annual solicitation.

For the RO, the board would determine research objectives and criteria for project selection, and administrative procedures for proposal solicitation and acceptance. Project eligibility guidelines should be based on public interest RD&D definition and surcharge scope guidance contained in this report. The board would be responsible for assuring that RO programs do not duplicate research activities managed by the utilities. RO planning functions would be limited to day-to-day operational and financial planning.

c. RD&D implementation functions - In the utility administrator option utility managers and staff would be responsible for implementing the public interest program RD&D plans consistent with board policies. They would determine, for each project, whether the project could most effectively be conducted by in-house staff with expertise in the research area, or whether the project should be awarded through a competitive solicitation. The utilities would establish reporting requirements to monitor RD&D performance, and would take any actions necessary to ensure performance consistent with contracts.

The RO would release an annual solicitation (Request for Proposals, or RFP). It would assemble topical area review teams comprised of technical experts and one board representative. The teams would review the proposals submitted to the RO based on project selection criteria established by the board. The project evaluation criteria should include, at a minimum, the following:

- 1) Quality of technical plan;
- 2) Expertise in area of RD&D;
- 3) Clear statement of anticipated public interest benefits
- 4) Documentation of other activities in area (by proposer and other entities);
- 5) Financial performance;
- 6) Well-developed plan for market entry; and
- 7) Cost proposal.

RO staff would consolidate team recommendations on which proposals to fund and present them to the board for approval. After board approval, the RO would negotiate RD&D contracts with winning proposers selected through the process outlined above. The RO would establish reporting requirements to monitor RD&D performance, and would take any actions necessary to assure performance consistent with contracts. Contract issues that could not be resolved by the RO would be brought to the board for resolution.

d. Program administration functions - In the utility administrator option the board would audit the utilities and oversee RO public interest RD&D programs to assure that RD&D projects are conducted appropriately and that funds are properly managed. Utilities and the RO would be subject to audits of internal and contract funds, and would provide periodic updates of research progress to the board. An annual report summarizing research progress, status and issues would be given to the board by the RO and each utility, and made publicly available.

The board may request input from the utilities and RO regarding any needed changes in the scope or level of the surcharge, if it determines that there is evidence that such changes would allow the organization be better meet its objectives. If the board concludes that changes are necessary, it would carry its recommendations to the CPUC or Governor for action.

The board would periodically conduct a comprehensive review (possibly every five years) utility and RO performance and recommend any changes procedures to the CPUC or Governor for action. If a utility's performance is deemed unsatisfactory, the board could recommend that the CPUC or Governor require that utility's portion of surcharge funds be transferred to the RO for management. If the RO's performance is deemed unsatisfactory, the board would take any needed action to correct the situation, or recommend selection of a new organization to manage the public interest RD&D funds.

TABLE 4.1

SUMMARY OF PUBLIC INTEREST RD&D ORGANIZATIONAL OPTIONS

Category of Organization	Integrated/Multi-Purpose	Single Purpose (Classic)	Single Purpose (Research Contracts Administrator)	Utility Administrator
Structure	Multi-purpose state energy policy board, executive officer and expert staff in one statewide organization.	Single purpose board of directors (does not make state energy policy), executive officer and expert staff in one statewide organization.	Single purpose board of directors (does not make state energy policy) and a research contracts administrator in one statewide organization.	Single purpose board of directors (does not make state energy policy) and both a research contracts administrator and various utility administrators located throughout the state.
Board	Expert Disinterested Full-time Small Legislatively approved.	Expert Disinterested Part-time Large Appointed by CPUC or other public body.	Expert Stakeholder Part-time Large Appointed by CPUC or Governor.	Expert Stakeholder Part-time Large Appointed by CPUC or Governor.
Policy Making Functions				
Develop state energy policy?	Yes	No	No	No
Provide input to state policy?	Yes	Yes	Yes	Yes
Responsible party?	Governing authority	Board	Board	Board and utilities
Planning Functions				
Developed by whom?	Executive officer and staff.	CEO, with stakeholder advisory committee input.	Board (research objectives only)	Board (develops statewide research agenda) and utilities (develop plans).
Reviewed/approved by whom?	Governing authority	Board	Board approves solicitation outcome.	Board approves solicitation outcome.
Implementing RD&D				
	RO contracts out most of the RD&D activities. In-house activities permitted in limited circumstances.	RO contracts out most of the RD&D activities. In-house activities permitted in limited circumstances.	RO contracts out all RD&D activities through the RFP process.	RO contracts out all RD&D activities through the RFP process. Utilities both contract out and manage in-house activities.
Administrative Functions				
Evaluations	Periodic, by staff.	CEO establishes tracking and review system.	Board oversees administrator functions.	Statewide board evaluates utility and administrator functions.
Audits	Every five years by Legislature or designee.	Every three years by panel appointed by Legislature or other public body.	Annual audits of research contracts administrator.	Periodic audits of utility and administrator.

