

**INTEGRATED RESOURCE PLAN (IRP)**

Date:

June 30, 2023

IRPs shall consider all reasonable opportunities to meet future energy resource requirements using Demand Side Management techniques, new renewable resources and other programs that will provide retail consumers with electricity at the lowest possible costs, and minimize, to the extent practicable, adverse environmental effects.

To meet your Integrated Resource Planning reporting requirement, complete the following. Unaddressed items will be deemed incomplete and not eligible for approval. Western reserves the right to require customers to provide any supporting back-up data used to support and develop this report.

**Customer Contact Information:**

(Provide contact information for your organization. Contact person should be able to answer questions concerning the plan)

<b>Customer Name:</b>	<b>DOE Northern California Sites Electric Power Consortium</b>
<b>Address:</b>	<b>Berkeley Site Office 1 Cyclotron Road Berkeley, California 94720</b>
<b>Contact Person:</b>	<b>Mary Gross</b>
<b>Title:</b>	<b>Electric Power Services Manager, Office of Science, Berkeley Site Office</b>
<b>Phone Number:</b>	<b>510-486-4373</b>
<b>E-Mail Address:</b>	<b>Mary.Gross@Science.doe.gov</b>
<b>Website:</b>	

**Type of Customer:**

(Check one as applicable)

<input type="checkbox"/>	<b>Municipal</b>
<input type="checkbox"/>	<b>State</b>
<input checked="" type="checkbox"/>	<b>Federal</b>
<input type="checkbox"/>	<b>Irrigation District</b>
<input type="checkbox"/>	<b>Water District</b>
<input type="checkbox"/>	<b>Other (Specify) _____</b>

**Identification of Resource Options (considerations that may be used to develop potential options include cost, market potential, consumer preferences, environmental impacts, demand or energy impacts, implementation issues, revenue impacts, and commercial availability):**

**Supply-side options:**

(Including, but not limited to: purchase power contracts and conventional and renewable generation)

<b>List existing supply-side options:</b>	<b>List future supply-side resource options considered and evaluated:</b>
<p>The U.S. Department of Energy (DOE) plans the electric power supply arrangements for Lawrence Berkeley National Laboratory (LBNL), Lawrence Livermore National Laboratory (LLNL) including Site 300, and the SLAC National Accelerator Laboratory (SLAC) so as to minimize the combined costs of the laboratories (collectively the DOE Northern California Sites Electric Power Consortium, or Consortium).</p>	<p>LBNL: Rooftop solar</p>
<p>The Consortium has a 4.82618% share of Central Valley Project (CVP) power. CVP power actually received by the Consortium varies seasonally and annually depending on hydropower conditions and factors affecting total CVP output. The Consortium is expected to receive approximately 144,344 MWh of CVP power in 2024, based on the most recent forecast prepared by the Western Area Power Administration (Western). CVP deliveries to the Consortium are expected to return to normal levels, approximately 137,000 MWh annually, in 2025 and beyond.</p>	<p>LLNL: PV installations on new buildings</p>
<p>Energy requirements not supplied by the Consortium’s CVP allocation are met through wholesale market purchases made at the California-Oregon border (COB) and in Northern California (NP-15). Purchases made at COB are delivered to the Bay Area using DOE’s transmission capacity entitlement in the California Oregon Transmission Project (COTP). Western acts as the Consortium’s power supply portfolio manager. As of June 2023, Western had in place for the Consortium the following forward market purchases:</p> <ul style="list-style-type: none"> <li>• 2024: 50 MW all-hours</li> <li>• 2025: 25 MW all-hours</li> </ul>	
<p>Any power not supplied by CVP and forward market purchases is secured in day-ahead and real-time wholesale energy market transactions (either purchases or sales of excess energy).</p>	
<p>3.3 MW on-site Solar Facility</p>	
<p>LLNL: Solar Charging Equipment for Electric Vehicles</p>	

**Demand-side options:**

<b>List existing demand-side options:</b>	<b>List future demand-side resource options considered and evaluated:</b>
<p>LBNL: Ongoing commissioning</p>	<p>LLNL: HVAC Controls upgrade on existing facilities</p>

LLNL: HVAC Controls upgrade on existing facilities	LLNL: HVAC replacements
LLNL: Lighting occupancy sensors	LLNL: Lighting occupancy sensors
LLNL: Lighting replacements with LED lights	LLNL: Lighting replacements with LED lights

**Resource options chosen:**

(Provide a narrative statement that describes the option chosen and clearly demonstrates that decisions were based on a reasonable analysis of the options)

The Consortium’s CVP power allocation typically can be expected to supply between 6 and 17 percent of the Consortium’s energy requirements depending upon CVP output and the laboratories’ requirements. The 3.3 MW on-site Whitethorn Solar facility provides approximately 0.7 percent of the Consortium’s energy requirements. The remaining energy requirements are met with wholesale market purchases.

The Consortium directs Western to make wholesale market block power purchases in advance of delivery as part of a risk management strategy. The majority of the Consortium’s projected energy requirements not expected to be supplied by CVP power for the first two forward years are purchased in advance using fixed price forward purchases. This minimizes the Consortium’s exposure to price volatility and maximizes the predictability of costs for two years forward. The level of fixed price forward purchases in the Consortium’s power supply portfolio in subsequent forward years is gradually reduced such that typically no forward purchases have been made in farther out years. The Consortium’s transmission entitlement over the COTP is utilized to buy relatively lower cost energy at COB, with supplemental purchases made in Western’s control area and at NP-15.

