

**BY-LAWS OF BOARD OF DIRECTORS OF
21ST CENTURY ENERGY SYSTEMS AGREEMENT**

AMONG

**LAWRENCE LIVERMORE NATIONAL LABORATORIES, PACIFIC GAS AND
ELECTRIC COMPANY, SOUTHERN CALIFORNIA EDISON COMPANY, AND
SAN DIEGO GAS & ELECTRIC COMPANY**

ARTICLE ONE – NAME

The name of this board of directors shall be **Board of Directors of 21st Century Energy Systems Agreement Among Lawrence Livermore National Laboratories, Pacific Gas and Electric Company, Southern California Edison Company, and San Diego Gas & Electric Company** (“CES 21 Board of Directors”).

ARTICLE TWO – PURPOSE

The purpose of the CES 21 Board of Directors is to administer and implement the policies adopted by the California Public Utilities Commission (“Commission”) in Decision No. 12-12-031 (“Decision”) concerning individual research projects, consistent with the Cooperative Research and Development Agreement (“CRADA”) and other agreements entered into among Lawrence Livermore National Laboratories (“LLNL”), Pacific Gas and Electric Company (“PG&E”), Southern California Edison Company (“SCE”), and San Diego Gas & Electric Company (“SDG&E”) (collectively, “CES-21 Agreement”) and other conditions imposed by the Commission on the research projects approved in the annual Tier 3 advice letter filings made by PG&E, SCE and SDG&E in compliance with the Decision.

ARTICLE THREE – DIRECTORS

Section 1. Powers. Subject to limitations of the Decision, CRADA, CES-21 Agreement and these bylaws, the scope of work and individual research projects of the CES-21 Agreement shall be conducted by or under the direction of the Board. The Board may delegate the management of the activities of the CES-21 Agreement to any person or persons, or committees, however composed, provided that the activities and affairs of the CES-21 Agreement shall be managed and all corporate powers shall be exercised under the ultimate direction of the Board. Without prejudice to such general powers, but subject to the same limitations, it is hereby expressly declared that the Board shall have the following powers in addition to the other powers enumerated in these bylaws:

(a) To review and approve the CRADA, annual Tier 3 advice filing, and individual projects included therein, consistent with the requirements of the Decision.

(b) To select an executive director and staff to manage the project activities, and appoint such technical and advisory committees as it deems appropriate to assist in the project activities.

(c) To 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).

(d) To approve all funding of projects to support the work orders, including procurement of equipment, facilities, tools, computer software and hardware.

(e) To provide an annual report to the Commission's Executive Director. The annual report shall 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.

(f) To advise LLNL, PG&E, SCE and SDG&E on the conduct, results and dissemination of the benefits of individual research projects.

(g) To recommend methods and opportunities for collaboration and coordination on individual research projects among the utilities.

(h) To adopt, amend and repeal the bylaws of the Board of Directors of the CES-21 Agreement.

Section 2. Number of Directors.

(a) The Board of Directors shall consist of six 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. The Director of the Commission's Energy Division or the Director's designee, shall serve as a non-voting liaison to the Board of Directors.

(b) Chairman of the Board; Secretary. The Board by majority vote shall elect a Chairman of the Board, who shall preside over the meetings of the Board; and a Secretary, who shall keep and maintain all minutes and other official documents of the Board.

Section 3. Term of Office. Unless earlier removed as provided hereunder, each director shall hold office for five (5) years, consistent with the term of the CES-21 Agreement and Decision.

Section 4. Vacancies. Any director may resign effective upon giving written notice to the Board, unless the notice specified a later time for the effectiveness of such resignation. If the resignation is effective at a future time, a successor may be selected before such time, to take office when the resignation becomes effective. Vacancies in the Board shall be filled in the same manner as the director(s) whose office is vacant was selected. Each director so selected shall hold office, unless otherwise removed pursuant to Section 5 of this Article V, until the expiration of the term of the replaced director and until a successor has been selected and qualified. A vacancy or vacancies in the Board shall be deemed to exist in case of the death, resignation, or removal of any director.