D. PROS AND CONS OF THE VARIOUS RD&D ADMINISTRATIVE OPTIONS

The "pros and cons" listed in the section below were suggested by various members of the WG, but do not necessarily reflect the consensus of the group.

1. Pros and Cons of the Integrated, Multi-Purpose Option

a. Serve the broad public interest

Pros: The independent, multi-purpose administrator option would serve the public interest in several ways: (1) it would be governed by a statewide, publicly accountable, economically disinterested board; (2) policy making and program implementation would be integrated within one organization to assure that RD&D programs are actually consistent with the state's overall energy policies; (3) the multi-purpose nature of the organization would increase the likelihood that RD&D efforts are carried out in a strategic manner which complements other statewide energy concerns.

Cons: The statewide focus of this option may not fully address local concerns. The broad energy policy focus of this option also may not be consistent with the objectives of a public interest RD&D organization. Since the board and the executive officer will have many other duties, the responsibility for managing the RD&D program may have to be delegated to less senior officials. This factor, combined with other priorities of the multi-purpose organization, may detract from the public interest RD&D mission.

b. Support state energy policy

Pros: The independent, multi-purpose option would seek to assure that state energy policies and RD&D programs are fully integrated and implemented. In addition, this option would provide direct feedback from the RD&D program to policy makers.

Cons: An agency that is responsive to changing energy policy directives may not be able to support stable, longer-term RD&D projects. Also, statewide energy policies may conflict with the goals of public interest RD&D as defined in this report. As a result, the public interest RD&D emphasis on renewables, energy efficiency and environmental issues may be lost, or may become a lower priority in comparison to other statewide energy policies.

c. Address needs of consumers

Pros: In an independent, multi-purpose option, the governing authority will receive continuous input from its technical staff, qualified advisory committees, stakeholders, and the public at all stages (policy development, planning, implementation and review). This should assure that the statewide needs of consumers are met.

Cons: The statewide focus of this option may not adequately address local concerns. The broad energy policy focus of this option also may not be consistent with the objectives of a public

interest RD&D organization. Since this option integrates other public purpose programs (e.g. energy efficiency) it may not capture the benefits of administering these programs separately, or at the local level. Finally, the governing commission may only have indirect links to stakeholders and various political concerns of such an organization may lead to program biases.

d. Open planning process

Pros: In the independent, multi-purpose option the governing authority would receive open, public input from its staff, its advisory committees, stakeholders and the public at all stages (policy development, planning, implementation and review).

Cons: This open, public process may, at times, delay actual RD&D program implementation, and existing public agency decision making processes may not provide the flexibility envisioned for the public interest RD&D organization. Also, the governing authority may be unwilling to support technically sound, but politically unpopular projects.

e. Effective and efficient program implementation

Pros: In the independent, multi-purpose option the governing authority would be able to rely on an expert technical staff and existing state agency expertise. The comprehensive and multi-purpose nature of this option may also improve the overall value of the actual RD&D activities themselves.

