

**PUBLIC UTILITIES COMMISSION**505 VAN NESS AVENUE
SAN FRANCISCO, CA 94102-3298**FILED**10-30-12
02:17 PM

October 30, 2012

Agenda ID #11700
Ratesetting

TO PARTIES OF RECORD IN APPLICATION 11-07-008.

This is the proposed decision of Administrative Law Judge (ALJ) Timothy J. Sullivan, previously designated as the presiding officer in this proceeding. It will not appear on the Commission's agenda sooner than 30 days from the date it is mailed. This matter was categorized as ratesetting and is subject to Pub. Util. Code § 1701.3(c). Upon the request of any Commissioner, a Ratesetting Deliberative Meeting (RDM) may be held. If that occurs, the Commission will prepare and publish an agenda for the RDM 10 days beforehand. When the RDM is held, there is a related ex parte communications prohibition period. (See Rule 8.3(c)(4).)

When the Commission acts on the proposed decision, it may adopt all or part of it as written, amend or modify it, or set it aside and prepare its own decision. Only when the Commission acts does the decision become binding on the parties.

Parties to the proceeding may file comments on the proposed decision as provided in Article 14 of the Commission's Rules of Practice and Procedure (Rules), accessible on the Commission's website at www.cpuc.ca.gov. Pursuant to Rule 14.3, opening comments shall not exceed 15 pages.

Comments must be filed pursuant to Rule 1.13 either electronically or in hard copy. Comments should be served on parties to this proceeding in accordance with Rules 1.9 and 1.10. Electronic and hard copies of comments should be sent to ALJ Sullivan at tjs@cpuc.ca.gov and assigned Commissioner. The current service list for this proceeding is available on the Commission's website at www.cpuc.ca.gov.

/s/ MARYAM EBKE for
Karen V. Clopton, Chief
Administrative Law Judge

KVC:lil

Attachment

Decision **PROPOSED DECISION OF ALJ SULLIVAN** (Mailed 10/30/2012)

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Application of Pacific Gas and Electric Company (U39M), San Diego Gas & Electric Company (U902E) and Southern California Edison Company (U338E) for Authority to Increase Electric Rates and Charges to Recover Costs of Research and Development Agreement with Lawrence Livermore National Laboratory for 21st Century Energy Systems.

Application 11-07-008
(Filed July 18, 2011)

DECISION GRANTING AUTHORITY TO ENTER INTO A RESEARCH AND DEVELOPMENT AGREEMENT WITH LAWRENCE LIVERMORE NATIONAL LABORATORY FOR 21ST CENTURY ENERGY SYSTEMS AND FOR COSTS UP TO \$152.19 MILLION

TABLE OF CONTENTS

<u>Title</u>	<u>Page</u>
DECISION GRANTING AUTHORITY TO ENTER INTO A RESEARCH AND DEVELOPMENT AGREEMENT WITH LAWRENCE LIVERMORE NATIONAL LABORATORY FOR 21 ST CENTURY ENERGY SYSTEMS AND FOR COSTS UP TO \$152.19 MILLION	
1. Summary	2
2. Background.....	6
3. Jurisdiction.....	10
4. The Proposed RD&D Contract.....	17
4.1. Electric Resource Planning	19
4.2. Electric and Gas Operations	20
4.3. Cyber Security	21
4.4. Governance	22
4.5. Other Elements	25
5. Major Issue Before the Commission.....	27
5.1. Does the Commission Have Authority to Fund the CES-21 Project?	28
5.1.1. Positions of Parties	28
5.1.2. Discussion: The Commission has Authority to Fund a Broad Range of Research Projects.....	34
5.2. Is the Proposed Project Reasonable? Should it be Modified in Any Way?	37
5.2.1. Positions of Parties	38
5.2.2. Discussion: With Amendments, the CES-21 Research Project is Beneficial to Customers, and Reasonable to Fund; Tier 1 Advice Letters Enable the Commission to Ensure Beneficial Results.....	47
5.2.3. The Commission Will Review CRADA and Proposed Research Projects Each Year via a Tier 1 Advice Letter	59
5.2.4. Since the Commission Reviews Projects in Advice Letter Filings, Direct Commission Participation on CES-21 Board is Not Needed.....	60
5.3. If Modified to Be Consistent with Adopted Policies then CRADA and the CES-21 Program Should Be Authorized.....	61
6. Other Objections to the CES-21 Project	64

7. Outstanding Motions 67
 7.1. Motion for Recusal 67
 7.2. Other Motions 69
8. Conclusion 69
9. Comments on Proposed Decision 70
10. Assignment of Proceeding 70
Findings of Fact 70
Conclusions of Law 76
Order 78

**DECISION GRANTING AUTHORITY TO ENTER INTO A RESEARCH AND
DEVELOPMENT AGREEMENT WITH LAWRENCE LIVERMORE NATIONAL
LABORATORY FOR 21ST CENTURY ENERGY SYSTEMS
AND FOR COSTS UP TO \$152.19 MILLION**

1. Summary

This decision authorizes Pacific Gas and Electric Company (PG&E), Southern California Edison Company (SCE), and San Diego Gas & Electric Company (SDG&E) to enter into a five-year research and development agreement with Lawrence Livermore National Laboratories (LLNL).

The proposed agreement is known as 21st Century Energy Systems. The expected research benefits of this project include \$552 million in savings by 2020 from improved resource planning, \$8.75 million savings over the next five years from improvements in natural gas operations, improved safety and reliability from enhanced capabilities to model electricity and gas flows, and improvements in cyber security as utilities learn directly from LLNL how to deal with evolving and persistent cyber threats. In addition, the supercomputing capabilities of LLNL will enable the processing of the three terabytes of data that smart meters will produce daily. The expected economic benefits alone dwarf the \$150 million in project costs over its five-year life.

This decision authorizes the utilities to spend up to \$30 million a year for five years on research activities, for a total of \$152.19 million total costs (when franchise fees and uncollectibles are included). The decision also allocates these costs to each of the utilities (55% of the costs to PG&E, 35% of costs to SCE, and 10% of the costs to SDG&E) and adopts a ratemaking proposal for each utility to permit the recovery of costs.

More specifically, this decision approves the 21st Century Energy Systems research project (CES-21) for a number of reasons that will benefit utility customers: 1) the research findings are very likely to improve the safety of gas operations by reducing the gas pressure in transmission pipes needed to maintain distribution flows, by improving leak detection, and by predicting pipe breaks; 2) the project is very likely to provide benefits to ratepayers that exceed costs across both electric and gas operations; 3) research pertaining to the operations of electric and gas utilities is currently underfunded; 4) the research pertaining to cyber security will better protect both electric and gas operations and customer privacy; 5) only the use of supercomputers, a core strength of LLNL, will enable utilities to process the three terabytes of data a day produced by smart meters and thereby improve grid operations and stability; 6) the proposed research uses the special research strengths of LLNL in super computing, modeling, and cyber security; 7) the proposed research program is consistent with the research goals set forth in Pub. Util. Code § 740.1;¹ and 8) the CES-21 advances the public interest, and is therefore consistent with § 399(c).

The decision relies on the application's "illustrative cases" to identify productive areas of research and to show the types of benefits that the CES-21 project will produce. The decision finds that the use of "illustrative cases" is especially appropriate in light of the rapidly changing technologies and energy priorities. Indeed, requiring more details on research projects at this time would risk locking the research program into unproductive projects and would likely

¹ All statutory references are to the Public Utilities Code unless otherwise noted.

prevent realization of the benefits that can arise through collaborative projects based on the emerging needs of the utilities and the expertise of LLNL.

This decision examines and modifies the proposed governance and oversight of the proposed CES-21 program. This decision rejects the proposed governance structure in which the CES-21 project's Board of Directors has authority to fund research with ratepayer funds as it wishes. Instead, this decision adopts guidelines for the CES-21 research proposal and criteria that each specific research project must meet. Specifically, the Cooperative Research and Development Agreement (CRADA) must be consistent with five guidelines:

1. The CRADA must restrict research to four promising areas that are inherently related to the research goals identified in § 740.1: Gas Operations, Electric Operations, Electric Resource Planning, and Cyber security.
2. The CRADA must limit total yearly expenditures to \$30 million and total expenditures to \$150 million.
3. The Advice Letter seeking approval of the CRADA shall allocate costs with PG&E responsible for 55% of the costs, SCE responsible for 35% of the costs, and SDG&E responsible for 10% of the costs. These utilities may recover these costs using the regulatory mechanisms adopted in this decision.
4. The CRADA must agree that all research projects conducted under this proposal must meet the specific criteria adopted in this decision.
5. The CRADA should propose a governing board of six, with three members chosen one each from the participating utilities and three members chosen with relevant research backgrounds in either academia or research institutes.

The research projects performed under the CRADA must meet the following criteria:

1. The total research expenditures in a given year must not exceed \$30 million.

2. Each research project should demonstrate that it falls within the four approved areas.
3. Each research proposal must have the support of a majority of the Board of Directors and must provide an explanation if a proposed project will not be funded by all utilities.
4. Each proposed research project shall also include a “business case” analysis, as described in the application, and which, among other things, shall show that projected benefits exceed projected costs and that the research is not duplicative.

The decision requires an annual Tier 1 advice letter filing with the Commission asking approval of research proposals and projects. The annual Tier 1 advice letter filing should also include, at a minimum the proposed research projects that will be conducted in the upcoming year.

Since this decision requires the review of both the CRADA and research conducted under it through an advice letter filing, there is no need for the elaborate oversight structure proposed by the utilities and opposed by The Utility Reform Network (TURN) and the Division of Ratepayer Advocates (DRA). This decision treats the application as a request for authority for the utilities to enter into a research contract, the CRADA, and to conduct research projects under the CRADA. As such, the proposed research can be clearly accommodated within the Commission’s traditional processes for approving research projects (which the decision reviews at length) and there is no need for Commission participation on the CES-21 project’s board. Moreover, this process, in which research projects are subject to an advice letter filing, raises no legal issues pertaining to the delegation of Commission authority.

The decision also discusses in detail the objections of TURN and DRA to specific aspects of the research proposal and resolves outstanding motions. In particular, the decision dismisses a TURN motion for the recusal of the assigned

Commissioner because TURN's analysis conflates interest and due diligence in policy with evidence of prejudgment. The arguments of TURN are unpersuasive, TURN's conclusions have no basis in fact, and the decision denies the motion.

2. Background

The procedural background of this matter reflects the pattern of ratemaking proceedings at this Commission that require evidentiary hearing to resolve.

On July 18, 2011, Pacific Gas and Electric Company (PG&E), San Diego Gas & Electric Company (SDG&E) and Southern California Edison Company (SCE) (Joint Applicants) filed Application (A.) 11-07-008 requesting the Commission to:

- (1) Authorize the IOUs [investor-owned utilities, i.e. Joint Applicants] to recover the costs for funding the CES-21 [21st Century Energy Systems] Project up to a maximum of \$150 million in program funding over five years, with the funding shared among the IOUs as follows: PG&E (55%), SCE (35%), and SDG&E (10%); and
- (2) Grant such additional relief as the Commission may deem proper.²

Resolution ALJ-3278 (July 28, 2011) categorized the proceeding as ratesetting and reached a preliminary determination that hearings would prove necessary to resolve this matter.

On August 4, 2010, SCE submitted proof of compliance³ with Rule 3.2(b) and (c), which required that applicants for an increase in rates provide

² Application at 1.

notification to certain public agencies and provide a general notice to the public of the proposed increases in rates in a “newspaper of general circulation.”⁴

On September 2, 2011, the DRA and TURN each filed a protest to the application.⁵

On September 9, 2011, SDG&E submitted proof of compliance with Rules 3.2(b), 3.2(c) and 3.2(d).⁶

On September 12, 2011, the Joint Applicants filed a Reply to the Protests.⁷

On September 13, 2011, PG&E submitted proof of compliance with Rules 3.2(b), 3.2(c) and 3.2(d).⁸

On September 19, 2011, the Commission held a pre-hearing conference (PHC) in San Francisco to address the issues concerning the management of this proceeding, including proposals concerning the scheduling of the proceeding. At the PHC, the Administrative Law Judge (ALJ) concluded that the application

³ *Southern California Edison Company's (U338E) Proof of Compliance with Rule 3.2(b) and (c) of the Commission's Rules of Practice and Procedure*, August 4, 2011.

⁴ Commission Rules of Practice and Procedure (Rules), http://docs.cpuc.ca.gov/WORD_PDF/AGENDA_DECISION/143256.PDF Rule 3.2(b) and (c), at 27.

⁵ *Protest of the Division of Ratepayer Advocates (DRA Protest)*, September 2, 2011; *Protest of The Utility Reform Network to Joint Application of Pacific Gas and Electric Company, San Diego Gas and Electric Company and Southern California Edison Company to Recover Costs of an Agreement with Lawrence Livermore National Laboratory for 21st Century Energy Systems (TURN Protest)*, September 2, 2011.

⁶ Rule 3.2(e) (Rules, Rule 3.2(e) at 28) permits a single filing noticing compliance with Rules 3.2(b), 3.2(c) and 3.2(d).

⁷ *Reply of Pacific Gas and Electric Company, San Diego Gas and Electric Company and Southern California Edison Company to Protests*, September 12, 2011.

⁸ See note 5, above.

lacked detail and ruled that the application should be amended to include testimony supporting the application.⁹

On October 18, 2011, an Assigned Commissioner Ruling and Scoping Memo set the scope and schedule for this proceeding.

On October 19, 2011, the Joint Applicants amended their application and served prepared testimony on parties to this proceeding.

On November 2, 2011, in response to the amended application, DRA filed a protest to the application.¹⁰

On November 7, 2011, TURN filed a Motion to Dismiss the Joint Application.¹¹ Joint Applicants opposed both motions.

On January 17, 2012, the ALJ issued a Ruling denying TURN's Motion to Dismiss and amending the procedural schedule.¹² The Ruling also requested that the Rebuttal Testimony of the Joint Applicants provide greater detail on the proposed governance structure overseeing the 21st Century Energy Systems research project (CES-21).