The Board may declare vacant the office of a director who has been declared of unsound mind by a final order of court, or convicted of a felony, or found by a final order of judgment of any court to have breached any duty listed under Article 3 of Chapter 2 of Part 2 the California

Nonprofit Corporation Law and incorporated herein, including conflict of interest.

Section 5. Removal.

(a) Any director representing a utility on the board may be removed, with or without cause, by the utility that appointed such director. In such a case, such utility shall appoint a successor.

(b) The Board (excluding the director who is subject to the removal action) may remove (i) any director who declines or fails to participate in the Board's discussions on a regular basis, or (ii) any director who the Board (or Board Committee designated by the Board) determines has breached the Corporation's Conflict of Interest Policy or Code of Ethics, each as may be amended from time to time, so long as the Board (or Board Committee designated by the Board) determines that removal is an appropriate consequence of such breach. In such a case, the entity or entities that appointed such director or the Board, as the case may be, shall appoint a successor.

Section 6. Secondary Representative; Additional Representative.

(a) Any director may appoint one secondary representative who shall have the right to vote or take any action in place of the director who appointed such representative in the absence of and at the election of such director but shall not have an additional vote in any Board decision.

(b) All secondary representatives properly appointed pursuant to Section 6(a) shall be considered directors for all purposes.

(c) Each director may appoint one or more additional representative(s) who shall have the right to participate in Board discussions in an advisory and non-voting capacity.

Section 7. Place of Meetings. Meetings of the Board may be held at any place within the State of California that has been designated from time to time by the Board. In the absence of such designation, regular meetings shall be held at the principal executive office of PG&E, SCE or SDG&E.

Section 8. Regular Meetings. Regular meetings of the Board shall be held on such dates and at such times as may be fixed by the Board.

Section 9. Special Meetings. Special meetings of the Board for any purpose or purposes may be called at any time by the Chairman of the Board or any three (3) directors acting together. Special meetings of the Board shall be held upon four (4) days' notice by first-class mail or 48 hours' notice given personally or by telephone, including a voice messaging system or other system of technology designed to record and communicate messages, telegraph, facsimile, electronic mail, or other electronic means. Any such notice shall be addressed or delivered to each director at such director's address as it is shown upon the records of the Corporation by the director for purposes of notice or, if such address is not shown on such records or is not readily ascertainable, at the place in which the meetings of the directors are regularly held.

Notice by mail shall be deemed to have been given at the time a written notice is deposited in the United States mails, postage prepaid. Any other written notice shall be deemed to have been given at the time it is personally delivered to the recipient or is delivered to a common carrier for transmission, or actually transmitted by the person giving the notice by electronic means, to the recipient. Oral notice shall be deemed to have been given at the time it is communicated, in person or by telephone or wireless, to the recipient or to a person at the office of the recipient who the person giving the notice has reason to believe will promptly communicate it to the receiver.

Section 10. Public Notice of Meetings. All meetings of the Board, including meeting minutes, shall be open to the public and subject to public access in the same way as meetings of other California public agencies provided, however, that the Board shall have the authority to undertake a closed meeting in appropriate circumstances in the same way as meetings of other California public agencies. The Board shall publish notice of its meetings within a reasonable time prior to any meeting and shall maintain a public web site that provides notices of its meetings and copies of all meeting minutes. Upon request, all information available on the web site shall be made available in hard copy to members of the public at cost.

Section 11. Quorum. Presence of a majority of the authorized number of directors at a meeting of the Board constitutes a quorum for the transaction of business, except as otherwise provided in these bylaws.

Section 12. Acts of the Board. The Board shall act by majority vote of the directors constituting a quorum for the transaction of business.

Section 13. Participation in Meetings by Conference Telephone or Webinar. Members of the Board may participate in a meeting through use of conference telephone or similar communications equipment, so long as all members participating in such meeting can hear one another.