Cons: State contracting procedures are cumbersome and inefficient, and other pre-existing administrative processes may hamper efficient and effective RD&D efforts. Also, the broad focus of a multi-purpose agency may diminish the attention specifically given to RD&D activities. Hiring and salary constraints also exist through the civil service process, which could adversely affect the hiring of the best expertise available. Finally, this option supports a bureaucracy which may yield less efficient results.

f. Maintain public accountability

Pros: In the integrated option all policy development, program planning, program implementation, and program review would be conducted through an open public process. Program evaluation reports will be prepared for public review by the board, stakeholders, and the Legislature.

Cons: High public participation levels in this integrated option may, at times, impair the efficiency of implementing the RD&D programs, or may produce technically questionable results.

g. Collaborate and enhance RD&D capabilities

Pros: The statewide focus of this option will help to consolidate limited RD&D funds, thereby effectively leveraging these funds with federal and other research organization resources. The integrated, multi-purpose administrator would be expected to engage in comprehensive

collaboration between a wide range of RD&D participants assembled by technical advisory committees.

Cons: The inflexibility, time requirements, and compliance costs of state contracting procedures may directly impede collaborative efforts. Also, lengthy public review procedures and difficulties in protecting intellectual property rights could further impair collaboration.

2A. Pros and Cons of the Classic, Single-Purpose Administrator Option

a. Serve the broad public interest

Pros: In the classic, single-purpose option, the expert board and staff would be well qualified to identify those RD&D activities that serve the interests of all Californians in areas not adequately addressed by competitive or regulated research entities. A financially disinterested board helps to minimize financial conflicts of interest.

Cons: The exclusive RD&D focus of this single-purpose option may overlook the broader public interest. Moreover, a stakeholder board might be better able to advocate for the needs of the most interested parties. A stakeholder board might also be better able to engage the participation of the most interested parties in the activities of the RO's RD&D program.

b. Support state energy policy

Pros: In the classic, single-purpose option the charter and bylaws of the RO would require it to support state energy policy. However, the organizational structure may insulate the RD&D program from rapid policy shifts, and the greater stability that results may be beneficial to the RD&D program.

Cons: There would be a less direct link between the RD&D program and state's overall energy policy in this option than in an integrated organization that was also responsible for developing state energy policy.

c. Address needs of consumers

Pros: This organization is designed to address the needs of all Californians. A financially disinterested board focused solely on RD&D will be able to address these needs without being distracted by other agendas.

Cons: This option might be less sensitive to local consumer needs than options that allow for decentralized utility administration.

d. Open planning process

Pros: In the classic, single-purpose option the stakeholder committee provides a mechanism for stakeholder input. The planning process for this option makes it possible for the organization to

pursue long-term objectives over a multi-year period by developing and sustaining projects that support these objectives. The plan will give focus to the RD&D program and increase the likelihood that the RO's RD&D projects will complement one another.

Cons: The planning process for this option is more expensive and time consuming than a process that is limited to an annual RFP.

e. Effective and efficient program implementation

Pros: Since the only functions of the classic, single-purpose RO are to plan, fund and manage a public interest energy RD&D program, the CEO and staff can focus on these tasks without distractions. The CEO's performance will be evaluated solely on his or her management of the RD&D program. In a single-purpose organization the career path for staff seeking advancement may be toward greater responsibility within the RD&D program. Unlike in multi-purpose organizations, there will be no incentive for talented staff to seek lateral transfers into divisions with larger budgets. Since the focus of the organization is on RD&D, its procurement procedures will be designed for RD&D contracts and those in charge of procurement will be RD&D specialists. This will make RD&D contracting more expeditious. Unlike an organization that only administers an annual RFP, this RO will have the resources to engage in technology transfer to support energy efficiency and renewables programs that are funded by the public goods charge.

Cons: It would be easier for a multi-purpose organization to coordinate the RD&D program with other programs that were being conducted within the same organization. The relatively small single-purpose RO might be unable to capture some of the economies of scale that could be captured by a larger multi-purpose organization (e.g., specialized departments for administration, personnel and for legal affairs).

f. Maintain public accountability

Pros: The option's open planning process provides a mechanism for public input. Periodic public reports allow interested parties to keep track of the RO's activities. Requirement for periodic review by an independent expert panel creates greater accountability than is usual for existing RD&D organizations in California. Since most review would occur after completion of the RD&D activities, decision processes won't be impeded.