On January 26, 2012, an ALJ Ruling amended the schedule for evidentiary hearings.¹³

⁹ PHC, Transcript (TR) at 48.

¹⁰ *Protest of the Division of Ratepayer Advocates*, November 2, 2011.

¹¹ *Motion of the Utility Reform Network to Dismiss the Joint Application of Pacific Gas and Electric Company, San Diego Gas & Electric Company and Southern California Edison Company to Recover Costs of an Agreement with Lawrence Livermore National Laboratory for 21st Century Energy Systems*, November 7, 2011.

¹² *Administrative Law Judge's Ruling Denying The Utility Reform Network's Motion to Dismiss and Amending Procedural Schedule*, January 17, 2012.

¹³ *Administrative Law Judge's Ruling Amending Procedural Schedule*, January 26, 2012.

On March 22, 2012, TURN filed a motion seeking the recusal of assigned Commissioner Peevey.¹⁴

On March 30, 2012, DRA filed a motion to strike portions of the rebuttal testimony, arguing that it raised new issues for the first time.¹⁵

On April 3, 2012, TURN filed a response to the DRA motion to strike.¹⁶

On April 3, 2012, DRA and TURN, filed a joint motion to stay the hearings.¹⁷

On April 4, 2012, a telephonic conference¹⁸ was held to consider both DRA's motion to strike and the motion of DRA and TURN to stay evidentiary hearings. As a result of the conference, the hearings were rescheduled from April 10-11, 2012 to May 10-11, 2012, thereby giving DRA and TURN additional time to conduct discovery and prepare cross-examination questions.¹⁹ No testimony was stricken from the record.

¹⁴ *Motion of The Utility Reform Network Seeking Recusal of Assigned Commissioner Peevey, March 22, 2012.*

¹⁵ *Motion of Division of Ratepayer Advocates to Strike Portions of the Rebuttal Testimony Submitted by the Joint Utilities, March 30, 2012.*

¹⁶ *Response of The Utility Reform Network to Motion of Division of Ratepayer Advocates to Strike Portions of the Rebuttal Testimony Submitted by the Joint Parties, April 3, 2012.*

¹⁷ *Joint Motion of Division of Ratepayer Advocates and The Utility Reform Network to Stay Hearings in Order to Preserve Fundamental Fairness between the Parties Regarding New Arguments Submitted by the Joint Utilities, April 3, 2012.*

¹⁸ The scheduling and results of the telephonic conference are reported in e-mails dated April 3 and April 4, 2012, from Sullivan, Timothy J., that are part of the correspondence file in this proceeding.

¹⁹ *Notice Resetting Dates of Evidentiary Hearing, April 5, 2012.*

On April 24, 2012, SCE filed proof of compliance with Rule 13.1(b).²⁰ SDG&E made a similar compliance filing on May 1, 2012,²¹ and PG&E made a similar compliance filing on May 8, 2012.²²

Evidentiary Hearings took place at the Commission Offices in San Francisco on May 10 and May 11, 2012.

Parties filed opening briefs on July 20, 2012²³ and reply briefs on August 1, 2012.²⁴ With the submission of reply briefs, the proceeding was deemed submitted.

3. Jurisdiction

California state law has supported Commission approval and oversight of utility research projects for many years. The Commission is “a ‘state agency of constitutional origin with far-reaching duties, functions and powers,’ whose ‘power to fix rates [and] establish rules’ has been ‘liberally construed.’”²⁵ In

²⁰ *Southern California Edison Company’s Proof of Compliance with Rule 13.1(b)*, April 24, 2012.

²¹ *San Diego Gas & Electric Company Rule 13.1 Proof of Publication of Notice of Hearings*, May 1, 2012.

²² *Pacific Gas and Electric Company’s Proof of Rules 13.12(b) Compliance*, May 8, 2012.

²³ *Opening Brief of the Division of Ratepayer Advocates (DRA Brief)*, July 20, 2012; *Opening Brief of The Utility Reform Network (TURN Brief)*, July 20, 2012; and *Opening Brief of Pacific Gas and Electric Company, San Diego Gas & Electric Company, and Southern California Edison Company (Joint Applicants Brief)*, July 20, 2012.

²⁴ *Reply Brief of the Division of Ratepayer Advocates*, August 7, 2012; *Reply Brief of The Utility Reform Network*, August 7, 2012; and *Reply Brief of Pacific Gas and Electric Company, San Diego Gas & Electric Company, and Southern California Edison Company*, August 7, 2012.

²⁵ *Southern California Edison Co. v. Peevey* (2003) 31 Cal. 4th 781, 792 (internal citations omitted).

general, the Commission has broad authority over public utilities to do all things cognate and germane to the regulation of public utilities.²⁶ By statute,

The commission may supervise and regulate every public utility in the State and may do all things, whether specifically designated in this part or in addition thereto, which are necessary and convenient in the exercise of such power and jurisdiction.²⁷

This broad grant of authority to the Commission permits the Commission, as part of its general supervision and regulation of a public utility, to either require or approve research projects.

This grant of authority is balanced by a broad responsibility of the Commission to ensure that all rates and charges are reasonable. Section 451 provides in part that:

All charges demanded or received by any public utility, or by any two or more public utilities, for any product or commodity furnished or to be furnished or any service rendered or to be rendered shall be just and reasonable. Every unjust or unreasonable charge demanded or received for such product or commodity or service is unlawful.²⁸

Thus, the Commission has the responsibility to determine whether the rates and charges used to finance a research project are “just and reasonable.”

²⁶ *Consumers Lobby Against Monopolies v. Public Utilities Com.* (1979) 25 Cal.3d 891, 9095-906. The Commission’s broad authority is, however, limited by both “express legislative directions” to the Commission and “restrictions upon [the Commission’s] power found in other provisions of the [Public Utilities Act] or elsewhere in general law.” *Assembly v. Public Utilities Commission* (1995) 12 Cal.4th 87, 103.

²⁷ § 701.

²⁸ § 451.

For research, development and demonstration (RD&D) projects, the Pub. Util. Code provides more specific guidance. Section 740 states:

For purposes of setting the rates to be charged by every electrical corporation, gas corporation, heat corporation or telephone corporation for the services or commodities furnished by it, the commission may allow the inclusion of expenses for research and development.²⁹

The Public Utilities Code also provides guidance to the Commission in reviewing proposed research projects:

The commission shall consider the following guidelines in evaluating the research, development, and demonstration programs proposed by electrical and gas corporations:

- (a) Projects should offer a reasonable probability of providing benefits to ratepayers.
- (b) Expenditures on projects which have a low probability for success should be minimized.
- (c) Projects should be consistent with the corporation's resource plan.
- (d) Projects should not unnecessarily duplicate research currently, previously, or imminently undertaken by other electrical or gas corporations or research organizations.
- (e) Each project should also support one or more of the following objectives:
 - (1) Environmental improvement.
 - (2) Public and employee safety.
 - (3) Conservation by efficient resource use or by reducing or shifting system load.

²⁹ § 740.

- (4) Development of new resources and processes, particularly renewable resources and processes which further supply technologies.
- (5) Improve operating efficiency and reliability or otherwise reduce operating costs.³⁰

In addition, § 399 (c) makes the funding of research and development a cornerstone of California's energy policy:

(c) The Legislature further finds and declares that in order to ensure that the citizens of this state continue to receive safe, reliable, affordable, and environmentally sustainable electric service, it is essential that prudent investments continue to be made in all of the following areas: 5) To advance public interest research, development and demonstration programs not adequately provided by competitive and regulated markets.³¹

For the period from January 1, 2002 to January 1, 2012, § 399.8(d)(1) required the Commission to order SDG&E, SCE, and PG&E to collect \$62,500,000 per year to fund "research, development and demonstration."³² These funds were used to support the California Energy Commission's (CEC) Public Interest Energy Research (PIER) program. In addition, § 381 required a "special rate component to collect the revenues to fund these programs." This requirement for special funding for basic research ended in 2012, but the state policy announced by the Legislature in § 399(c) supporting research in the public interest remains in effect.

³⁰ § 740.1.

³¹ § 399(c)(5).

³² § 399.8(d)(1).

The Commission recently directed that each of the three large electric IOUs consolidate its research efforts in the Electric Program Investment Charge (EPIC) program's triennial applications on a going forward basis.³³ Since this proceeding was initiated July 2011, before the EPIC rulemaking proceeding was instituted in October 2011, the directive contained in D.12-05-037 does not apply to the Joint Applicant's request before the Commission in this proceeding, and the Commission's issuance of this decision today does not contradict D.12-05-037's directive.

Historically, the Commission supported significant research efforts, both by the utilities and by the Electric Power Research Institute (EPRI). In D.93-05-011, for example, the Commission noted:

EPRI plans, funds and manages a nationwide coordinated research and development (R&D) program for its member electric utilities. EPRI's 1992 budget was approximately \$580 million of which some \$400 million is generated by dues. California utilities currently provide \$27 million in EPRI dues.³⁴

In D.93-05-011, the Commission authorized PG&E to recover \$15,433,000 for 1993 EPRI dues and approved "equivalent amounts subject to appropriate escalation in 1994 and 1995."³⁵

Each of these three large companies funded research through the payment of dues to EPRI for many years. The dues, and the resultant research, were reviewed by the Commission as part of each General Rate Case filing. Under the

³³ Decision (D.) 12-05-037 at 29.

³⁴ D.93-05-011 (1993) 49 CPUC2d 209, 1993 Cal. PUC LEXIS 380 *3.

³⁵ D.93-05-011 (1993) 49 CPUC2d 209, 1193 Cal. PUC LEXIS 380, *15-*16.

system of dues payments, ratepayers funded research with little direct input from the Commission on research projects, but with strict oversight into the level of support and the resulting rates. A review of the level of support for research, the resulting rates, and EPRI research initiatives were common parts of a General Rate Case.

The practice of funding research through dues payments to EPRI was discontinued in the mid-90's. At that time, the Commission sought to introduce competition in electric generation as part of market deregulation. This policy, which envisioned no role for PG&E, SDG&E and SCE in power generation, rendered EPRI's research on non-nuclear central station generation irrelevant for California. The Commission noted in D.95-12-055:

As the Commission moves the industry toward increased competition, PG&E's RD&D in generation is not appropriately funded by the general body of ratepayers. Its RD&D efforts should focus more on improvements in the distribution and transmission system. PG&E's proposal [to remove EPRI dues from rates] here recognizes this trend.³⁶

Even as this 1995 decision led to a cessation in PG&E's funding of EPRI research, the decision seems prescient in its identification of the need to focus research on the issues concerning the safe and reliable operations of distribution and interconnected transmission systems. These issues are the focus of the research of the CES-21 project which the Joint Applicants have placed before us in this proceeding.

Finally, the Commission's General Order 96-B creates an advice letter review process and states:

The advice letter process provides a quick and simplified review of the types of utility requests that are expected neither to be controversial nor to raise important policy questions. The advice letter process does not provide for an evidentiary hearing ...³⁷

General Order 96-B creates three different levels of review. The General Order identifies Tier 1 advice letters as an appropriate review process for “A Contract that conforms to a Commission order authorizing the Contract, and that requests no deviation from the authorizing order.” A Tier 1 Advice Letter permits the Commission to review and reject any proposal, but deems the Advice Letter effective pending disposition. Note, however, that even if “effective pending disposition, all service rendered pursuant to the advice letter before disposition will be subject to a Commission order requiring ... such other or additional adjustments as the Commission may require.”³⁸ Thus, even though a Tier 1 review would remain effective while suspended pending final Commission resolution, utilities would be at risk for research costs incurred pending Commission disposition.

The General Order, in discussing the suitability of specific projects to a Tier 1 review, references D.93-02-013 as providing an example of the type of contract view suitable for Tier 1. D.93-02-013, which was adopted before General Order 96-B, set up an expedited seven-day review process for long-term gas storage contracts as long as the contracts met the guidelines adopted in that decision. There were only two guidelines: one for duration of the contract and

³⁶ D.95-12-055 (1995) 63 CPUC2d 570.

³⁷ General Order 96-B, General Rules, Section 5.1, Matters Appropriate for Advice Letters.

³⁸ General Order 96-B, General Rule, Section 7.3.3, Effective Pending Disposition.

one for pricing the contract. The pricing guidelines called for pricing at long run marginal costs, plus risk premiums. The decision states:

... but contracts that have durations within the announced guidelines and that are priced at LRMC [Long Run Marginal Cost] scaled to meet system revenue requirement -- without discounts, load balancing premiums, or other special features -- will not be subject to further Commission approval. Contracts meeting the guidelines will become effective seven days after filing. This short delay is necessary to allow time for staff review of conformance with the duration and price guidelines.³⁹

This process for reviewing contracts became the model for a Tier 1 advice letter review process.

Thus, the review of a contract to determine that it conforms to Commission policies is one of the prime examples of the use of a Tier 1 advice letter. Since this decision authorizes the utilities to enter into a contract, the Cooperative Research and Development Agreement (CRADA), consistent with the specific policies adopted in this decision, a Tier 1 advice letter, which can be disposed of through ministerial action, creates an appropriate process for review.

4. The Proposed RD&D Contract

The central issue before the Commission in this proceeding is whether the Commission should grant authority for the Joint Applicants to enter into a CRADA, a contract, which would create a research program known as the CES-21 Project.

