



from the Public Benefits Fund balance to a new account number as established by the Finance Department for the Riverside Accelerating Clean Energy by 2040 Study.

### **BOARD RECOMMENDATION:**

On October 24, 2022, the Board of Public Utilities met to consider approval of the Funds-In Agreement – Nonfederal Sponsor for the development of the Riverside Accelerating Clean Energy by 2040 (RACE/2040) Study with the United States Department of Energy facility contractor, Alliance for Sustainable Energy, LLC, manager and operator of the National Renewable Energy Laboratory, for a two-year period in the amount of \$8,182,790 plus 10% change order authority of \$818,310, for a total not-to-exceed amount of \$9,001,100, and authorization of a supplemental appropriation. After discussion, the Board Members present recommended by a vote of 6 ayes and one nay (no abstentions and one absence) to recommend that the City Council approve the staff recommendations.

### **LEGISLATIVE HISTORY:**

The State of California has established both a state-wide carbon neutrality goal and a 100% clean energy (carbon-free) target for utilities. On September 10, 2018, then-Governor Brown issued Executive Order B-55-18 (EO) setting a goal for the State to achieve carbon neutrality by 2045. Taking the first step to implement this goal, Senate Bill 100 (SB 100) was signed on the same date which, among several items, included two key directives:

1. Directed State agencies to develop plans to achieve 100% zero-carbon clean energy by 2045; and
2. Increased the State's Renewable Portfolio Standard (RPS) targets through 2030.

Building on the 2018 actions, Governor Newsom signed numerous climate-related bills into law on September 16, 2022. Among these bills, Assembly Bill 1279 (AB 1279) and Senate Bill 1020 (SB 1020) have further codified into law the goals to be achieved by 2045. AB 1279, titled the California Climate Crisis Act, put into law that it is the policy of the State both to achieve net zero greenhouse gas (GHG) emissions as soon as possible but no later than 2045, and achieve and maintain net negative greenhouse gas emissions thereafter, and to ensure that by 2045, statewide anthropogenic greenhouse gas emissions are reduced to at least 85% below the 1990 levels. SB 1020, titled the Clean Energy, Jobs, and Affordability Act of 2022, builds on the SB 100 requirements and specifies that not only must 100% zero-carbon clean energy resources supply retail sales to California end-use customers of electricity, but also that these resources supply 90% of such sales by December 31, 2035, and 95% by December 31, 2045. The bill further requires that the electricity procured to serve all state agencies be from 100% renewable and zero-carbon resources by December 31, 2035.

Implementation of these bills is considered the primary mechanism necessary for the State to achieve carbon neutrality. Carbon neutrality is dependent on a shift away from the use of fossil fuels such as gasoline and natural gas to zero carbon energy sources including electricity generated by renewable resources (e.g., solar, wind and geothermal) as well as large non-emitting hydroelectric dams and nuclear generation. Any remaining GHG emissions that result from electricity generation then need to be offset through some mechanism that either captures the carbon emissions so that it is not released into the atmosphere or that can sequester the carbon naturally, such as in forest lands. Electricity can take the place of fossil fuels for uses such as transportation and for applications in buildings including heating, water heating, and cooking.

Other industrial and commercial activities that rely on natural gas are also expected to be required to transition at some point before 2045.

State agencies including, but not limited to, the California Energy Commission (CEC) and the California Air Resources Board (CARB), are putting plans in place to achieve carbon neutrality. Both are developing new regulations to implement the requisite actions necessary to transition to clean energy. Updates to building codes, appliance energy standards, and fleet and vehicle rules are currently underway to support electrification of a variety of uses in buildings and transportation.

Riverside Public Utilities (RPU) will be affected by these changes. Directly, RPU is required to meet the RPS requirements established in SB 100 and the policies established as part of SB 1020. RPU's load and electricity demands will also be affected by the electrification of buildings and the transportation sector – actions which are being codified into the Statewide Building Codes. As customers replace fossil fuel energy with electricity, electricity use will increase and the time of day that electricity is used will change. And, as building codes are changing to require more rooftop solar and energy storage, RPU's distribution system will need to adapt to support increased two-way flows of electricity which it was not originally designed to handle.

## **BACKGROUND:**

In 2020, the City of Riverside adopted carbon neutrality and zero-carbon electricity goals. However, the City's goals have a target year of 2040, five-years earlier than the State. Both goals are found in the City Council's Envision Riverside 2025 Strategic Plan (Strategic Plan) adopted on October 20, 2020. The Strategic Plan outlines a vision for the City's future and establishes priorities and goals important to the Council.