Cons: Except for the RO's RD&D plan, there are no mechanisms for prior review of the organization's actions. As a result, some mistakes may be made. The structure of the review process will probably favor projects with statewide impact as opposed to projects that address local concerns.

g. Collaborate and enhance RD&D capabilities

Pros: The organization's RD&D plan will make explicit provision for collaborative RD&D and for enhancing California's RD&D infrastructure. Contracting procedures will be designed to facilitate collaboration and staff resources will be available to address infrastructure issues.

Cons: A stakeholder board, especially one with members who were involved with other organizations that were conducting RD&D programs, would be better able to facilitate collaboration and infrastructure development where board members' own organizations are involved.

2B. Pros and Cons of the Contract Manager, Single-Purpose Administrator Option

a. Serve the broad public interest

Pros: In the contract manager, single-purpose option representation on the board by a diverse group of entities with interest, expertise, and varying perspectives on public interest RD&D would strive to ensure that the RD&D program serves the broad public interest. Periodic audits and review by a public entity would ensure that all projects fit the definition of public interest RD&D.

Cons: Board members may make RD&D program decisions that serve the interests of the constituents of the members' organizations, rather than a broader public interest perspective. Also, the narrow, exclusive focus on RD&D alone may not serve the broad public interest as comprehensively as the integrated, multi-purpose option.

b. Support state energy policy

Pros: In the contract manager, single-purpose option the board is expected to support state energy policies through the implementation of the RD&D program, and by providing expert advice on public interest RD&D matters.

Cons: Neither the board nor the RO has a direct reporting relationship to a state policy agency, as the case would be in the integrated, multi-purpose option, so decisions may not be fully consistent with state energy policy. Under this option there will be only limited board review to see how RD&D is actually impacting on or following state energy policies.

c. Address the needs of consumers

Pros: In the contract manager, single-purpose option, the board would include direct stakeholder representation by consumer organizations who could help the board and the RO determine whether the RD&D program addresses the needs of consumers. The link to consumers needs would be made an explicit criterion for evaluating research proposals.

Cons: The statewide focus may not adequately address local concerns. Under this option consumer groups may not have adequate representation on the governing board.

d. Open planning process

Pros: In the contract manager, single-purpose option RD&D activities are researcher-initiated and thus provide an opportunity for all RD&D organizations to propose public interest RD&D

projects for surcharge funding. This may encourage higher levels of participation than the other options. Research direction will be at a very high level, restricted to guiding the general framework for research proposals.

Cons: A decision making process managed by a board and staff may not allow adequate opportunity for public participation. RD&D planning will be incomplete because this organizational option only provides planning through a single RFP. Also, there may not be adequate opportunity for feedback from the contract administrator to improve future planning. The proposals selected could be a "grab-bag" of ideas and might not represent a well thought out set of public interest RD&D projects.

e. Effective and efficient program implementation

Pros: Since the RO's functions are focused exclusively on program implementation, this limited charter could enable the organization to focus its resources on streamlined RD&D contract negotiation and management, rather than on multiple, potentially competing functions described in the first option. This option will be very "lean" in terms of administrative overhead.

Cons: Placing RD&D contract management in a separate organization from planning functions may complicate the program implementation process, more than the integrated option or the independent, classic administrator option. RD&D will not be targeted to accomplish goals over a multi-year period. One RFP could result in "apples and oranges" responses for multiple technologies. Limited staff resources may impair the effective and efficient administration of public interest RD&D funds. This option may not be suitable for funding more than \$10 million annually.

f. Maintain public accountability

Pros: In the contract manager, single-purpose option the board would maintain public accountability through the active involvement of its members, through regular audits of RO activities, and by making its reports publicly available.