The CES-21 Project would spend up to "\$150 million over five years, with the funding shared among the IOUs" with PG&E paying 55%, SCE paying 35%

³⁹ D.93-02-013 (1993) 48 CPUC2d 107.

and SDG&E paying 10%.⁴⁰ The funds would “recover the costs associated with a five-year CRADA with Lawrence Livermore National Laboratory.”⁴¹ The Joint Applicants state that “CES-21 Project activities and associated costs primarily will center around ... Cyber Security, Electric Resource Planning and Electric and Gas System Operations.”⁴² The Joint Applicants state:

In a nutshell, the objective of the CES-21 Project is to apply computationally-based problem solving resources to the emerging challenges of the 21st century energy system (electric and natural gas) for California. The project will utilize a joint team of technical experts from the IOUs and [Lawrence Livermore National Laboratory] LLNL who will combine data integration with the nation’s most advanced modeling, simulation and analytical tools provided by LLNL to provide unprecedented problem-solving and planning necessary to achieve California’s ambitious energy and environmental goals for the 21st century.⁴³

The Joint Applicants contend that the CES-21, with its tools and resources, should “translate into better operational performance, emergency preparedness, and cyber and physical security.”⁴⁴

Concerning the projects, the Joint Applicants state:

The Joint Utilities and LLNL in their testimony identified potential initial projects for CES-21 that are not exclusive, but which were chosen because each is in a category or cluster of

⁴⁰ Exhibit U-1 at 1-1.

⁴¹ *Id.*

⁴² *Id.* at 1-3.

⁴³ *Id.* at 1-3 to 1-4.

⁴⁴ Joint Applicants, Opening Brief at 10.

strategic “problems” and “opportunities” which the Joint Utilities and most energy policymakers believe should be a priority for further research, development and demonstration. As other high priority strategic problems and opportunities are identified, those too will be considered for CES-21 funding. However, the Project will not fund “undefined research.” In addition, as described in more detail ... below, the governance process will ensure that the funded research is defined, including evaluation of costs and benefits, consistent with other utility customer-funded RD&D programs.⁴⁵

For each of the research areas identified, the Joint Applicants provide details concerning the area of investigation and its potential for providing benefits.

4.1. Electric Resource Planning

For the area of electric resource planning, the Joint Applicants provided testimony that “utilities currently use commercial off-the-shelf or in-house developed modeling tools for planning electric systems” but that “these models are computationally intensive yet limited in their ability to represent the complexity of the electric grid.”⁴⁶ The Joint Applicants state that “CES-21 will seek to augment the functionality of existing models to better represent the complexity and responsiveness of the grid, as well as the range and volume of possible scenarios.”⁴⁷ The Joint Applicants state that “[b]ased on these potential modeling projects ... CES-21 could provide”⁴⁸ illustrative benefits of \$30 million

⁴⁵ *Id.*

⁴⁶ *Id.* at 11.

⁴⁷ *Id.* at 12.

⁴⁸ *Id.* at 14.

per year⁴⁹ in reduced load following costs and \$552 million in reduced resources⁵⁰ needed to integrate renewable resources.

4.2. Electric and Gas Operations

In the areas of electric and gas operations, the Joint Applicants have also identified particular areas of research. For electric operations, the Joint Applicants argue that enhanced monitoring and control capabilities will help integrate renewable intermittent resources that are critical to meeting California's Renewables Portfolio Standard and for managing the use of Once-Through Cooling Resources.

For gas operations, the Joint Applicants argue that through the use of supercomputing systems and models, "utilities could gain improvements in modeling speed, resolution, and fidelity"⁵¹ and thereby better calculate "pressure drops on a pipeline system while taking into account the various compressors, regulators and other equipment on the system."⁵² They contend that advanced operational monitoring and modeling will facilitate "leak detection, realistic training simulations, and 'what if' modeling"⁵³ thereby enhancing safety. In particular, advanced modeling could permit the gas companies to reduce pressures in the transmission system and still meet distribution pressure needs, thereby improving both safety and operating efficiencies.⁵⁴ In addition, Joint

⁴⁹ *Id.*

⁵⁰ *Id.*

⁵¹ *Id.* at 22.

⁵² *Id.*

⁵³ *Id.*

⁵⁴ TR at 242.

Applicants maintain that advanced computing will enable gas operations to model “how different flow control devices turn on and off and how that might affect pressure within the lines” and will “interrogate the physics” to determine “what does it take for a pipe to break as a function of, say, the soil it’s in.”⁵⁵

The Joint Applicants noted that expenditures for gas transmission are “approximately \$175 million per year” and testified “that if these expenditures could be reduced by just 1 percent as a result of enhanced modeling capabilities, the savings would amount to \$1.75 million per year, or \$8.75 million over five years.”⁵⁶ The Joint Applicants did not monetize the benefits of improved safety, which can be difficult to estimate.

4.3. Cyber Security

In the area of cyber security, “one of the initial priority projects that CES-21 will consider is using LLNL cyber-security experts and facilities to enable the IOUs to meet these cyber-security challenges, including building a more resilient, reliable grid and protecting customer privacy.”⁵⁷ The Joint Applicants argue that the collaboration with LLNL will produce cyber security benefits in three areas: “(1) information sharing, (2) through leadership via an active Public/Private partnership and (3) commercialization of cyber security operational capabilities.”⁵⁸ The strategy of the cyber security program is to build on the vast experience of LLNL in securing its weapons research and modeling capabilities from cyber attacks. The participation of LLNL will enable researchers to

⁵⁵ TR at 124.

⁵⁶ Joint Applicants Opening Brief at 23.

⁵⁷ *Id.* at 24.

“simulate, if you will, our technical environment and understand which areas of weaknesses are most likely to have the most significant negative impacts to reliability, to customer service, to operational capabilities, and, therefore, further optimize ... our finite set of resources on the things that are most valuable.”⁵⁹

As with safety, the Joint Applicants did not monetize cyber security privacy and system reliability benefits, which are difficult to quantify.

4.4. Governance

To guide the CES-21 research process over its five-year life, the Joint Applicants propose “that CES-21 expenditures and projects would be subject to an open and consensual governance process, including direct participation by the Commission itself in the investment planning and budget decisions of the program.”⁶⁰

The Joint Applicants propose a detailed governance process, as follows:

The CES-21 governance process proposed by the Joint Utilities includes the following key elements which meet – and in several respects, exceed – the governance and Commission oversight requirements for utility energy RD&D:

- The CES-21 Project will be governed by a Board of Directors consisting of voting members from each of the Joint Utilities, the California Public Utilities Commission (CPUC), and a member from academia appointed by the CPUC in a public process after consultation with the Energy Commission and relevant leaders from California research and academic institutions. In addition, non-voting members from the Energy Commission and California Independent System

⁵⁸ *Id.* at 25.

⁵⁹ TR at 247-248.

⁶⁰ Joint Applicants Opening Brief at 32.

Operator will be included. The Board of Directors will be independent of LLNL and other potential providers of services under CES-21.

- The meetings of the Board of Directors will be open to the public and subject to public access in the same way as meetings of other California public agencies.
- Prior to expending any funds authorized by this Application, the Joint Utilities and LLNL will negotiate and enter into a CRADA, which will be consistent with the provisions in the CES-21 Application and subject to final approval by the Board of Directors for the CES-21. The services provided by LLNL under the CRADA, which will be a five-year agreement, will be subject to the standards under the CRADA and U.S. Department of Energy (DOE) regulations for CRADAs, including the right of the Joint Utilities to perform audits of LLNL's performance and to withhold payments for non-performance or default on a specific work order, as provided under CRADA regulations.
- The CES-21 Board of Directors will approve the scope of work and administration of the specific research projects funded by CES-21. The Board of Directors also will have the authority to select an executive director and staff recommended by LLNL to manage the project activities, and may appoint such technical and advisory committees as it deems appropriate to assist in the project activities.
- In addition, the Board of Directors will approve a strategic plan, annual budgets, and allocation of staff and other resources to provide services under individual work orders requested by each utility (or jointly) and the proportional share of funding set forth in the Proposal. The Board of Directors will not have the authority to approve any new commitments or expenditures extending beyond the five-year term of the CRADA, or beyond the authority granted in this Application. All funding of projects to support the work

orders, including procurement of equipment, facilities, tools, computer software and hardware, will be subject to approval by the Board of Directors.⁶¹

The proposed CRADA will also permit early termination by the active parties:

The IOUs and LLNL, respectively, will have the right to terminate the CRADA upon 30 days written notice, in which case the obligation for performance will be terminated for all services that have not already been performed or paid for.⁶²

In addition to specifying the structure and operations of the Board of Directors, the CES-21 project places responsibility for specific governance tasks on the Board of Directors. These include: determining the “need for research;”⁶³ avoiding “duplicative research or funding;”⁶⁴ ensuring the “competitive solicitation of services;”⁶⁵ and ensuring the “transparency and public oversight of costs, benefits and deliverables.”⁶⁶ In addition, in supplemental testimony,⁶⁷ the Joint Applicants testified that the Board of Directors will “select projects that address the critical energy issues facing utilities, and that are in the best interest of California utility customers.”⁶⁸

⁶¹ *Id.* at 33-34, footnotes omitted.

⁶² Application at 12.

⁶³ Joint Applicants Opening Brief at 34.

⁶⁴ *Id.*

⁶⁵ *Id.* at 35.

⁶⁶ *Id.* at 35.

⁶⁷ Exhibit U-2.

⁶⁸ Joint Applicants Opening Brief. at 36.

Finally, the Joint Applicants detail the responsibilities of the Board of Directors, CES-21 goals, the selection of an Executive Director and the Executive Director's responsibilities, the need to develop and review "the business case" for each research project, and the need for a Research Director for each project.⁶⁹ Concerning "the business case," the Joint Applicants state that it:

will assess: (1) need for the research; (2) research goals and desired results; (3) similar research performed by others to date; (4) avoidance of duplicative research; (5) competitive alternatives to the provision of services from LLNL; (6) partnership opportunities with outside experts; (7) deliverables and milestones; (8) cost, staffing requirements and responsibilities; and (9) benefits to gas and electric customers.⁷⁰

4.5. Other Elements

The Joint Applicants propose that:

All equipment, tools, facilities, computer software and hardware, and other tangible and intangible assets, including patents, trademarks, copyrights and other intellectual property, that are procured or developed using the funding for the applied research and development element of the CRADA will be owned by the IOUs for the benefit of their customers in accordance with a joint ownership arrangement among the IOUs.⁷¹

The Joint Applicants also describe the project as having a goal of fostering private/public partnerships "between outside experts and LLNL, the Joint Utilities, and other California energy and environmental policymakers."⁷² The

⁶⁹ *Id.* at 36-37.

⁷⁰ *Id.* at 36.

⁷¹ Ex. U-1 at 1-14.

⁷² Joint Applicants Opening Brief at 38.

Joint Applicants describe in their Supplemental Testimony how they plan to gain the participation of both academic researchers and third party vendors.

Concerning academic researchers, the Joint Applicants state:

One of the roles of the member of the Board representing academia will be to focus on this very issue and act as a liaison with the major sources of research expertise available to support each project. Once the research project is approved, the research team will collaborate with the outside experts and participating research centers or academic institutions and involve them in the research as appropriate and to varying degrees, on a project by project basis.⁷³

Concerning third party vendors, the Joint Applicants state:

LLNL and the IOUs therefore expect to work collaboratively with existing vendors in Silicon Valley and across the State to enable and expedite the development of such enhanced tools to address pressing challenges facing the industry.⁷⁴

Concerning the project financing, “the Joint Utilities are specifically requesting a finding by the Commission that the funding requested in this application is expressly conditioned on full recovery of all verified costs in rates without further reasonableness review or restriction.”⁷⁵ Further, the Joint Applicants seek to request the recovery of revenue requirements “through distribution rates, except for projects that are generation related.”⁷⁶ In addition, under the proposal, if a utility does not approve of a project, it need not

⁷³ Ex. U-2 at 4-5

⁷⁴ Ex. U-2 at 5.

⁷⁵ Joint Applicants Opening Brief at 44.

⁷⁶ *Id.* at 44.

participate in the financing, but the project may proceed if approved by the Board of Directors:

If a utility does not approve a project, the project may go forward as a non-joint project, subject to approval by the Board of Directors. The participating utilities that want to go forward with the non-joint project without funding from the non-participating utility will negotiate their respective funding percentages for the non-joint project, subject to approval of the Board of Directors.⁷⁷

Finally, each utility specifies a cost recovery proposal consistent with its regulatory accounts.⁷⁸

5. Major Issue Before the Commission

The major issue before the Commission is whether to authorize the Joint Applicants to enter into the CRADA contract that creates the CES-21 Project as proposed. In addressing this issue, the Commission can approve the project as proposed, require modifications, or reject the proposal.

More specifically, the Commission must determine how to act on this application for authority to increase electric rates to engage in a five-year research project with LLNL that will cost \$150 million.

In conjunction with this major issue, there are a series of preliminary issues concerning whether the Commission has authority to approve the proposed research project and the governance structure it proposes.

In addition, if the Commission has authority to approve a research project, there are subsidiary issues concerning the reasonableness of this course of action.

⁷⁷ *Id.* at 43.

⁷⁸ *See Id.* at 45-46.

In particular, the Commission must determine whether the proposed research, is reasonable to fund and consist with the provisions of the Pub. Util. Code.

5.1. Does the Commission Have Authority to Fund the CES-21 Project?

The review of the Commission's statutory framework and current policies makes it clear that the Commission has authority to fund RD&D projects. In general, parties do not contest this authority.

Parties do, however, contest whether the proposed research, which leaves the selection and day-to-day administration of the research projects in the hands of an oversight board consisting of utility and Commission appointees, is lawful.

This section addresses the positions and arguments of the active parties on this issue.

5.1.1. Positions of Parties

DRA and TURN argue that the Commission cannot approve the research project as proposed by the Joint Applicants without committing legal error.

Specifically, TURN argues that the proposed board with voting seats assigned to three utility appointees, one Commission appointee, and one academic appointee has the following effects:

First, the Joint Utilities control a majority of the voting seats and therefore have the ability to control the Board's decisions.