The City's carbon neutrality goals are found under the Strategic Plan's Priority 4 - Environmental Stewardship. The two goals state:

- Goal 4.1 - Rapidly decrease Riverside's carbon footprint by acting urgently to reach a zero-carbon electric grid with the goal of reaching 100% zero-carbon electricity production by 2040 while continuing to ensure safe, reliable and affordable energy for all residents.
- Goal 4.6 - Implement the requisite measures to achieve citywide carbon neutrality no later than 2040.

Achieving these goals in the timelines set will require sweeping and in some cases wholesale changes to RPU's electric distribution grid, energy market participation, and procurement goals for renewable and carbon-free electricity. Each year, as the State seeks to achieve its carbon neutrality goals, new legislation and regulation is passed that affects RPU. Some represents direct requirements such as changes to mandates for increasing renewable energy procurement or to mandatory participation requirements of the Cap-and-Trade Program. Others, however, are more intangible but will change demands for electricity and how electricity is used. These include new building code and appliance standards that are transitioning to support or require all-electric appliances and equipment, electric vehicle charging, solar photovoltaic systems, and battery energy storage systems.

These changes are being experienced by the electric grid as a whole. In fact, the electric industry is undergoing a paradigm shift in how electric systems are planned for, designed, and operated. Because these changes are happening rapidly and affecting all levels and operations of the

electric utility, RPU needs to comprehensively evaluate options, technologies, and policies to ensure that choices are made that are cost-effective and equitable, instead of being reactionary. Analyzing comprehensively how carbon neutrality in the Riverside community will be achieved will facilitate RPU's ability to apply for and receive the funding currently being allocated by the federal and State governments to support this energy transition.

RPU initiated the discussion around carbon-free electricity with City Council and Board in late 2020 and early 2021, respectively. A workshop titled "Riverside's Clean Energy Future" was provided and included presentations from the Local Government Commission, the University of California-Riverside, and the U.S. Department of Energy National Renewable Energy Laboratory (NREL). The workshop identified the components of a clean energy future for RPU and highlighted strategies and actions that the City and RPU could take to achieve carbon neutrality, including expanding renewable energy procurement, electrification of buildings and transportation, and ensuring all customers can participate in the clean energy future.

To support the direction of City Council regarding community-wide carbon neutrality and renewable/non-emitting electricity sources, staff engaged with the Department of Energy National Renewable Energy Laboratory (NREL) to prepare a study of RPU's electric grid and generation. The item was presented to the Board of Public Utilities (Board) on February 28, 2022, following a presentation provided to the Board's Electric Committee on January 12, 2022. The Board took the following actions: 1) received and discussed a staff proposal to study and develop approaches for RPU to achieve carbon neutral energy by 2040; 2) directed staff to work with the United States Department of Energy, National Renewable Energy Laboratory to develop a proposed scope of work, including optional tasks, for the preparation of a study to evaluate various scenarios and approaches for RPU to achieve carbon neutral energy by 2040; and, 3) directed staff to bring a proposal for the preparation of the RPU Carbon Neutrality by 2040 Study to the Board of Public Utilities by the end of May 2022. While this report did not meet the May 2022 deadline, it brings forward the proposal for the Study as directed.

## **DISCUSSION:**

To move into the next stage of decarbonizing the electric grid and achieving carbon neutrality goals, RPU staff engaged NREL to develop a proposal for the RACE/2040 Study that considers:

1. Additional carbon-free electricity generation resources, including emerging technology options, such as hydrogen, for use of RPU's existing generation assets.
2. Changes in electricity demand due to transportation and building electrification as well as energy efficiency.
3. Impacts from expanding installation of customer-sited rooftop solar and energy storage.
4. Impacts to the distribution system from these changes in demand and distributed electricity generation.
5. How to integrate these changes in demand, technology, upgrades to the distribution grid, and generation in a cost effective and equitable manner that ensures that all customers benefit.

As noted in February 2022, RPU has developed excellent tools including the integrated resource plan (IRP), a geographic information system (GIS) that allows for distribution system modeling, and engineering design processes for the evaluation of development project and distribution system planning. However, these systems operate independent of one another. NREL has advanced modeling capabilities to test various scenarios and evaluate how decisions on one aspect of the utilities' operations or policy interact with others.

Testing a variety of scenarios is necessary because there is not one right way to achieve carbon-neutrality. A comprehensive, system-wide analysis of several solutions will provide detailed information for decision-making on energy strategy that will be more than direction to simply procure new carbon-free generation resources. The study will provide an understanding of the options and economic and technical tradeoffs to reaching the 2040 carbon neutrality target. The study will evaluate a variety of alternatives that will assess different scenarios of customer demand, different approaches to achieving carbon-neutral generation, and how changes in these areas affect the distribution grid.