Cons: Neither the board nor the RO has a direct reporting relationship to a public entity. Annual reports and periodic reviews may not provide sufficient technical review of completed projects.

g. Collaborate and enhance RD&D capabilities

Pros: In the contract manager, single-purpose option RFPs could be structured to give preference to RD&D proposals that include a plan to collaborate and enhance RD&D infrastructure.

Cons: RD&D collaboratives usually do not develop from an RFP process. The limited planning and contracting mechanisms envisioned for the board and RO may not be adequate to provide incentives for RD&D collaboration. Finally, the minimal administrative structure of this option may impede the RO's ability to improve the quality of RD&D efforts through collaboration because the RO does not have the resources to work with the researchers to optimize projects.

3. Pros and Cons of the Utility Administrator Option

a. Serve the broad public interest

Pros: In the utility administrator option representation on the statewide board by a diverse group of entities with interest, expertise, and varying perspectives on public interest RD&D would seek to assure that the statewide RD&D program serves the broad public interest. Audits and periodic performance reviews of the RO and the utilities by the board would be issued for public review and comment.

Cons: A statewide stakeholder board may make RD&D program decisions that reflect the interests of its constituent member organizations, rather than a broad public interest perspective encouraged by the integrated, multi-purpose option, or the financially disinterested board in the classic administrator option. Similarly, utility boards may make RD&D program decisions which focus on local concerns rather than on the broad public interest. Under performance-based ratemaking (PBR), future oversight of regulated utility R&D spending may be very limited. Without adequate oversight, IOUs may inappropriately use public interest RD&D funds to do RD&D for regulated functions or competitive activities, thereby benefiting their own customers or shareholders. Similarly, municipal utilities might inappropriately use RD&D PGC funds for non-RD&D activities. Focus on RD&D alone may not fully serve the public interest. Also, having numerous potential utility administrators may fragment limited RD&D resources, thereby reducing their overall benefit to the public at large. Finally, this option is contrary to the CPUC's direction that the RO be a non-utility entity.

b. Support state energy policy

Pros: In the utility administrator option the board would be expected to support state energy policies through the implementation of the RD&D program, and by providing expert advice on public interest RD&D matters.

Cons: Neither the board nor the RO has a direct reporting relationship to a state policy agency as would be the case in the integrated, multi-purpose option, so decisions may not be consistent with state energy policy.

c. Address needs of consumers

Pros: In the utility administrator option the board would include representatives of each customer class who would help the board and the RO determine whether the RD&D program addresses the needs of consumers. The link to consumer needs would be made an explicit criterion for evaluating research proposals.

Cons: Utility administration of some portion of the public interest RD&D funds would be fragmented, and possibly administered in a self-dealing manner, thus failing to meet statewide consumer needs. Utility managed funds may not meet the broad-based needs of consumers because of the possible focus on local and corporate interests. A large total funding level might

encourage cross-subsidization between public interest and regulated or competitive research activities.

d. Open planning process

Pros: In the utility administrator option research direction would be at a very high level, restricted to guiding the general framework for research proposals. Utility-administered public interest RD&D program plans would be subject to review by the board, whose members would bring input representing the constituents their organizations represent. The RFP approach used by the RO is designed to provide an opportunity for all RD&D organizations to propose public interest RD&D projects for surcharge funding.

Cons: A planning process managed by a board and utility staff, rather than a public entity or expert board, may not allow adequate opportunity for public participation. Also, a widely dispersed program, administered by many utilities, reduces the ability of statewide public interest groups and stakeholders to participate in and impact the decision making process unless the funding is quite large.

e. Effective and efficient program implementation

Pros: Utilities have long engaged in RD&D activities to benefit their customers and the public at large. Several California utilities have substantial R&D departments, with the staff and resources to pursue R&D in various fields. Allowing these utilities the opportunity to administer public interest R&D funds, complying with guidelines and restrictions imposed by the board, would reduce costs and increase efficiency by shifting the need for administrative staff to the utilities, who typically would already have staff in place for these functions. While utility staff time spent on administering public interest RD&D funds would be paid for by the public interest RD&D fund itself, no additional staff or facilities would be needed. The RO's functions are focused on streamlined RD&D contract negotiation and management, with a minimal staff.