Second, the Commission, with just one seat, cannot control the outcome of Board votes. Indeed, the balance of power on the board indisputably favors the utilities; the Commission's representative could not require or prevent any action, but if the

three utility-appointed members wish to see the project approved, the project would be able to be approved.⁷⁹

TURN argues further that the Commission distinguishes between “program oversight” and “program administration” and that the Commission itself has determined that:

... while it might be appropriate for the Commission to accept input on various non-discretionary matters, “it can and should maintain appropriate responsibility for final authority of the program, particularly in so far as policy and programmatic matters and final funding levels are concerned.”⁸⁰

TURN argues that the CES-21 Project grants the Board of Directors “complete discretion on which projects to fund” and that this would be “the exercise of discretion that the Commission has previously recognized may **not** be delegated.”⁸¹

TURN argues further:

The legality of the Commission’s delegation of authority to a third-party entity not subject to its jurisdiction depends on the nature of the decisions the third-party entity would make. Where, as here, the Board would engage in matters such as determining reasonable costs, program rules, and similar matters that fall within the “program oversight” category, the Commission cannot delegate the ultimate decision-making authority.⁸²

⁷⁹ TURN Opening Brief at 17.

⁸⁰ TURN Opening Brief at 20, citing D.11-12-035.

⁸¹ TURN Opening Brief at 20, emphasis in original.

⁸² *Id.* at 21.

TURN argues further that the “Commission has no authority or jurisdiction over LLNL, and its authority or jurisdiction over the CES-21 Project itself would be bounded by the contractual terms embodied by the CRADA [cooperative research and development agreement], and might also prove to be ‘none.’”⁸³

TURN argues further that the “degree of delegation exceeds the level of delegation permitted in prior decisions where ratepayer funds were involved.”⁸⁴ TURN then proceeds to discuss the California Emerging Technology Fund, the California Clean Energy Fund and the Stewardship Council and argues that they fail to provide a precedent for the proposed research plan.

Finally, TURN argues that the CES-21 is “rooted in addressing climate change”⁸⁵ and that the Commission by law:

... shall not adopt or execute any similar order or decision establishing a research program for climate change unless expressly authorized to do so by statute.⁸⁶

Thus, TURN concludes that law prohibits the Commission from approving the CES-21 research program.

DRA also argues that “the proposed governance is an illegal delegation of the Commission’s responsibilities, has no structure or limits and it is unclear how it would function.”⁸⁷ DRA states that:

⁸³ *Id.* at 21-22.

⁸⁴ *Id.* at 22.

⁸⁵ *Id.* at 26.

⁸⁶ *Id.* at 25.

⁸⁷ DRA Opening Brief at 13.

... the reality is that the utilities will maintain control over the decision-making process and outvote the Commission representative at any time. This would result in an unchecked delegation to the utilities of authority for spending ratepayer funds. In the limitless process envisioned by the utilities, they could fund any research project they chose, whether in California or elsewhere and there would be nothing the Commission could do afterward.⁸⁸

Finally, DRA argues that the proposal is too vague to enable the Commission to review it. DRA states:

The Application suffers from a lack of specificity in its project proposals. Before the Commission appropriates funds for research, development and deployment projects it should first identify exactly what it is funding and the purported benefits that may follow. As previously mentioned, the applicants have not yet identified specific projects and will leave that determination to the Board of Directors. However, as explained at the Hearing, there is no limitation on what the Board of Directors may fund ...

The Joint Applicants argue that “TURN’s and DRA’s legal and policy arguments against CES-21 should be rejected.”⁸⁹ More specifically, the Joint Applicants argue that the governance structure does not “constitute an “unlawful” delegation of the Commission’s authority.”⁹⁰ The Joint Applicants compare the Commission-approved EPIC program and its review process with the proposed CES-21 projects and its governance structure and argues that the

⁸⁸ *Id.* at 13.

⁸⁹ Joint Applicants Reply Brief at 18.

⁹⁰ *Id.* at 15.

“governance process is remarkably similar,” and therefore legal.⁹¹ The Joint Applicants argue that this is the case because:

CES-21, like EPIC, includes an overall strategic investment plan outlined in the CES-21 application, an annual budgeting and planning process approved by the collaborative board of directors, and an opportunity for public and stakeholder input. CES-21 includes formal criteria for approval of specific projects similar to the criteria adopted by the Commission for investment plans under EPIC. CES-21 includes open and transparent reporting to the Commission on an annual basis, just like EPIC.⁹²

The Joint Applicants argue that the exercise of discretion is not exceptional, but is common in any RD&D project approved by the Commission. The Joint Applicants state that:

... the Commission approved an EPIC process under which the Energy Commission and the individual utilities will submit RD&D “investment plans” to the Commission for review and approval, and if approved, will then proceed themselves to solicit, approve and implement specific RD&D projects consistent with the approved “investment plans.”⁹³

Furthermore, the Joint Applicants cite to the Commission’s traditional rate case process of approving research projects on a programmatic basis, without review of the specific research projects. The Joint Applicants argue

... in the Commission’s more traditional reviews of the individual utilities’ General Rate Cases, the Commission has routinely approved the utilities’ RD&D expenditures on a

⁹¹ *Id.* at 4.

⁹² *Id.* at 4.

⁹³ *Id.* at 15.

programmatic basis, leaving the utilities with discretion to implement specific projects consistent with the Commission's guidance and criteria for the programs.⁹⁴

The Joint Applicants also counter TURN's argument that the degree "of delegation proposed for CES-21" exceeds that approved by the Commission in other proceedings.⁹⁵ The Joint Applicants argue instead that discretion is appropriately constrained because:

The Joint Utilities have adequately described the scope of proposed research and the Application seeks approval of this scope of work (i.e., "program elements" per D.06-01-024).⁹⁶

The Joint Applicants also argue that the discretion exercised by the Board of Directors and staff in the CES-21 research is consistent with legal precedents and Commission practice, stating:

... the Joint Utilities' proposal to establish a Board of Directors to administer the CES-21 program is legally no different than the Commission's decision to delegate authority to administer the [California Solar Initiative] CSI RD&D program to staff, consultants and the [California Energy Commission] CEC. The Joint Utilities are simply requesting that a similar amount of discretion be delegated to a Board of Directors that includes a Director representing the CPUC. As described previously, such a governance approach will provide the Commission with more

⁹⁴ *Id.* at 15-16.

⁹⁵ *Id.* at 16.

⁹⁶ *Id.* at 17. D.06-01-024 established the California Solar Initiative. This decision stated that, since the decision defined "program elements" it was possible for the Commission to delegate the administrative tasks associated with this program to a third party. The decision delegated administration of an RD&D program to Commission staff, the utilities, and third party consultants. (2006 Cal. PUC LEXIS 529 *56.)

control and oversight than it normally exercises over RD&D programs.⁹⁷

Finally, the Joint Applicants also argue against the legal argument of TURN and DRA that Assembly Bill (AB) 1338 bars the funding of the CES-21 project. The Joint Applicants argue:

When similar arguments were raised regarding the applicability of AB 1338 to the scope of RD&D activities proposed in the EPIC proceeding, the Commission expressly found that it had adequate and broad legal authority under other provisions of the Public Utilities Code to fund energy RD&D programs. In any event, the scope of RD&D proposed for CES-21 does not include “climate change research,” and so the prohibition in AB 1338 is inapplicable to CES-21 on its facts.⁹⁸

5.1.2. Discussion: The Commission has Authority to Fund a Broad Range of Research Projects

Any review of ratepayer-funded RD&D projects must address the inherent tension between Commission oversight over the expenditure of ratepayer funds and the creative, sometimes unpredictable process by which RD&D evolves and ultimately produces ratepayer benefits. As with many issues that come before the Commission, regulation must strike a balance. In this case, the Commission must strike a balance between, on the one hand, pre-review of proposals and imposing regulatory controls over the expenditures and, on the other hand, regulatory oversight that so constrains research activities that it limits the ability of the research to adapt to the results produced in the research process and ultimately jeopardizes the optimal ratepayer benefits that research can produce.

⁹⁷ *Id.* at 17.

⁹⁸ *Id.* at 18.

In conducting research, discretion is necessary to enable the researchers to uncover and pursue areas of research that their initial investigations show are promising and to abandon areas that initial research suggests will not prove productive.

Because of the inherent complexity of the issues raised by the funding of research, it is not surprising that both legislation and the Commission have addressed these issues previously. A review of these laws and decisions can indicate what the Commission considers the appropriate balance between control and discretion and enable us to determine whether the proposed project strikes an appropriate balance.

As noted above, § 701 grants the Commission broad authority to do things “necessary and convenient in the exercise” of the power to supervise and regulate public utilities, but § 451 requires that charges be “just and reasonable.” Section 740 specifically grants the Commission authority to fund research, and § 740.1 provides guidance on the objectives that “each project should also support.”

It is also notable that the statutory language itself recognizes the uncertainty of research. Section 740.1 asks that research projects “offer a reasonable probability of providing benefits to ratepayers” and that “expenditures on projects which have a low probability of success should be minimized.”

This language of the statute calls for the Commission to exercise a balanced judgment. The statutory language neither forbids nor requires the funding of research; the language sets no rigid requirements that a research project must meet.

The review of the Commission's statutory authority and past Commission decisions make clear that while the Commission has always exercised strict control over gross expenditures and ratemaking treatment that recovers the costs of a research project, it has varied greatly in the level of scrutiny it has given to specific research projects.

During many years, the Commission approved "EPRI dues," granting much discretion to this organization. More recently, pursuant to legislation, the Commission has funded research but the CEC exercised oversight concerning the major research projects, which it conducted through its PIER program. The PIER program, until its expiration, received \$62,500,000 per year from ratepayers pursuant to § 399.8, but it was the CEC that provided the oversight.

In reviewing this history of the Commission's funding of research, it is clear that the Commission can fund beneficial research without the elaborate governance and oversight that the parties have proposed in this application. At its heart, the relationship between PG&E, SCE, SDG&E and LLNL is not that different from that between the electric companies and EPRI, an organization that conducted research on behalf of electric companies, who paid dues and benefited from the results of the research. The CRADA, however, makes it possible for both the utilities and the Commission, through an advice letter review of the CRADA and proposed research projects, to exercise more oversight over this research than the research conducted by EPRI.

The central issues before us are whether the research program, as proposed or as modified pursuant to Commission direction, sets clear requirements concerning the 1) policies and criteria guiding the research program, 2) the funding levels and 3) ratemaking treatment. If these requirements are clear, then the three utilities and LLNL can write a CRADA

that the Commission can review via an advice letter to ensure that ratepayers will benefit from its terms.

In reviewing the CES-21, both the funding (item 2) and the ratemaking treatment (item 3) are clear and a Commission decision approving these proposals provides direction to all three utilities concerning how to draft a conforming CRADA.

The critical issue that remains is whether Commission can set policies and criteria guiding the development of a CRADA and research projects conducted pursuant to the CRADA that would permit the Commission to determine that the CES-21 program meets the statutory requirements and guidelines pertaining to research through an advice letter review.

Before moving on, it is important to note that to the extent that the Commission itself reviews the CRADA and research projects through an advice letter process, as proposed in this decision, then the objections raised by TURN and DRA concerning “unlawful delegation” become moot. In an advice letter review process, the Commission does not delegate to an external entity the authority to approve either the terms of the CRADA or the portfolio of research projects. Instead, the Commission takes action to approve or reject the CRADA and proposed research.

5.2. Is the Proposed Project Reasonable? Should it be Modified in Any Way?

As discussed in the previous section, this decision must determine whether the Commission can set areas of research and set policies to guide the writing of the CRADA and guide the selection of research projects included in it. Specifically, can the Commission set contract requirements that assure that the

CRADA and CES-21 projects are consistent with the guidelines set forth in § 740.1.

The Commission must also determine the reasonableness of the proposed funding levels and the reasonableness of the proposed changes in rates that will finance the research. If these conditions are all met, it will be lawful to fund the program and to delegate its administration.

5.2.1. Positions of Parties

TURN and DRA argue that the CES-21 project is deficient on numerous grounds.

TURN argues that the Joint Utilities “provided no detailed breakdown of the estimated spending, and no meaningful forecast of project costs that might permit the Commission to assess the reasonableness of the requested funding level.”⁹⁹ In particular, TURN argues that the “maximum funding level that the utilities have agreed to with LLNL is very different than a forecast of reasonable costs that the utilities might incur for the CES-21 Project.”¹⁰⁰ TURN argues further that:

Nowhere in the testimony do the utilities address, much less explain, how they reached this determination or why the Commission should find the resulting figure reasonable.¹⁰¹

In a separate argument, TURN argues that the Joint Applicants “present no detail about internal utility administrative costs.”¹⁰²

⁹⁹ TURN Opening Brief at 4.

¹⁰⁰ *Id.* at 4.

¹⁰¹ *Id.* at 5.

¹⁰² *Id.* at 5.

TURN also argues against the choice of LLNL, stating that the Joint Utilities “failed to assess, much less explain, the reasonableness of treating LLNL as a ‘sole source’ provider.”¹⁰³ In contrast, TURN argues that the utilities should have taken a different approach, stating:

Competitive solicitations are an important way to ensure that contracts for services are reasonable.¹⁰⁴

TURN concludes that “the level of due diligence the utilities performed here is not sufficient to warrant approval of the \$150 million of ratepayer funds.”¹⁰⁵

TURN further argues that the “Joint Utilities failed to present any projects in sufficient detail to permit the Commission to assess the reasonableness of the proposed funding level.”¹⁰⁶ TURN states:

The Joint Utilities fail to present any actual proposed projects that they might pursue through the CES-21 Project. Instead, the application and testimony merely describe “main areas” for projects – Cyber Security, Electric Resource Planning, and Electric and Gas System Operations – with “illustrative examples” of project activities that may (or may not) be undertaken and hypothesized benefits that may (or may not) occur.¹⁰⁷

TURN also argues that in addition to failing to present detailed projects, the “Joint Utilities fail to present an adequate showing on the potential benefits of cost-benefit analysis that might enable determining if the proposed costs are

¹⁰³ *Id.* at 6.

¹⁰⁴ *Id.* at 6.

¹⁰⁵ *Id.* at 10.

¹⁰⁶ *Id.* at 10.