Staff opted to pursue the RACE/2040 Study with NREL for a number of reasons. Importantly, NREL brings unbiased credibility and science-based expertise that will ensure that RPU would receive all data, models, and supporting tools to allow staff to continue to build on what the study outputs. NREL's expertise is undeniable, as they have decades of experience in energy system analysis and are considered internationally as Best-In-Class and current in the evaluation of emerging renewable power opportunities. According to the U.S. Department of Energy Office of Energy Efficiency and Renewable Energy, NREL is "the United States' primary laboratory for renewable energy and energy efficiency research and development. NREL is the only federal laboratory dedicated to the research, development, commercialization, and deployment of renewable energy and energy efficiency technologies." NREL's mission is the advancement of science and engineering of energy efficiency, sustainability transportation, and renewable power technologies and provides the knowledge to integrate and optimize energy systems.

#### Study Overview

The RACE/2040 Study will take a bottoms-up/top-down approach spanning two years. It will include an analysis of the transforming electrical load through detailed modeling of the building stock, the electrification of transportation, and distributed energy resources. These loads will be combined to create different potential futures for RPU, which will be integrated with power system models at both the bulk and distribution level to evaluate the impacts to generation and other infrastructure requirements to meet the 2040 carbon neutrality target. Included in this analysis will be an assessment of direct greenhouse gas emissions from power production, transportation, and building electrification programs and a comparison of other technical challenges to the power sector that may be faced in reaching the 2040 target year.

#### Advisory Group/Community Engagement

The Study will engage a variety of stakeholders including RPU staff, the Board of Public Utilities, City Council, and a stakeholder advisory group comprised of designated community level stakeholders who will provide comments and recommendations for the scenarios to meet future conditions. The advisory group members will be appointed by the Board to meet quarterly throughout the two-year study. Additionally, all materials, including presentations and interim reports, will be made publicly available for review and comment following each advisory group meeting and provide an opportunity for ongoing community involvement throughout the process. Materials will be provided in both English and Spanish.

#### Project and Fiscal Breakdown

The attached Statement of Work details each of the project tasks to be completed as part of the RACE/2040 Study. The following table provides a summary of the project budget by task.

<b>Task/Subtask</b>	<b>Year 1 Budget</b>	<b>Year 2 Budget</b>	<b>Total Budget</b>
<b>Task 1: Project and Data Management</b>			
<b>1.1 Project Management</b>	\$443,613.71	\$438,258.86	\$881,872.57
<b>1.2 Data Management</b>	\$206,682.71	\$197,958.86	\$404,641.57
<b>Task 2: Advisory Group</b>			
<b>2.0 Advisory Group</b>	\$373,502.71	\$455,935.86	\$829,438.57
<b>Task 3: Loads and Distributed Solar</b>			
<b>3.1 Residential and Commercial</b>	\$417,205.71	\$425,444.86	\$842,650.57
<b>3.2 Transportation</b>	\$346,969.71	\$370,686.86	\$717,656.57
<b>3.3 Customer Solar and Energy Storage, Community Solar</b>	\$523,009.43	\$276,191.71	\$799,201.14
<b>3.4 Load Allocation, Projection, Gaps</b>	\$297,107.71	\$252,451.86	\$549,559.57
<b>3.5 Demand Response</b>	\$164,855.71	\$174,884.86	\$339,740.57
<b>Task 4: Supply/Grid</b>			
<b>4.1 Bulk Power</b>	\$324,369.71	\$512,914.86	\$837,284.57
<b>4.2 Distribution</b>	\$663,990.71	\$572,912.86	\$1,236,903.57
<b>Task 5: Communication, Presentations, and Final Report</b>			
<b>5.1 Communications</b>	\$166,055.71	\$170,844.86	\$336,900.57
<b>5.2 Final Presentations</b>	\$48,755.71	\$148,166.86	\$196,922.57
<b>5.3 Final Report</b>	\$44,909.71	\$165,107.86	\$210,017.57
<b>Total Statement of Work</b>	<b>\$4,021,029</b>	<b>\$4,161,761</b>	<b>\$8,182,790</b>

Staff is also requesting 10% change order authority in the amount of \$818,310. With 10% change order authority to support any additional service hours to support the project completion, the total fiscal impact of the RACE/2040 Study is \$9,001,100.

Use of Public Benefit Charge funds

RPU staff proposes to utilize Public Benefit Charge unprogrammed funds for this project. The public benefit charge is a 2.85% charge paid by all RPU electric customers as required by State law pursuant to Public Utilities Code Division 1, Part 1, Chapter 2.3, Sections 385 and 386. All publicly owned utilities are required to establish the charge and fund investments in the following areas:

- (1) Cost-effective demand-side management services to promote energy efficiency and energy conservation.
- (2) New investment in renewable energy resources and technologies consistent with existing statutes and regulations which promote those resources and technologies.
- (3) Research, development and demonstration programs for the public interest to advance science or technology which is not adequately provided by competitive and regulated markets.
- (4) Services provided for low-income electricity customers, including, but not limited to, energy efficiency services, education, weatherization, and rate discounts.