Cons: Fragmenting limited RD&D funds among many utility administrators might reduce the effective use of these limited resources relative to the potential efficiencies of an integrated option. Redundant RD&D activities by different utilities and the RO may result in significant administrative overhead. For the RO, placing RD&D contract management in a separate organization from planning functions may also complicate the program implementation process. Tracking and managing relatively small sums administered by a large number of institutions could complicate the oversight and management process. Infrequent, after the fact reviews, offer significant leeway for non-compliance. Finally, providing public funds to utility companies which have other competitive and regulatory agendas may not lead to an efficient and effective public interest RD&D program.

f. Maintain public accountability

Pros: In the utility administrator option the board would maintain public accountability through the active involvement of its members, through regular audits of utility and RO activities, and by

making its reports publicly available. Utilities would provide reports to the board and public.

Cons: Limiting statewide review to audits only may not provide adequate oversight authority. Neither the board nor the RO has a direct reporting relationship to a public entity. Also, if small amounts of funds are distributed through many administrators, it will be very hard for an independent entity to track and evaluate the proper use of these funds. The CPUC's review will be minimal, and the size of the funds in question make it unlikely that public interest groups would be willing or able to review such widely dispersed expenditures.

g. Collaborate and enhance RD&D capabilities

Pros: The need to foster collaboration on RD&D projects is recognized by the California RD&D community. One major barrier to collaboration generally is lack of knowledge about existing or planned research projects. The California Utility Research Council (CURC) was established to help overcome this barrier. As the electric utility industry becomes more competitive, many observers expect collaborative projects and entities such as CURC to disappear. Having public interest RD&D activities conducted by utility staff who are also involved in regulated RD&D activities could minimize the lack of knowledge barrier to collaboration, and avoid duplication of research. In the utility administrator option the RO's RFP could be structured to give preference to RD&D proposals that include a plan to collaborate and enhance RD&D infrastructure. With a single board overseeing both utilities and the RO, board members would be in a position to note opportunities for more effective collaboration.

Cons: Having fragmented utility administrators may make effective collaboration more difficult to achieve. The planning and contracting mechanisms envisioned for the RO may not provide adequate incentives for collaboration. Localized funding may not only make collaboration difficult, but may also impede statewide RD&D infrastructure support efforts since collaboration decisions may be based more on local leveraging criteria than on statewide concerns.

CHAPTER V: RD&D TRANSITION AND IMPLEMENTATION ISSUES

The CPUC indicated that the RD&D Working Group (WG) report should "discuss transition requirements to an independent administrator." (D. 96-03-022, pp. 28-29). The WG identified the following topics as major transition issues.

A. HOW SHOULD THE NEW RESEARCH ORGANIZATION BE SELECTED?

Four options were identified for selecting a public interest RD&D administrator: 1) select among existing organizations; 2) modify an existing organization; 3) form a new organization; or 4) perform a competitive solicitation.

1. Select Among Existing Organizations

The Legislature or CPUC could select an existing organization to administer the public interest RD&D funds. The selection could be made based on information provided by parties in their filings on this WG report, or the Legislature or CPUC could seek to expand the choices. One way to expand the choices would be to issue an announcement seeking information from all organizations interested in administering the funds based on the functions and criteria outlined in this WG report. The Legislature or CPUC would then select the research organization from the entities expressing interest.

2. Modify An Existing Organization

The CPUC could recommend that the Legislature modify an existing organization to administer public interest RD&D programs based on the options listed in Chapter IV. These modifications would address any existing policies and procedures that are inconsistent with the goals and performance criteria listed in this report. The WG could be requested to assist the CPUC in reviewing existing organizations and in developing recommended modifications.

3. Form A New Organization

The CPUC could recommend that the Legislature form a new organization to administer public interest RD&D programs based on the options listed in Chapter IV. The WG could be requested to assist the CPUC in developing its recommendation based on the goals and performance criteria outlined in Chapter IV.