¹⁰⁷ *Id.* at 10.

reasonable.”¹⁰⁸ TURN argues that the approach that the Joint Applicants propose does not compare with “the analysis presented in other applications seeking to establish a reasonable probability of benefiting customers” such as PG&E’s Compressed Air Energy Storage.”¹⁰⁹ In addition, TURN argues that the “calculations that accompany the Joint Utilities’ ‘illustrative’ examples do not provide the Commission with a basis for finding the CES-21 Project has a reasonable probability of benefiting customers.”¹¹⁰

TURN therefore concludes that the utilities have “failed to provide the Commission with sufficient information to support a finding that spending up to \$150 million of this effort would result in utility rates that are ‘just and reasonable’”¹¹¹

DRA analyzes the CES-21 project against § 740.1 and argues that “the amended application fails to provide sufficient information for the Commission to find any reasonable probability of a benefit to ratepayers.”¹¹² Specifically, DRA argues that:

The amended application does not provide a basis for allocating \$150 million in ratepayer funds to LLNL which results in the entire application having a low probability of success. The request fails to explain how it would be consistent with the IOUs’ resource plan. While the IOUs do present illustrative cases (that appear duplicative with other ongoing research) DRA noted in its Protest on November 2, 2011, that the “applicants fail to define

¹⁰⁸ *Id.* at 11.

¹⁰⁹ *Id.* at 14.

¹¹⁰ *Id.* at 15.

¹¹¹ *Id.* at 17.

¹¹² DRA Opening Brief at 3.

deliverables, timing, milestones, decision-making authority and structures to ensure quality control and accountability, or any detailed information on costs. And the applicants failed to provide any of the supplemental information requested by the ALJ and the assigned Commissioner.” Though the IOUs attempt to fit their ideas into the objectives required under PU Code § 740.1(e), the blank check requested by the IOUs would not limit their research to those objectives.¹¹³

DRA argues that since the application relies on illustrative cases and not a proposed project, “there is no basis upon which the Commission can find the application presents ‘a reasonable probability of providing benefits to ratepayers.’”¹¹⁴ Furthermore, DRA argues that without “a detailed evaluation the Commission must find that the probability of success is non-existent, and well below that required by statute.”¹¹⁵ Similarly, DRA argues that without a detailed evaluation “the Commission cannot find the speculated research areas to be consistent with the utilities resource plans.”¹¹⁶

DRA argues that without research details, “the utilities are asking for a blank check.”¹¹⁷ DRA also objects to the governance process, arguing that it “allows each utility to act independently of the Board” by declining to participate in a research project.¹¹⁸

¹¹³ *Id.* at 3.

¹¹⁴ *Id.* at 4.

¹¹⁵ *Id.* at 6.

¹¹⁶ *Id.* at 8.

¹¹⁷ *Id.* at 10.

¹¹⁸ *Id.* at 14.

DRA also argues that the Joint Applicants have failed to show that “there is a need for the exceptional high-performance computing capability at LLNL.”¹¹⁹ DRA also claims that “the application does not explain why the research should not be funded through the EPIC program or why the LLNL is the appropriate entity to perform the research.”¹²⁰

DRA alleges that the requested funding “would duplicate the Commission’s initiatives in the LTPP proceeding”¹²¹ and that “the lack of controls or limits on research ... directly conflicts with the Legislative prohibition of funding for climate change research.”¹²²

Finally, DRA argues that the CES-21 would be a “program” and subject to the provisions of P.U. Code Section 326.5.

Concerning CES-21, the Joint Applicants argue that the projected costs are reasonable:

The \$30 million per year costs of CES-21 are reasonable, particularly in light of the Commission’s own findings that energy RD&D funding has fallen steadily since 1978, and that the current funding “gap” for California energy RD&D spending could be as much \$670 million per year. The \$30 million in annual costs are spread across the service areas of all three of the Joint Utilities, further reducing the costs to customers.¹²³

Thus, the Joint Applicants argue the reasonableness of both the level of funding and the proposed mechanism for financing the research proposal.

¹¹⁹ *Id.* at 16.

¹²⁰ *Id.* at 17.

¹²¹ *Id.* at 21.

¹²² *Id.* at 21.

¹²³ Joint Applicants Opening Brief at 2.

The Joint Applicants also argue that the CES-21 project meets the criteria set forth in the § 701.1 guidelines. Specifically, the Joint Applicants note that the proposal avoids duplication, clearly sets the funding amounts and allocation to projects and the funding mechanisms and complies with the principles in § 740.1 and § 8360.

The Joint Applicants argue that the proposed project is beneficial and necessary because:

First, the sheer volume of data the IOUs are confronting is dramatically increasing. For example, just taking into account the IOUs Advanced Metering Infrastructure projects, the amount and quality of granular energy usage data available to be analyzed and used for utility operational improvements and customer-facing energy management programs has increased several orders of magnitude, from 20 million customers with only 12 data points of energy usage per year, to the same number of customers with 35,040 data points per customer per year. Second, as acknowledged by numerous studies and reports on energy and environmental issues in California, the complexity of issues confronted by California energy utilities, customers and policymakers today is also increasing.¹²⁴

In addition, the Joint Applicants argue that the high power computing of LLNL will “reduce the time to run simulations and thus help the IOUs be more responsive to the demands of today’s business and regulators.”¹²⁵ Specifically, they argue that the research will help the Joint Applicants better understand complex issues of grid management and will reduce costs.

¹²⁴ *Id.* at 6-7.

¹²⁵ *Id.* at 7.

Concerning the choice of LLNL, the research partner, the Joint Applicants argue that:

LLNL's capabilities are well-known and globally recognized. LLNL is a premier applied science laboratory within the United States Department of Energy (DOE). Since its founding in 1952, LLNL has consistently provided groundbreaking solutions for its customers in a broad range of national security missions.¹²⁶

The Joint Applicants state that the research program has four elements, "electric resource planning, electric systems operations, gas system operations and cyber-security."¹²⁷ The applicants then describe the current research issues in each area and the goals of the proposed research.

For electric resource planning, the Joint Applicants identify the limitations of current system models and how they fail to reflect the "complexity of the electric grid"¹²⁸ and computational bottlenecks. The Joint Applicants state that an initial goal is to develop "improvements to optimization algorithms and the application of high-performance computing."¹²⁹ The Joint Applicants discuss potential modeling projects, and estimate that refinements in the estimates of "load following requirements" would lead to a benefit of "\$30 million/year."¹³⁰ In addition, by improving the estimate of "resource need for renewable integration," the project would provide a benefit of "\$552 million."¹³¹

¹²⁶ *Id.* at 8.

¹²⁷ *Id.* at 11.

¹²⁸ *Id.* at 11.

¹²⁹ *Id.*

¹³⁰ *Id.* at 14.

¹³¹ *Id.* at 14.

In Reply to the arguments of TURN and DRA, the Joint Applicants argue that:

the scope of the CES-21 RD&D collaboration is innovative and extraordinary, and the governance of the CES-21 program will provide the Commission, utility customers and California policymakers with effective and extensive authority to ensure that CES-21 funding is spent wisely, prudently and for the clear benefit of utility customers and California.¹³²

More specifically, concerning the absence of detail on specific projects and costs, the Joint Applicants respond:

Contrary to TURN and DRA, it [the absence of detail] is a positive virtue, not defect, of CES-21 that the Joint Utilities have provided details in this proceeding on potential and illustrative projects, but have deferred review and final approval of the actual projects to the collaborative and inclusive governing process proposed for CES-21. The whole purpose of CES-21 is to establish an unprecedented, extraordinary energy RD&D collaboration in California, instead of relying on 12-18 month, project-by-project, approvals of RD&D expenditures.¹³³

The Joint Applicants point out that “CES-21 includes formal criteria for approval of specific projects similar to the criteria adopted by the Commission for investment projects under EPIC.”¹³⁴ Specifically, the Joint Applicants argue that:

The CES-21 criteria also meets and exceeds the Section 740.1 criteria, including requirements that CES-21 projects demonstrate

¹³² Joint Applicants Reply Brief at 2.

¹³³ *Id.* at 3.

¹³⁴ *Id.* at 4.

a reasonable probability of success, avoid duplication, and be consistent with the Joint Utilities' resource plans and California energy and environmental goals.¹³⁵

The Joint Applicants point out the review criteria that, when adopted by the Commission, will apply to the business case reviews that the board will require for each project.

The Joint Applicants argue the illustrative use cases provide detail on specific and potential projects and that TURN and DRA fail to discuss the technical details of the projects. The Joint Applicants note that "the ALJ in the hearings engaged the witnesses ... in a discussion of the detailed examples of the specific types of projects they would request for initial consideration and evaluation by the CES-21 board."¹³⁶ The Joint Applicants state that this on-the-record discussion explored how the high-performance computing could be used to improve models of the electric and gas systems and the benefits it would yield.¹³⁷

In reply, the Joint Applicants also argue that LLNL will not be a "sole source" provider of RD&D because the "CES-21 governing board will consider services from RD&D providers other than LLNL."¹³⁸

The Joint Applicants also argue in reply that the CES-21 does not provide a "blank check." The Joint Applicants argue:

¹³⁵ *Id.* at 4, footnote 11.

¹³⁶ *Id.* at 5.

¹³⁷ *Id.* at 6-9.

¹³⁸ *Id.* at 10.

... the CES-21 governance process actually provides the Commission with a greater, more direct oversight role than it has played in the past on utility RD&D expenditures. In both the EPIC proceeding and in the utilities' General Rate Cases, the Commission has approved budgets for energy RD&D that are subject to broad guidance and principles on utility-funded RD&D programs, while leaving the project-by-project decisions and expenditures to the individual utilities or providers (such as the Energy Commission).¹³⁹

In addition, the Joint Applicants argue:

The reality is that, vote or no vote [on the governing board], the Commission will have a "de facto" veto over CES-21 decisions and expenditures, because it always retains the ability to audit, investigate or directly modify the utilities' rates and funding for CES-21.¹⁴⁰

Finally, the Joint Applicants argue that the AB 1338 does not prohibit the funding of research and that "the scope of the RD&D proposed for CES-21 does not include 'climate change research,' and so the prohibition in AB 1338 is inapplicable to CES-21 on its facts."¹⁴¹

5.2.2. Discussion: With Amendments, the CES-21 Research Project is Beneficial to Customers, and Reasonable to Fund; Tier 1 Advice Letters Enable the Commission to Ensure Beneficial Results

The evidence provided in the record of this proceeding makes clear that the CES-21 research project will likely provide substantial benefits to California ratepayers including economic savings, improved safety and operational

¹³⁹ *Id.* at 12-13.

¹⁴⁰ *Id.* at 13.

¹⁴¹ *Id.* at 18.

reliability, and improved cyber security practices that with both improve operational security and the protection of privacy. In addition, the CES-21 project, when viewed as an application seeking authority to enter into a CRADA with LLNL, is both consistent with law and past Commission practices. Following the procedures used by the Commission in past proceedings,¹⁴² this decision adopts guidelines to shape the CRADA and criteria that staff can use to determine whether proposed research projects warrant approval.

5.2.2.1. CRADA Guideline 1: The CRADA Should Restrict Research Projects to Four Promising Areas

The evidence presented in this proceeding demonstrates that a CES-21 research project, if limited to the areas of cyber security, electric resource planning, and electric and gas system operations, would likely provide substantial benefits to California ratepayers.

Concerning gas operations and the modeling of transmission and distribution, the cross-examination of utility Witness Wong made clear that the current process for modeling the gas system is very limited. In particular, it requires that the analyst input valve settings to model system flows because the model lacked the ability to model and optimize operations over the range of valve settings.

ALJ SULLIVAN: From what you are saying is that the algorithm that you use cannot choose the optimal setting by itself. So you just -- so what you do is you choose one feasible setting and then change the settings around?

¹⁴² In particular, see D.93-02-013, which was discussed above and used in General Order 96-B to model issues appropriate for a Tier 1 Advice Letter.

WITNESS WONG: That's correct.

ALJ SULLIVAN: That sounds pretty limited to me.

WITNESS WONG: The optimization routine we use has limitations, kind of like you mentioned. So we do have to -- try settings on your own, try different settings on our own.¹⁴³

Further questioning sought to explore the number of valve settings that a complete modeling of gas operations would require.

ALJ SULLIVAN: I assume it is a factorial type of analysis?

WITNESS WONG: Yes.

ALJ SULLIVAN: And so how many valves, and what are the number of potential? I mean are we talking millions?

WITNESS WONG: Well, for the number of valves for example on our backbone system, we have cross ties between our main backbone lines. If you want to try different combinations of those cross ties, I would say we probably have 10 to 20 on our system. If you want to try every combination of those, I believe it is 2 to the 10.

"2 to the 10" is 1024, so there would be over 1000 computer runs to perform to ensure that the optimal valve settings on the backbone transmission system.

Upon further cross-examination Witness Wong testified that with a more comprehensive model and with faster computing, gas operations could improve in several ways: 1) less gas would be needed to maintain flow pressures, and

¹⁴³ TR at 179.

this would be both safer and more efficient;¹⁴⁴ 2) it would be easier to detect leaks;¹⁴⁵ 3) estimates on the miles of pipes needed to meet a need would improve.¹⁴⁶

In addition, as noted previously, cross examination of the LLNL witness made it clear that advanced computing will enable gas operations to model “how different flow control devices turn on and off and how that might affect pressure within the lines” and will “interrogate the physics” to determine “what does it take for a pipe to break as a function of, say, the soil it’s in.”¹⁴⁷

The Joint Applicants in their opening brief argued that a one percent improvement in gas modeling efficiencies would save \$1.75 million per year, or \$8.75 million over five years, as well as improve safety, which was not given a dollar value.

The area of electric resource planning was also revealed as one in which improved modeling would provide substantial monetary savings. As with the gas, cross-examination by the ALJ determined that current electric resource planning lacks “an algorithm that can optimize over so many variables”¹⁴⁸ and that currently it takes “a day” to run a model simulation.¹⁴⁹ The witness testified that the CES-21 could save \$30 million per year in reduced load following costs

¹⁴⁴ TR at 242.

¹⁴⁵ TR at 243.

¹⁴⁶ TR at 187-188.

¹⁴⁷ TR at 124.

¹⁴⁸ Joint Applicants Reply Brief at 7.