The RACE/2040 study supports all four allowed expenditure categories, though the study directly supports the option to use funds for research projects for the public interest that advance science and new technologies that are developing to support a carbon neutral electric utility but are not yet supported by competitive and regulated markets.

Pursuant to the letter from the Department of Energy dated September 29, 2022 (Attachment 2), the Agreement is presented to the Land Use, Sustainability, and Resiliency Committee without signatures and will be approved as to form by the City Attorney and have required signatures when presented to the City Council for final approval.

### Purchasing Concurrence

Purchasing Policy 23914 Section 702(g) states, “Competitive Procurement through the Informal Procurement and Formal Procurement process shall not be required, (g) Where payment for Services is to be made to a federal, State, and/or other public entity.” The services to be provided by this agreement and attached statement of work are being provided by NREL, a government-owned, contractor-operated facility operated by the Alliance for Sustainable Energy. It is funded and overseen by the U.S. Department of Energy Office of Energy Efficiency and Renewable Energy – a federal agency.

Purchasing Policy 23914 Section 702(d) states, “Competitive Procurement through the Informal Procurement and Formal Procurement process shall not be required, (d) When the Procurement can only be obtained timely from a single source and the Manager is satisfied that the best price, terms and conditions for the Procurement thereof have been negotiated.” As discussed in the report above, the services to be provided by this agreement and the attached statement of work can only be uniquely provided by NREL due to the necessary engagement of researchers knowledgeable about the transitioning electric grid and their ability to utilize a supercomputer and to complete the full analysis of RPU’s distribution grid in combination with various related utility programs.

The Purchasing Manager concurs the recommended actions are compliant with Purchasing Resolution No. 23914, Section 702(g) and Section 702(d).

The Office of Sustainability concurs with this report. This endeavor aligns with the Strategic Plan cross-cutting thread of Sustainability and Resiliency and strategic priority of Environmental Stewardship and will advance our understanding of pathways to reduce the City’s carbon footprint and achieve carbon neutrality.

### **STRATEGIC PLAN ALIGNMENT:**

The RACE/2040 Study contributes to **Priority 4 - Environmental Stewardship** and the following goals:

- **Goal 4.1:** Rapidly decrease Riverside’s carbon footprint by acting urgently to reach a zero-carbon electric grid with the goal of reaching 100% zero-carbon electricity production by 2040 while continuing to ensure safe, reliable and affordable energy for all residents.
- **Goal 4.6:** Implement the requisite measures to achieve citywide carbon neutrality no later than 2040.

This item aligns with each of the five Cross-Cutting Threads as follows:

1. **Community Trust** – The Study will provide a transparent stakeholder process as it develops and evaluates various scenarios to help the City achieve carbon neutrality by 2040.
2. **Equity** – The Study will specifically focus on evaluating how different paths to achieve

carbon neutrality will affect all customers, specifically considering affordability, access, and equity.

3. **Fiscal Responsibility** – By completing the Study, decision-makers will have a comprehensive, robust, science-based report on which to make cost effective decisions for how RPU should achieve carbon neutrality by 2040.
4. **Innovation** – Preparing the Study with a national and international research leader such as NREL will ensure that best available technology and program design is evaluated and that results provide robust and credible data for decision-making.
5. **Sustainability & Resiliency** – The Study will help identify a variety of paths for RPU to achieve carbon-neutral electricity for the City that ensure reliability, safety, and affordability as well as helping the City achieve carbon neutrality and other environmental goals.

### **FISCAL IMPACT:**

The total fiscal impact for the Study is \$9,001,100 including \$8,182,790 for the agreement and \$818,310 for 10% change order authority. A supplemental appropriation of \$9,001,100 is required from the Public Benefits Fund, Undesignated Reserves to a new account number as established by the Finance Department for the Riverside Accelerating Clean Energy by 2040 Study.

Prepared by: Todd M. Corbin, Utilities General Manager  
Certified as to  
availability of funds: Edward Enriquez, Interim Assistant City Manager/Chief Financial Officer/City Treasurer  
Approved by: Kris Martinez, Assistant City Manager  
Approved as to form: Phaedra A. Norton, City Attorney

### Attachments:

1. Standard Agreement – Funds-in Agreement (FIA) - Nonfederal Sponsor with Alliance for Sustainable Energy, LLC, Manager and Operator of the National Renewable Energy Laboratory
2. Letter from Department of Energy
3. Response to public comments received at the Board of Public Utilities October 24, 2022 meeting
4. Presentations