Section 14. Waiver of Notice. Notice of a meeting need not be given to any director who signs a waiver of notice or a written consent to holding the meeting or an approval of the minutes thereof, whether before or after the meeting, or who attends the meeting, without protesting, prior thereto or at its commencement, the lack of notice to such director. All such waivers, consents, and approvals shall be filed with the corporate records or made a part of the minutes of the meeting.

Section 15. Adjournment. A majority of the directors present, whether or not constituting a quorum, may adjourn any meeting to another time and place. If the meeting is adjourned for 24 hours or less, notice of the time and place of holding an adjourned meeting need not be given to absent directors if the time and place is fixed at the meeting adjourned. If the meeting is adjourned for more than 24 hours, notice of any adjournment to another time or place shall be given prior to the time of the adjourned meeting to the directors who were not present at the time of the adjournment.

Section 16. Action Without Meeting. Any action required or permitted to be taken by the Board

may be taken without a meeting, if all members of the Board, individually or collectively, consent in writing to that action. Such action by written consent shall have the same force and effect as a unanimous vote of the Board. Such written consent or consents shall be filed with the minutes of the proceedings of the Board.

Section 17. Rights of Inspection. Every director shall have the absolute right at any reasonable time to inspect and copy all CES-21 Agreement books, records, and documents of every kind.

Section 18. Fees and Compensation. Directors and members of committees may receive reasonable compensation for their services as determined by the Board, in amounts fixed or determined by the Board. Reimbursement for reasonable expenses incurred in performance of duties may be fixed or determined by the Board.

ARTICLE FOUR – COMMITTEES

Section 1. Committees. Committees may be appointed from time to time by the Board. These committees' membership may consist of directors only, both directors and non-directors, or non-directors only (each, a "Board Committee"). Board Committees have no legal authority to act for the CES-21 Agreement except and to the extent that the Board authorizes a Board Committee or member thereof to take a specific action on behalf of the Board. Board Committees shall report their findings and recommendations to the Board.

Section 2. Acts of a Board Committee. Each Board Committee shall act pursuant to procedures adopted by the Board; provided, however, that when the Board has by resolution authorized a Board Committee to take a specific action on behalf of the Board, such Board Committee shall follow the same decision-making procedures adopted by the Board for acts of the full Board or any other decision-making procedures adopted by the Board for such committee.

Section 3. Fees and Compensation. Members of Board Committees may receive reasonable compensation of up to an amount to be determined by the Board. Reimbursement for reasonable expenses incurred in performance of duties may be fixed or determined by the Board.

ARTICLE FIVE – REPORTS

The Board 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.

ARTICLE SIX – INDEMNIFICATION

Section 1. Right of Indemnity. To the fullest extent permitted by law, PG&E, SCE and SDG&E jointly shall indemnify the non-employee directors of the Board against all expenses, judgments, fines, settlements and other amounts actually and reasonably incurred by them in connection with serving on the Board, and including an action by or in the right of the CES-21 Agreement, by reason of the fact that the person is or was a director. "Expenses," as used in this bylaw, shall

have the same meaning as in Section 5238(a) of the California Nonprofit Corporation Law.

Section 2. Approval of Indemnity. On written request to the Board by any person seeking indemnification under this Article, the Board shall promptly determine whether the applicable standard of conduct set forth in Section 5238(b) or Section 5238(c) has been met and, if so, the Board shall authorize indemnification. If the Board cannot authorize indemnification because the number of directors who are parties to the proceeding with respect to which indemnification is sought prevents the formation of a quorum of directors who are not parties to that proceeding, the court in which such proceeding is or was pending upon application made by PG&E, SCE and SDG&E jointly or the agent or the attorney or other person rendering services in connection with the defense, whether or not such application by the agent, attorney, or other person is opposed by PG&E, SCE or SDG&E, shall determine under Section 5238(e) of the California Nonprofit Corporation Law whether the applicable standard of conduct set forth in Section 5238(b) or Section 5238(c) has been met and, if so, the court shall authorize indemnification.