¹⁴⁹ *Id.* at 8.

and \$552 million in reduced resources needed to integrate renewable resources.¹⁵⁰

In the area of electric system operations, the data generated by Smart Meters can improve distribution planning and the integration of renewables. The vast quantities of data, however, have a real impact on utility planning, and the witness from LLNL made clear the implications of the explosive increase in data generated by Smart Meters:

ALJ SULLIVANCould this be done outside of -- is it possible to do this outside of a high-performance computing lab, or just not really -- just so operationally too slow?

WITNESS DR. FRIEDMANN: The 20 million smart meters in the State of California in 2014 will generate about 3 terabytes of data a day, which is about a Library of Congress worth of data every day. You simply need a very large computing capability both in terms of speed and bandwidth to be able to handle that. To my knowledge there are not other computational resources in the state that can actually manage that.¹⁵¹

In the area of cyber security, a utility witness testified to the benefits that would likely arise from collaboration with LLNL:

WITNESS MIKOVITZ: And so when I heard about Lawrence Livermore's capabilities and especially the work that they had done on simulating nuclear weapons testing results, that was incredibly compelling to me personally. It was compelling because on one hand, the need for sensitivity in a national security context told me that they were the kind of partner that would make sense.

¹⁵⁰ Joint Applicants Opening Brief at 14.

¹⁵¹ TR at 130.

The second thing that was compelling to me is in talking to my colleagues, it appears at the other IOUs --we all recognize that there were long-term challenges that were going to be difficult to deal with at scale. And so computer simulations in terms of understanding those problems and understanding ways of potentially solving those became very compelling. That's why we used a use case in the application that was basically centered about threat -- threat modeling.¹⁵²

The witness testified how these capabilities could be used to improve security throughout utility operations:

WITNESS MIKOVITZ: What would be different about that project is -- about the potential types of research projects that this program funding approach would open up the opportunity for is the ability to model in -- in the -- simulate, if you will, our technical environment and understand which areas of weaknesses are most likely to have the most significant negative impacts to reliability, to customer service, to operational capabilities, and, therefore, further optimize our focus on a -- we're always going to have a finite set of resources and we always want to be focusing our finite set of resources on the things that are most valuable.¹⁵³

With these illustrative examples, the record makes clear that research projects that exploit the advanced computing and security capabilities of LLNL in the areas of Cyber Security, Electric Resource Planning and Electric System Operations, and Gas System Operations are highly likely to produce substantial benefits to ratepayers. Thus, research projects limited to these areas will be consistent with the guideline contained in § 740.1(a).

¹⁵² TR at 245-246.

¹⁵³ TR at 247-248.

In addition, since projects limited to these four areas are most likely to be successful, this limitation will minimize expenditures on projects with a low probability of success.¹⁵⁴ As a result, research projects limited to these areas will be consistent with the guideline contained in § 740.1(b).

Projects limited to these four areas are consistent with the corporation's resource plan¹⁵⁵ since they all support basic company operations in transmission, distribution, electric grid planning and/or security.

Projects in these four areas are highly likely to improve operating efficiency and reliability because the typical use of optimization techniques is to improve operating efficiencies and to improve reliability by identifying weaknesses in electric and gas distribution systems, by more accurately modeling electricity resource needs, and by improving cyber security practices.¹⁵⁶

For this reason, the Commission adopts as a requirement for CES-21 that the CRADA must limit research projects to the areas of Cyber Security, Electric Resource Planning and Electric System Operations and Gas System Operations

5.2.2.2. CRADA Guideline Two: The CRADA Shall Limit Yearly and Total Expenditures

The decision finds that the \$150 million -- \$152.19 million including Franchise Fees and Uncollectibles -- is a reasonable level for five-year funding because this level of funding provides for long-term, sustainable and stable funding for the research and other activities conducted under the project during its five years. In addition, the \$150 million in research costs is dwarfed by the

¹⁵⁴ See § 740.1(b).

¹⁵⁵ See § 740.1(c).

¹⁵⁶ See § 740.1(e)(5).

potential economic benefits that will likely exceed \$500 million.¹⁵⁷ Moreover, the selection criteria for projects ensure that the projected benefits of specific projects will exceed the research costs for each of the funded benefits.

In addition, it is reasonable to limit the expenditure of funds in any one year to \$30 million, as proposed by the Joint Applicants. When this is done, the CRADA will provide a stable source of funding for a five-year period.

5.2.2.3. CRADA Guideline Three: Implementing Advice Letters Shall Allocate and Recover Costs Consistent with the Cost Allocation and Recovery Proposals

It is also reasonable to allocate the funding of the projects as proposed among PG&E, SCE, and SDG&E, with PG&E responsible for 55% of the costs, SCE responsible for 35% of the costs, and SDG&E responsible for 10% of the costs. Concerning ratemaking treatment for PG&E, since the projects will include both electric and gas operations, it is reasonable to allocate 75% of PG&E's costs to electric distribution and recover the costs through the Distribution Revenue Adjustment Mechanism. Gas revenue requirements can reasonably be recovered through the Core Fixed Cost Account for core gas customers and the Noncore Customer Class Charge Account for noncore customers.

Concerning ratemaking treatment for SCE, it is reasonable for SCE to recover its CES-21 costs through the Base Revenue Requirement Balancing

¹⁵⁷ Joint Applicants Opening Brief at 14 shows that improving the estimate of resources needed for renewable integration can reduce the need for gas fired capacity by \$552 million alone.

Account, and SCE may book its CES-21 costs into that account for recovery in rates.

SDG&E proposes to open a balancing account to record the difference between its share of the program expenses, as described in the section on SDG&E's CES-21 Revenue Requirements in Exhibit U-1, up to the maximum, and its annual revenue requirement. The ultimate disposition of this account would be addressed at SDG&E's annual Electric Regulatory Account Balance Update filing or other applicable proceeding, to be collected from electric distribution customers. This proposed ratemaking treatment for the recovery of SDG&E's CES-21 costs is reasonable.

5.2.2.4. CRADA Guideline Four: Research Projects Conducted Under the CRADA Must Meet Specific Criteria

Because of the nature of the proposed research and because of the evolving nature of generation, transmission and communications technologies and issues, it would be unreasonable to require a detailed description of proposed projects at this time. When questioned on this point, the witness from LLNL stated:

DR. FRIEDMANN: If I can speak to that a little bit. We have continued to work with the technical teams at the IOUs to understand more richly what their business needs are so that we can come up with projects that look viable. One of the things we have learned in the past two years is what was highest priority two years ago is not necessarily the highest priority now. That is part of the basis by which we provided illustrative cases in our application. We didn't want to converge quickly on an answer which in two years was no longer the important question. So we wanted to remain flexible across a wide set of potential solutions. But in call [sic] cases, like the one we just went through now [with] you, [we] would

want to understand what the need is, what the deliverables are and what milestones you need to get there.¹⁵⁸

The Joint Applicants point out that, as proposed, the Board of Directors will review projects and as part of the approval process will map planned investments to the electric system value chain, allocate funds from the overall amount approved to specific projects, analyze the justifications for funding the proposed project, and review the project to ensure that it avoids duplication of research. The Board of Directors will also assess the projects' predicted and actual performance against costs and benefits to ratepayers and to the state, including energy cost savings, economic benefits, and environmental benefits.¹⁵⁹

5.2.2.5. Project Criterion 1: Research must not exceed \$30 million in any year

It is reasonable to require that the research projects conducted under CRADA in any given year shall not exceed \$30 million.

Our review of the record in this proceeding leads us to conclude that the proposed \$30 million of annual funding for five years is reasonable in light of the Commission's findings that energy RD&D funding has fallen steadily since 1978 and that the current funding gap for California energy RD&D could be as much as \$670 million per year.¹⁶⁰

¹⁵⁸ TR at 129.

¹⁵⁹ Joint Applicants Opening Brief at 203.

¹⁶⁰ *Electric Program Investment Charge, Staff Proposal*, February 10, 2012, Rulemaking (R.) 11-10-003, at 9- 10, 17; D.12- 05-037, *Phase 2 Decision Establishing Purposes and Governance for Electric Program Investment Charge and Establishing Funding Collections for 2013- 2020*, May 24, 2012, at 6.

5.2.2.6. Project Criterion 2: Research must fall into the four approved areas

In addition, each research project conducted under the CRADA should demonstrate that it falls into one of the four areas approved for research. In addition to being a “guideline” for the writing of the CRADA, the restriction of research to the four areas (gas operations, electric operations, electric resource planning and cyber security) is a criterion that each research proposal must meet.

5.2.2.7. Project Criterion 3: Research Proposals Must Have Support of Majority of Board of Directors and Provide an Explanation if Not Funded by All Utilities

This decision envisions a research program guided by the CES-21 Board of Directors, with their judgment subject to the review of the Commission. For this reason, all advice letters seeking approval of proposed research projects should report the vote of the CES-21 Board of Directors to the Commission. The Commission will review the advice letter filing and will only approve projects that have the support of a majority of the Board.

In addition, if one or more utility declines to support the financing of the project, the advice letter should explain the reason. If the reason for declining to support a research project is that the research is on a matter that falls outside the utility’s operations, then Commission staff may still approve the advice letter ministerially. For example, if an electric only utility declines to support a research project pertaining to gas operations, staff may still approve the research project. In the event that a research project does not have the financing of all utilities with similar operations, then the advice letter proposing such research will require a Commission resolution. This approach is reasonable because our

purpose is to fund research projects that produce customer benefits for the California customers of all the utilities participating in the CES-21 program.

5.2.2.8. Project Criterion 4: The Business Case analysis for a proposed research shall demonstrate the projected benefits exceed projected costs and the research is not duplicative

The decision requires the preparation of a “business case” for each research project. The “business case” shall demonstrate, among other things, that benefits to ratepayers exceed costs to ratepayers and demonstrate that the research does not duplicate other research conducted by the utilities.

In making the assessment of costs and benefits, all costs and economic benefits (such as cost savings) should be discounted to a net present value following standard procedures used by the Commission (for example, such as those used to calculate the Market Price Referent).

If a research proposal produces benefits that are not economic, such as improvements in safety, reliability, or cyber security, staff shall not reject such a Tier 1 advice letter filing, but if there is no Commission-accepted methodology for monetizing benefits, then Commission staff should propose a resolution for Commission action. This decision takes this approach because the Commission wishes to encourage research on safety, reliability and cyber security, as well as on cost savings and therefore this decision rejects an approach that would create a higher procedural hurdle for this type of research. Nevertheless, it is likely that projects producing cyber security, safety and reliability benefits may not permit a straightforward administrative evaluation.

As discussed in the application, the business case will also include information on research milestones, project timelines, administrative structure, and anticipated products.

Concerning a showing that the proposed research does not duplicate other research efforts, the advice letter should demonstrate that the proposed research does not duplicate research being conducted elsewhere by California utilities, by EPRI, by the CEC and by the DOE.

5.2.3. The Commission Will Review CRADA and Proposed Research Projects Each Year via a Tier 1 Advice Letter

To ensure that these policies are followed in both the drafting of the CRADA and in the selection of research projects, this decision requires that the Joint Applicants file the CRADA and the initial research projects with the Commission as a Tier 1 advice letter.

The Commission will review the CRADA to determine its consistency with the guidelines and criteria adopted in this decision. For each subsequent year, the Joint Applicants should file a Tier 1 advice letter with the projects that will be conducted under the CRADA in the upcoming year. As was done in the first year, the Commission will review the CRADA and the projects to determine its consistency with the guidelines adopted in this decision.

The Joint Applicants note that under the proposed CRADA, a research project can be terminated upon a 30-day notice. If the advice letter review results in a Commission resolution rejecting a proposed research project, then ratepayer funding for that project shall cease within 30 days. If the advice letter is, however, delayed, then expenditures on projects approved in a prior year may

continue as long as the expenditures are consistent with the budget included in the prior advice letter filing.

5.2.4. Since the Commission Reviews Projects in Advice Letter Filings, Direct Commission Participation on CES-21 Board is Not Needed

Since the CRADA is a proposed research project and the contract is not dissimilar to other research projects conducted in the past by research groups working for the utilities, this decision sees no need for Commission participation in a governance structure, modeled on EPIC, as the applicants propose (and which TURN and DRA contend raises an issue of unlawful delegation). The CES-21 is not a Commission-initiated project like EPIC. The governance structure of EPIC was developed to provide oversight for *Commission-initiated* project. This research project is a *utility-initiated* project such as those commonly reviewed by the Commission through decisions and advice letters. Therefore, a governance structure modeled on EPIC is not needed.

The Commission, however, should create a liaison to the CES-21 Board to ensure smooth interaction between the research project and Commission reviewers. This decision therefore orders that the Director of the Commission's Energy Division or the Director's designee shall serve as a liaison to the Board of Directors. Although the liaison will not vote or be a member of the Board of Directors, the liaison can communicate Commission concerns to the Board, particularly those concerns pertaining to the information that the Commission needs to conduct a timely review of the annual advice letters.

5.2.4.1. CRADA Guideline Five: Governing Board of Directors Shall Number Six with Three Members Chosen From Academia or Research Institutes

Concerning the governance structure of the Board of Directors for CES-21, this decision finds it reasonable to expand and modify the Board of Directors to insure participation at the governance level by those involved in research as conducted by universities and research institutes. The decision therefore requires six directors, consisting of three directors, one chosen by each of PG&E, SCE, and SDG&E, and three directors, chosen by the utilities, who have experience in research institutes or academic departments relevant to the research proposals. This decision finds that the expansion of the Board of Directors is warranted by the more basic nature of the research proposed in this project. Research as proposed in the CES-21 falls outside the “applied research” that utilities have more commonly conducted and the Commission has more commonly funded. In light of these factors, this decision finds that it is prudent to increase the number of directors with experience in either research institutes or academic research tied to the four areas chosen for CES-21 projects.

5.3. If Modified to Be Consistent with Adopted Policies then CRADA and the CES-21 Program Should Be Authorized

As a result of these actions, this decision has set the policies to guide the writing of a CRADA contract for the CES-21 program, determined a reasonable level of funding for the CES-21 project, and determined a reasonable way to allocate the costs over the three utilities and set regulatory mechanisms for recovering costs.