4. Perform A Competitive Solicitation

For this selection process option, no specific entity is identified for the public interest RD&D administrator role. Instead, an oversight board for the public interest RD&D funds would be designated by the Legislature or CPUC, and the oversight board would then issue a Request for Proposal for an RD&D administrator. (The oversight board composition is discussed in several

organizational options proposed in Chapter IV, and the Legislature or CPUC could select the board composition thought to best represent the public interest.) The Request for Proposal could either be written by the an existing agency staff or by staff which the oversight board employs, based on the functions and performance criteria outlined in Chapter IV of this report. The selection criteria for the administrator should include:

- public interest RD&D experience;
- financial stability;
- contract management expertise; and
- written management/operations plan.

The WG could be requested to act as technical consultants in reviewing administrator proposals.

5. Pros and Cons of Each Selection Approach

The following "pros and cons" were offered by various members of the WG. However, they do not necessarily reflect a consensus view on any particular point.

a. Selecting an existing organization

Pros: This option has the advantage of speed, i.e., since the organization already exists, management structures and staff will already be in place. This option also has the advantage of utilizing existing organization expertise and experience with public interest programs. Finally, this option may reduce initial start-up costs and may also reduce administrative costs in the long-run.

Cons: The major disadvantage of this option is that RD&D administration will be subject to the organization's existing rules and procedures, which may conflict with some of the goals and criteria that the WG thinks are important. For example, an existing organization may not want or be able to be open its planning process to public review and scrutiny. Existing contracting rules on ownership of research results and intellectual property is another area of potential conflict.

b. Modifying an existing organization

Pros: This option would provide some existing organizations that might not otherwise fit the goals and criteria in Chapter IV with the opportunity to become the public interest RD&D administrator. Modifying an existing organization is the middle ground between selecting an existing or new organization, since it could be in operation fairly quickly and still have most of the benefits of a new organization in terms of streamlined procedures and ownership rights, etc.

Cons: A major disadvantage of this option is that it would be slower to startup than selecting an existing organization. Also, modifying an existing organization may be more difficult both politically and practically than simply creating a new organization or selecting an existing organization.

c. Forming a new organization

Pros: The new organization option also offers the opportunity to streamline administrative procedures for managing the research funds while attracting talented research managers from across the country. Also, if a new organization is created through a Joint Powers Agreement (JPA), it would bring together the organizational strengths of a number of existing entities.

Cons: Forming a new organization will be time-consuming and costly. Unless a JPA is used, a new organization would fail to take advantage of existing organization resources and expertise.

d. A competitive solicitation

Pros: This option provides an opportunity for many potentially interested organizations to present qualifications, including organizations which do not currently exist but which might be organized as a result of the solicitation. It does not require the Legislature or the CPUC to decide what the best organizational structure might be for the public interest RD&D administrator (e.g., public agency, private organization, non-profit firm, or university system). It allows existing organizations to offer modified approaches or organizational structures.

Cons: A major disadvantage of this option is that it would probably take longer for the solicited organization to start work than simply selecting an existing organization, though this process might be somewhat quicker than modifying or forming an entirely new organization. Other disadvantages of this option are the costs of conducting the competitive solicitation process, and the total uncertainty concerning the outcome of the process (e.g., What if no qualified entities decides to bid? What if the bid levels are extremely high?).

B. WHEN SHOULD THE SURCHARGE COLLECTION BEGIN?

"By January 1, 1997, the public goods RD&D costs should no longer be embedded in electric rates and instead should be collected as part of the PGC applied to electric retail sales." (D. 95-12-023, p. 160).

"[However,] [w]e will ...delay the January 1, 1997 changes to bills until all such line items and surcharges are determined, no later than January 1, 1998." (D. 96-03-022, p.28).

The CPUC's potential January 1, 1998 surcharge funding date is problematic because it delays the itemization and collection of PGC funds until the very date on which the public interest research organization (RO) is expected to commence operations. If surcharge funds are not collected prior to January 1, 1998, the RO may not be able to commence effective operations for several months thereafter, at a minimum. Therefore, the WG recommends that the CPUC continue to authorize the funding of public interest RD&D programs through existing utility rates until the collection of authorized surcharge funds is effectively implemented by the RO.