The initial CRADA contract will be reviewed through the filing of a Tier 1 advice letter to ensure that it meets the guidelines adopted in this decision. In

addition, the Joint Applicants will file annually an advice letter to demonstrate that the projects to be undertaken or continued in the next year under the CRADA meet the guidelines adopted in this decision. In summary, the proposed CES-21 project will likely provide benefits to ratepayers that exceed its costs. It is reasonable to restrict the research projects to four areas: Electric Operations, Gas Operations, Electric Resource Planning, and Cyber security.

This decision has also adopted policy criteria to guide the CES-21 Board of Directors in its review of projects and required an annual advice letter filing by Joint Applicants to enable Commission review of proposed research activities. In addition, the decision changed the composition of the board, increasing the number of board members to six and requiring the appointment of three board members with experience in research institutes or academic research, in addition to three members, one chosen by each utility. The decision also limited the funding for CES-21 to \$30 million per year for five years, allocated the cost responsibility to each utility and adopted a procedure whereby the utility could recover the costs in rates. Furthermore, the Commission grants the Joint Applicants the authority to recover the costs of the CES-21 project for each year of the research upon the effectiveness of the advice letters demonstrating that the CRADA and the research conforms to the guidelines adopted in this decision. If a multi-year research project was approved in a prior advice letter and the project remains unchanged, then the funding of that approved research project can continue pending resolution of the new advice letter. No new research projects, however, should be initiated prior to Commission resolution of the advice letter (either through staff disposition or via a resolution voted at a Commission meeting).

In addition, the CES-21 governance process shall require that meetings of the Board of Directors be open to the public and subject to public access in the same way as meetings of other California public agencies, as proposed in the application. Prior to expending any funds authorized by this decision, the Joint Applicants and LLNL will negotiate and enter into a CRADA consistent with the terms authorized in this decision. This CRADA shall be subject to approval by the Board of Directors for the CES-21 and subject to Commission review for compliance with this decision via a Tier 1 Advice Letter filed by Joint Applicants.

The Commission recognizes that the services provided by LLNL under the CRADA, which will be a five-year agreement, will be subject to the standards set under the CRADA and U.S. DOE regulations for CRADAs, including the right of the Joint Utilities and the Board of Directors of CES-21 to perform audits of LLNL's performance and to withhold payments for non-performance or default on a specific work order, as provided under CRADA regulations.

Also, as proposed by the Joint Applicants, the CES-21 Board of Directors will approve the scope of work and administration of the specific research projects funded by CES-21 and shall ensure that the work comports with the policies set in this decision. As noted above, the Joint Applicants shall file the proposed scope of work each year as a Tier 1 advice letter for review by the Commission against the guidelines adopted in this decision.

The Board of Directors also will have the authority to select an executive director and staff recommended by LLNL to manage the project activities, and may appoint such technical and advisory committees as it deems appropriate to assist in the project activities. In addition, as proposed by the Joint Applicants, the Board of Directors will approve a strategic plan, annual budgets, and allocation of staff and other resources to provide services under individual work

orders requested by each utility (or jointly) and the proportional share of funding set forth in the Proposal. These shall be provided to the Commission on an informational basis.

The Board of Directors will not have the authority to approve any new commitments or expenditures extending beyond the five-year term of the CRADA, or beyond the authority granted in this Application. All funding of projects to support the work orders, including procurement of equipment, facilities, tools, computer software and hardware, will be subject to approval by the Board of Directors.

The Board of Directors shall provide an annual report to the Commission's Executive Director. The annual report should provide a detailed account of expenditures over the last year, the results of the research, the steps taken to involve academics or third parties in the research. In addition, the report should highlight the intellectual property, copyrights or patents, that have resulted from the research.

6. Other Objections to the CES-21 Project

In addition to objections to the reasonableness and lawfulness of the CES-21 Project discussed above, TURN and DRA also raised other objections that warrant discussion.

TURN argues against the choice of LLNL and asks for a competitive solicitation for the contract.

This argument is not persuasive. In particular, it treats an effort to initiate research as if research were little more than an effort to purchase the standard products or services offered by many companies. A research project, to succeed, must be built upon a collaborative effort matching the needs of the funders with the capabilities and interests of those conducting research. As the evidence in

the record makes clear, the current proposal represents substantial efforts on the part of the Joint Applicants and LLNL in this regard.

In addition, the Joint Applicants provide testimony concerning the unique resources, expertise and qualifications of the research personnel associated with LLNL.¹⁶¹ Such unique capabilities and their unique uses in this proposed research make the objection to the choice of LLNL and the request of a “competitive solicitation” unpersuasive.

TURN also objected to the applications use of “illustrative examples” rather than specific and detailed projects, arguing that this approach fails to enable the Commission to determine “if the proposed costs are reasonable.”¹⁶²

As noted above, the nature of basic research and the changing nature of energy priorities make the use and reliance on the “illustrative examples” a reasonable way to proceed. This decision uses these illustrative examples to set policy direction, limiting the research to the four policy areas for which the illustrative examples indicate will produce research leading to benefits. In addition, the decision requires that the Board review projects to ensure that the “business case” for each research project produces benefits for ratepayers and assesses specific projects against the guidelines in § 704.1. Moreover, the Commission’s review of the Joint Applicants’ annual advice letter filings, which will include details on each project and its projected benefits, enables the Commission to ensure that administrators follow the guidance given. In addition, the Commission’s review of the Board of Director’s annual report

¹⁶¹ Ex. U-3 at 2-1 to 2-8.

¹⁶² TURN Opening Brief at 11.

provides another opportunity for the Commission to monitor compliance with this decision.

DRA also objected to the applicants' failure "to define deliverables, timing, milestones, decision-making authority and structures to ensure quality control and accountability, or any detailed information on costs."¹⁶³

This comment indicates a misunderstanding of the nature of the research project. At this preliminary stage, it is not possible to define deliverables, timing and milestones. Moreover, pursuant to the guidance given to the Board of Directors, the Commission will receive both the "business case" analysis presented to the Board of Directors and forwarded to the Commission as part of the Board's Annual Report. This analysis should provide the information that DRA desires. This analysis will provide the Commission with a basis for ensuring that the CES-21 project will follow the policies requiring the funding of only productive research projects.

DRA also specifically objected to the need for "the exceptional high-performance computing capability at LLNL."¹⁶⁴ In response, the record of the proceeding is clear that these capabilities are needed both to model gas and electric operations, optimize the integration of intermittent renewables into the grid, improve load management, and to handle the three terabytes of data generated daily by the Smart Meters.

Finally, DRA's argument that CES-21 is a "program" and subject to the provisions of § 326.5 is not an issue that the Commission need address in this

¹⁶³ DRA Opening Brief at 3.

¹⁶⁴ *Id.* at 16.

decision. Section 326.5 imposes reporting requirements on the *Commission*, not on project applicants. For that reason, there is nothing that the Commission need order the applicants to do at this time.

7. Outstanding Motions

7.1. Motion for Recusal

As mentioned in the background of this proceeding, on March 22, 2012, TURN filed a motion in the above captioned proceeding seeking the recusal of assigned Commissioner Peevey with a number of emails attached to support its claim. TURN argues that documented communications between the President's office and stakeholders, including the applicants, prior to the filing of the application creates a situation where President Peevey cannot be an impartial decision-maker.

The Commission has reviewed the information presented by TURN and finds that the arguments made by TURN are unpersuasive and the conclusions reached by TURN have no basis in fact.

None of the emails TURN provided show a prejudgment or bias whatsoever with regards to the outcome of this proceeding. At most they signify a Commissioner's desire to see a utility proposal regarding the advancement of energy efficiency and other previously adopted state-wide policy goals. As such, they are consistent with the responsible fulfillment of a Commissioner's constitution duties.

The law pertaining to the issues raised by TURN is clear. Decision makers at administrative agencies are accorded a presumption of impartiality.¹⁶⁵ In ratesetting proceedings such as the instant case, a decision-maker may be disqualified, “only when there has been a clear and convincing showing that the agency member has an unalterably closed mind on matters critical to the disposition of the proceeding.”¹⁶⁶ A party seeking to disqualify a decisionmaker on this basis must meet the clear and convincing test in order to rebut the presumption of administrative regularity.¹⁶⁷ TURN has failed this test.

As the Courts have stated, the disqualification of every decisionmaker who held opinions on the appropriate course of future action “would eviscerate the proper evolution of policymaking” and substantially interfere with the development of agency policy.¹⁶⁸ In the present instance, TURN has provided no evidence that President Peevey has anything even close to an unalterably closed mind on the issues in this proceeding. TURN’s evidence shows nothing more than a desire by President Peevey to move forward expeditiously in meeting California’s energy policies.

In certain situations the mere appearance of bias may require disqualification. These situations include a financial or personal interest in the outcome of the proceeding.¹⁶⁹ Personal animosity towards a party or

¹⁶⁵ See *Morongo Band of Mission Indians v. State Water Resources Control Board* (2009) 45 Cal.4th 731,737.

¹⁶⁶ *Association of National Advertisers, Inc. v. Federal Trade Commission* (D.C. Cir. 1979) 627 F.2d 1151, 1170.

¹⁶⁷ D.09-08-028 at.51; see also D.10-05-023 at 4.

¹⁶⁸ *Assoc. of Nat’l Advertisers, Inc. v. Fed. Trade Comm’n* 627 F.2d at 1174.

¹⁶⁹ See *Haas v. County of San Bernardino* (2007) 27 Cal.4th 1017.

embroilment in the dispute also may create an impermissible appearance of bias requiring disqualifications.¹⁷⁰ TURN has failed to show the appearance of bias or actual bias in this case. TURN itself acknowledges that it has no evidence of a financial or pecuniary interest in the proceeding's outcome. Likewise, there is no evidence of personal animosity between President Peevey and any party to this proceeding.

For all these reasons, this decision denies TURN's motion seeking the recusal of assigned Commissioner Peevey.

7.2. Other Motions

Throughout the proceeding, parties made numerous motions pertaining to the conduct of the procedures. Since this decision resolves all outstanding matters before the Commission in this proceeding, any outstanding motion is rendered moot.

8. Conclusion

In summary, the record in this proceeding demonstrates that this collaborative research project involving PG&E, SCE, SDG&E and LLNL is needed and will likely produce benefits that exceed costs. The super computer capabilities of LLNL will enable the development of better models of gas and electric operations, improvements in electric resource planning, improvements in gas systems operations and safety (including the quicker detection of leaks and weak pipes), improvements in cyber security that protect privacy and grid reliability, and the ability to handle the three terabytes of data generated daily by Smart Meters that provide micro-data on demand and grid flows.

¹⁷⁰ See *Stivers v. Pierce* (9th Cir. 1995) 71 F.3d 732.

In light of these facts, funding the CES-21 program is reasonable, and the adopted ratemaking to recover the \$152.19 million cost of the program results in reasonable rates.

The policies adopted in this decision to guide the Board of Directors of the CES-21 project and the advice letter review process established assure that the research projects that emerge in the areas of gas operation, electric operations, cyber security, and electric resources planning will conform with the guidelines in § 740.1.

9. Comments on Proposed Decision

The proposed decision of the ALJ in this matter was mailed to the parties in accordance with Section 311 of the Public Utilities Code and comments were allowed under Rule 14.3 of the Commission's Rules of Practice and Procedure. Comments were filed on ____, and reply comments were filed on ____ by ____.

10. Assignment of Proceeding

Michael R. Peevey is the assigned Commissioner and Timothy J. Sullivan is the assigned ALJ in this proceeding.

Findings of Fact

1. This proceeding commenced on July 18, 2011.
2. Decision 12-05-037, which set procedures for the review of proposed research development and demonstration projects, was issued on May 31, 2012.
3. The CES-21 Project's objective is to apply computationally-based problem solving resources to the emerging challenges of the 21st century energy system of electrical and natural gas for California.
4. The application and testimony provided by the Joint Applicants presented illustrative examples of research in four areas: Gas System Operations, Electric System Operations, Electric Resource Planning and Cyber security.

5. PG&E, SCE, and SDG&E currently use commercial off-the-shelf or in-house developed modeling tools for planning electric systems.
6. The models that PG&E, SCE, and SDG&E use for electric resource planning are computationally intensive yet limited in their ability to represent the complexity of the grid.
7. The CES-21 project will seek to augment the functionality of existing models to better represent the complexity and responsiveness of the grid.
8. If research projects in this area prove successful, the CES-21 could provide benefits of \$30 million per year in reduced load following costs and \$552 in reduced resources by 2020 needed to integrate renewable resources.
9. In the area of electric operations, the enhanced monitoring and control capabilities produced by a successful research project, will help integrate renewable intermittent resources that are critical to meeting California's Renewables Portfolio Standard.
10. In the area of gas operations, the use of supercomputing systems and models will enhance the utilities ability to calculate and anticipate pressure changes on gas pipelines. This knowledge can improve the safety of gas operations.
11. Enhanced monitoring and modeling of gas operations will facilitate leak detection and system safety.
12. Advanced modeling of gas operation could permit gas companies to reduce pressures in the transmission system needed to meet distribution pressure needs, thereby improving transmission system safety and operating efficiencies.

13. Advanced modeling made possible by the CES-21 project could enable researchers to determine what it takes for a pipe to break as a function of soil type and gas pressure.

14. Enhanced modeling of gas flows could result in reduce transmission expenditures. If the expenditures on gas transmission are reduced by just one percent, that will result in a savings of \$1.7 million per year.

15. In the area of cyber security, the CES-21 anticipates that information sharing among PG&E, SCE, SDG&E and LLNL, which has cutting edge experience in cyber security, will enhance the utilities ability to meet cyber security challenges and result in a more reliable grid that can protect customer privacy.

16. In conducting research, discretion is necessary to enable researchers to uncover and pursue areas of research that their initial investigations show are promising and to abandon areas that initial research suggest will not prove productive.

17. The CES-21 research program will likely provide substantial benefits to Californian ratepayers, including economic savings, improved safety and operational reliability and improved operational security and protection of privacy.

18. The current ability of utilities to model gas operations and gas flows is very limited. Current models require the analyst to input valve settings and lack the ability to choose the optimal valve settings.

19. The current backbone of the gas system has over 10 valves and it would take over 1000 runs to optimize valve settings.

20. A more comprehensive and automated model of gas operations could enable a gas utility to use less gas to maintain flow pressures, and this would improve safety and efficiency.

21. A more comprehensive model of gas operations and gas flows would improve a utility's ability to detect leaks.

22. A more accurate model of gas operations and gas flows could improve estimates and thereby reduce the miles of pipes needed to meet a system need.

23. Advanced computing can enable the modeling of pipe breaks and thereby improve safety.

24. Smart meters will generate three terabytes of data a day, about the amount of data now in the Library of Congress.

25. The record in this proceeding identified only one facility with the speed and bandwidth needed to process the data generated by 20 million smart meters, and that was the supercomputing facilities at LLNL.

26. LLNL has developed cyber security procedures to protect the research it conducts on the nuclear weapons program.

27. The CES-21 project would open the opportunity to model the technical environment of utility operations and to improve the understanding the areas of weakness that would have the most significant negative impacts on customer service and operations.

28. The illustrative examples allow us to conclude that research projects limited to gas operations, electric operations, electric resource planning will offer a reasonable probability of providing benefits to ratepayers because the projected benefit exceed projected costs.

29. The illustrative examples allow us to conclude that research projects limited to gas operations, electric operations, electric resource planning will minimize projects which have a low probability for success.

30. The illustrative examples allow us to conclude that research projects limited to gas operations, electric operations, electric resource planning will be consistent with the corporation's resource plan because the research supports current operations, planning, and security.

31. The illustrative examples allow us to conclude that research projects limited to gas operations, electric operations, electric resource planning will improve public and employee safety and improve the operating efficiency and reliability and likely reduce operating costs.

32. Illustrative cases offer a reasonable way of investigating potential research when system priorities and technologies are undergoing rapid changes.

33. It is prudent to develop a business case for each particular research project that 1) maps planned research projects to the energy system value chain, 2) allocates funds from within the overall allocation to specific projects, 3) analyzes the justifications for specific projects against the goals for CES-21 listed in § 740.1, 4) reviews the project to ensure that it does not duplicate other research, and 5) assesses the project's benefits, including safety and environmental benefits, and its costs.

34. It is reasonable to require that the Board of Directors of the CES-21 review a business case for each particular research project.

35. It is reasonable to require that the Joint Applicants submit a Tier 1 advice letter filing seeking approval for the CRADA and for each research project. The advice letter should include the business case justification for each project.

36. It is reasonable to require the advice letter to assess the net present value of the costs and projected benefits of a proposed research project following standard procedures used by the Commission, such as those used to calculate a Market Price Referent.

37. It is reasonable to require that the advice letter seeking approval of a specific research project demonstrate that it is not duplicative of existing research by reviewing research conducted by California utilities, by the California Energy Commission, by EPRI, and by the Department of Energy.

38. It is reasonable to require that the advice letter seeking approval of a specific research project demonstrate that it has the support of the majority of the CES-21 Board of Directors.

39. It is reasonable to require that, if an advice letter proposes a research project that is not funded by all three utilities, it must include an explanation. It is reasonable for staff to approve a research project that lacks the funding support of all participating utilities if the research focuses on a matter that falls outside the utility's operations. For example, an electric utility may not wish to fund research on gas operations.

40. The requirements that limit research to four productive areas and order the board to review the business case for each project and to provide an annual report to the Commission will ensure that all projects funded by the CES-21 program are consistent with the research guidelines set forth in § 740.1.

41. The requirement that the annual report provided to the Executive Director of the Commission by the Board of Directors of the CES-21 provide information on the costs of research, the results of research, the participation of individuals outside of LLNL and the three utilities, and intellectual property that results from the research is reasonable and in the public interest.

42. The requirements that require annual advice letter filings concerning proposed research enable the Commission to ensure that research is limited to the four productive areas approved by the Commission and to ensure that each research has a positive business case.

43. Because of the research that forms the heart of the CES-21 project, it is reasonable that the Board of Directors consist of three directors, one chosen by each of PG&E, SCE, and SDG&E, and three directors chosen by the utilities who have experience in research institutes or academic departments relevant to the research proposals.

44. It is reasonable for the Director of the Energy Division, or the designee of the Director, to serve as a liaison to the CES-21 Board of Directors. The Director of the Energy Division can provide input in advance of advice letter filings concerning the information that the Commission needs to review an advice letter.

45. It is reasonable to limit the duration of the CES-21 program to five years.

46. It is reasonable to limit the overall expenditures on the CES-21 program to \$30 million per year and \$150 million over five years (152.19 including franchise fees and uncollectibles).

47. It is reasonable to allocate the funding of the projects as proposed among PG&E, SCE, and SDG&E, with PG&E responsible for 55% of the costs, SCE responsible for 35% of the costs, and SDG&E responsible for 10% of the costs.

48. It is reasonable that PG&E allocate 75% of its costs to electric distribution and recover these costs through the Distribution Revenue Adjustment Mechanism.

49. It is reasonable that PG&E allocate 25% of its costs to gas revenue requirements, to be recovered through the Core Fixed Cost Account for core gas

customers and the Noncore Customer Class Charge Account for noncore customers

50. It is reasonable for SCE to recover its CES-21 costs through the Base Revenue Requirement Balancing Account, and SCE may book its CES-21 costs into that account for recovery in rates.

51. It is reasonable for SDG&E to open a balancing account to record “the difference between its share of the program expenses, as described in the section on SDG&E’s CES-21 Revenue Requirements in Exhibit U-1, up to the maximum, and its annual revenue requirement. The ultimate disposition of this account would be addressed at SDG&E’s annual Electric Regulatory Account Balance Update filing or other applicable proceeding, to be collected from electric distribution customers.

52. This decision sets the policies to guide the drafting of the CRADA and the selection of research projects to include in a Tier 1 advice letter seeking approval of a specific CRADA and research projects.

Conclusions of Law

1. California state law supports Commission oversight of utility research projects.

2. Section 701 gives the Commission broad authority to supervise and regulate public utilities and to do all things necessary and convenient in the exercise of that power and jurisdiction.

3. Section 451 requires that all charges demanded or received by any public utility for any product or commodity furnished or to be furnished or any service rendered or to be rendered shall be just and reasonable.

4. Section 740 explicitly allows the inclusion of expenses for research and development.

5. Section 740.1 sets forth guidelines for the Commission to consider in evaluating research development and demonstration programs proposed by electrical and gas corporations.

6. Section 399 finds and declares, among other things, that in order to ensure that the citizens of California continue to receive safe, reliable, affordable and environmentally sustainable electric service, it is essential that prudent investments continue to be made to advance public interest RD&D programs not adequately provided by competitive and regulated markets.

7. In D. 11-12-035, the Commission found that for RD&D, §§ 740 and 740.1, added in 1973 and 1984, respectively, together with § 701, provide the Commission with authority to fund research and that these sections of the Pub. Util. Code remain in effect today, without modification since enactment.

8. Since this proceeding commenced before the institution of the EPIC rulemaking, the procedures adopted in that decision for the consideration of proposed research projects in triennial EPIC proceedings do not apply to the research projects proposed in this proceeding.

9. The requirements adopted for the CES-21 program that limit research to four productive areas, require a the business case for each project, require a demonstration that the research is not duplicative, and require an annual advice letter filing ensure that all projects funded by the CES-21 program are consistent with the research guidelines set forth in § 740.1.

10. If the CRADA and the research projects conducted under the CRADA meet the guidelines and criteria set forth in this decision, then the research is in the public interest and consistent with the law.

11. If the CRADA and the research project conducted under the CRADA meet the guidelines and criteria set forth in this decision, and the costs fall within

the \$30 million annual cap, and the ratemaking follows the procedures set forth, then the resulting rates are reasonable.

12. Since this decision adopts explicit guidelines for the drafting of the CRADA and specific criteria that a research proposal must meet, a Tier 1 advice letter process is an appropriate mechanism for exercising Commission oversight.

O R D E R

IT IS ORDERED that:

1. The Joint Application of Pacific Gas and Electric Company, San Diego Gas & Electric Company and Southern California Edison Company to Recover Costs of an Agreement with Lawrence Livermore National Laboratory for 21st Century Energy Systems, a proposed research project, is authorized subject to the conditions set forth in Ordering Paragraphs 2 through 14.

2. The California Energy Systems for the 21st Century Project is authorized for a five-year period and the total costs of the project shall not exceed \$150 million during the five-year period (\$152.19 million including franchise fees and uncollectibles) and shall not exceed \$30 million in any single year.

3. Pacific Gas and Electric Company shall be responsible for 55% of the costs of the 21st Century Energy Systems research project. Pacific Gas and Electric Company is authorized to allocate 75% of these costs to electric distribution and recover these costs through the Distribution Revenue Adjustment Mechanism. Pacific Gas and Electric Company is authorized to allocate the remaining 25% of its costs to gas revenue requirements and recover these costs through the Core Fixed Cost Account (for core gas customers) and the Noncore Customer Class Charge Account (for noncore customers).

4. Southern California Edison Company shall be responsible for 25% of the costs of the 21st Century Energy Systems research project. Southern California Edison Company is authorized to recover these costs through the Base Revenue Requirement Balancing Account and to subsequently recover these costs in rates.

5. San Diego Gas & Electric Company shall be responsible for 10% of the costs of the 21st Century Energy Systems research project. San Diego Gas & Electric Company is authorized to open a balancing account to record the difference between its share of the program expenses, up to the maximum, and its annual revenue requirement. The ultimate disposition of this account shall be addressed at San Diego Gas & Electric Company's annual Electric Regulatory Account Balance Update filing or other applicable proceeding, to be collected from electric distribution customers.

6. The 21st Century Energy Systems research project shall have a six member Board of Directors. The Board of Directors shall consist of three directors, one chosen by each of Pacific Gas and Electric Company, Southern California Edison Company, and San Diego Gas & Electric Company, and three directors, chosen by the utilities, who have experience in research institutes or academic departments relevant to the research proposals. The Director of the Commission's Energy Division or the Director's designee, shall serve as a liaison to the Board of Directors.

7. Meetings of the Board of Directors shall be open to the public and subject to public access in the same way as meetings of other California public agencies, as proposed in the application.

8. Prior to expending any funds authorized by this decision, Pacific Gas and Electric Company, Southern California Edison Company, San Diego Gas & Electric Company and Lawrence Livermore National Laboratory will negotiate

and enter into a Cooperative Research and Development Agreement consistent with the terms authorized in this decision. This Cooperative Research and Development Agreement shall be subject to final approval through a Tier 1 advice letter filed at the Commission.

9. Within 90 days of the adoption of this decision, the Joint Applicants shall file the Cooperative Research and Development Agreement, along with the proposed implementation plan and first year projects, as a Tier 1 advice letter with this Commission. The Commission will review this filing to ensure its consistency with the policy requirements adopted in this decision and enumerated below.

10. The Cooperative Research and Development Agreement and the 21st Century Energy Systems research project shall meet the following guidelines:

- a. The research shall be limited to the areas of cyber security, electricity operations, gas operations, and electric resource planning.
- b. The research shall be limited to \$30 million in a calendar year and be limited to \$150 million during the five years of the project.
- c. The implementing advice letters shall allocate and recover costs consistent with ordering paragraphs 3, 4, and 5.
- d. The Board of Directors shall consist of six members, one designated by each utility, and three members with a background in academic or institutional research selected by the three utilities.

11. The Board of Directors of the 21st Century Energy Systems research project shall administer and implement the policies adopted by the Commission concerning individual research projects.

12. The Joint Applicants shall ensure the preparation and the filing of the annual advice letters. Specifically, the Joint Applicants shall ensure that the annual advice letters demonstrate:

- a. That research projects are limited to the areas of electric system operations, electric resource planning, gas system operations and cyber security which this decision has identified as offering major research opportunities consistent with the needs of ratepayers;
- b. that the total spent on research in a given year in the 21st Century Energy Systems research project does not exceed \$30 million;
- c. that there is a positive business case for each proposed research project. The business case for each new research project proposed that i) demonstrates customer benefits, including safety and environmental benefits exceed costs on a net present value basis, using an Commission approved methodology, such as that used in calculating a Market Price Referent. The business case should also ii) map planned research projects to the energy system value chain, iii) detail the project costs allocates funds from within the overall allocation to each specific project, iv) analyze the justifications for specific projects against the goals in Section 740.1, and v) ensure that the project does not duplicate other research. The purpose of the review of the business case is to ensure that funded projects are beneficial to ratepayers and to facilitate Commission review.
- d. that the research projects do not duplicate other research funded by California utilities, the California Energy Commission, the Electric Power Research Institute, or the United States Department of Energy.
- e. that each proposed research project has the approval of a majority of the Board of Directors of the 21st Century Energy Systems research project.
- f. that, in the event that a research proposal is not funded by all research participants, that the advice letter include a full explanation for consideration by the Commission. If the reason

for declining to support a research project is that the research is on a matter that falls outside the utility's operations, then Commission staff may still approve the advice letter ministerially.

13. In each year of the research project (2013, 2014, 2015, 2016), the Joint Applicants shall file the proposed research projects and budget for the upcoming year as a Tier 1 advice letter with this Commission. With the exception of year 1, that advice letter shall be filed on October 1 preceding the next research year. The Commission will review this filing to ensure its consistency with the policy requirements adopted in this decision and enumerated in ordering paragraph 11.

14. The Board of Directors of the 21st Century Energy Systems research project shall submit an annual report to the Executive Director of the Commission that provides information on the operations of the project, including the research projects funded, the results of the research, the efforts made to involve academics and other third parties, and the intellectual property that results from the research.

15. Application 11-07-008 is closed.

This order is effective today.

Dated _____, at San Francisco, California.