C. WHAT SHOULD BE DONE WITH EXISTING PUBLIC INTEREST RD&D PROGRAMS UNTIL THE NEW RESEARCH ORGANIZATION IS FUNCTIONAL?

"...[R]esearch that serves a broader public interest, which may not be pursued by the monopoly, should not be lost in the transition to a more competitive environment." (D. 95-012-063, p. 158).

"We have determined that it is appropriate to continue funding for various public purpose programs during the transition period." (D. 96-03-022).

The WG recognizes that neither the new competitive structure nor the public interest research organization is likely to be fully in place on January 1, 1998. Therefore, in order to avoid undesirable gaps in public interest RD&D activities, the WG recommends that utilities be allowed to continue these activities until the RO is functional.

Contributions by IOUs to collaborative research organizations such as EPRI and CIEE may also be reduced during the transition as utilities modify their ratepayers-funded contributions to support only research related to regulated functions. In time and with changes in participation rules, these ratepayer-funded contributions may be supplemented by contributions from shareholders, from the RO, or from other entities in the competitive market.

The CPUC should consider ways to maintain public interest RD&D funding and related activities at utilities during the period between now and when the RO is fully funded and operational. The WG considered but did not reach consensus on the following options. The WG also recognized that there may be other options for continuing public interest RD&D activities during the transition.

1. Direct utilities to maintain current funding levels for specific public interest RD&D projects until the RO becomes operational;
2. Direct the utilities to continue funding specific projects, but reimburse the utilities at year's end out of collected surcharge funds; and
3. Start collecting surcharge funds prior to January 1, 1998, so that funds are available when the RO becomes operational.

D. HOW CAN EXISTING PUBLIC INTEREST RD&D PROGRAMS BE SMOOTHLY TRANSFERRED FROM UTILITIES TO THE NEW RESEARCH ORGANIZATION?

"After a transition period, perhaps by January 1, 1998, the funds collected through a surcharge for public goods research should be administered by an independent, nonutility entity." (D. 95-12-023, p. 160).

The WG recommends that preparations begin immediately for the transfer of existing public interest RD&D programs from utilities to the RO. As a first step, the WG recommends that

utilities identify all existing public interest RD&D programs which they are still administering. Then, after the RO is established, the utilities should coordinate with the RO and arrange for the transfers of all necessary information, staff and other materials.

Some changes in the funding and administration of existing utility public interest RD&D projects may occur before the transition to a public interest RO is completed. Therefore, the WG agrees that it is important for utilities to document progress and results when closing out RD&D activities, so that these efforts can be readily understood by other researchers interested in reviewing or re-initiating these utility efforts in the future.

All members of the California Utility Research Council (CURC) are represented in the WG. The members agree that the CURC can serve an important bridging function in keeping its members and the new RO abreast of transitional RD&D program activities. This will be particularly important for activities that have been conducted through utility collaborative efforts.

E. WHAT SPECIFIC CPUC ACTIONS ARE NEEDED FOR RD&D?

1. Decide remaining funding issues pertaining to IOU-related public interest RD&D activities (e.g., amount, scope, collection methods, etc.).
2. Decide remaining governance and administration issues pertaining to IOU-related public interest RD&D activities, and their relationship to other public interest programs (e.g., energy efficiency, renewables, etc.).
3. Specify how public interest RD&D activities should be maintained during the remaining transition period, and how the IOUs should proceed to coordinate with the RO.
4. Modify existing CPUC RD&D guidelines as necessary.
5. Make appropriate recommendations to the Legislature consistent with the items above.

F. WHAT LEGISLATION IS NEEDED?

1. Establish administrative and expenditure criteria for public interest RD&D funds.
2. Modify PU Code 740.1, and FERC and CPUC RD&D definitions and guidelines.
3. Possibly modify the RD&D laws pertaining to the CEC.