LLNL is considering HVAC Controls upgrade on existing facilities - added to the WebCTRL system is the recommended option since HVAC controls on existing facilities are in need of upgrades. Chiller replacements for large laboratory facilities have the potential to result in a 45% energy reduction. For LBNL, existing demand-side options are planned to be implemented. Additional efficiency opportunities will be analyzed as additional information will become available and will be implemented if cost effective and feasible.

**Action Plan:**

**Specific Action Items to be Implemented Over the Next 5 Years:**

(Lists are not meant to be inclusive, complete and provide other action items as applicable)

### Energy Consumption Improvements:

Proposed Items	Begin Date	End Date	Est. kW capacity savings per year	Est. kWh savings per year	Milestones to evaluate accomplishments
Boiler, Furnace, air conditioning retrofits	2024			1,750,000	
Weatherization, insulation storm windows/doors					
Insulation of air ducts, boilers, pipes, etc.					
Clock thermostats and equipment system timers					
Heat pumps				-650,000	Replace existing natural gas furnace building heating system with heat pump - will result in increase in electricity consumption.
Energy audits	6/1/2020	5/30/2024	77.2	338,000	EISA Audits cycle '20-'24
	2024			100,000	
Public education programs					
Loan arrangements or rebate program for energy efficient equipment					
Use of infrared heat detection equipment					
Energy efficient lighting		9/30/2024	20.8	182,491	HID Lighting 5 buildings
	2024			300,000	
Equipment inspection programs					
Electric motor replacements	2024			20,000	
Upgrading of distribution lines/substation equipment					
Power factor improvement					
Other: Roof Replacements	2024			200,000	
Other: Ongoing Commissioning				400,000	Ongoing commissioning of existing buildings and facilities.

### Renewable Energy Activities:

Proposed Items	Begin Date	End Date	Est. kW savings per year	Est. kWh savings per year	Milestones to evaluate accomplishments
Solar thermal/photovoltaic projects				400,000	Installation of rooftop solar on two new construction

					buildings
Day lighting technologies					
Active solar installations	2027			50,000	
Active solar installations					
Biomass/refuse-derived fuels					
Geothermal projects					
Small-scale hydro projects					
Other:					

**Load Management Techniques:**

Proposed Items	Begin Date	End Date	Est. kW savings per year	Est. kWh savings per year	Milestones to evaluate accomplishments
Load management devices/systems					
Demand control techniques and equipment					
Smart meters or automated equipment	2024			571,000	
Time-of-use meters					
Other:					

**Rate Design Improvements:**

Proposed Items	Begin Date	End Date	Est. kW savings per year	Est. kWh savings per year	Milestones to evaluate accomplishments
Cost-of-service pricing					
Elimination of declining block rates					
Time-of-day rates					
Seasonal rates					
Interruptible rates					
Other:					

**Agricultural Improvements:**

Proposed Items	Begin Date	End Date	Est. kW savings per year	Est. kWh savings per year	Milestones to evaluate accomplishments
Irrigation pump utilization/scheduling					
Irrigation pump testing or efficiency improvements					
Electric motor replacement					
Photovoltaic pumping systems					
Ditch lining or piping					
Laser land leveling					

Pumpback systems					
Water conservation programs					
Other:					

5-Year Plan

**Environmental Effects:**

(Provide a narrative statement that sets forth the efforts taken to minimize adverse environmental effects of new resource acquisitions)

The Consortium participates in the Western Renewable Energy Generation Information System (WREGIS) REC program. Actual quantities received will vary year to year. These RECs are then doubled as a bonus for Renewable Generation on Federal Land.

The Consortium receives RECs associated with output from the on-site Whitethorn solar facility, as well. LLNL is entitled to 80 percent of the renewable attributes produced, and LBNL is entitled to 20 percent. Actual quantities received will vary year to year. These RECs are then doubled as a bonus for Renewable Generation on Federal Land.

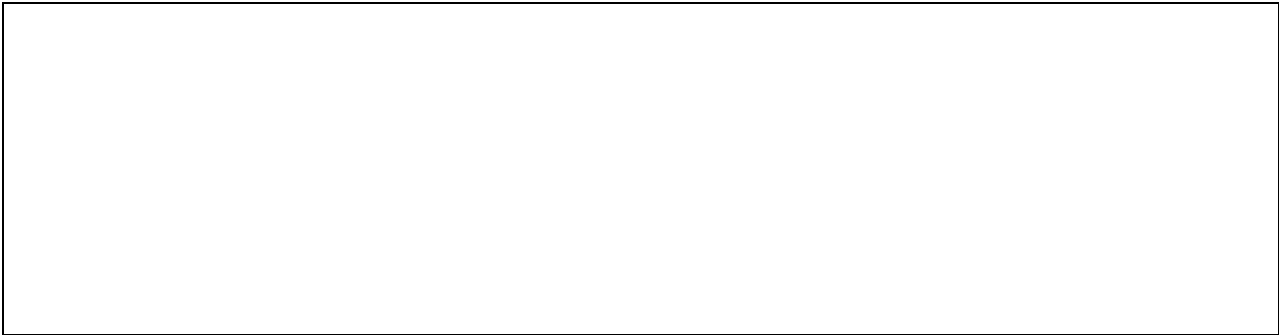
The Laboratories purchase Renewable Energy Credits (RECs) to satisfy federal renewable energy requirements, if need exists beyond the WREGIS RECs and solar facility RECs received. These purchases are made through Western-coordinated RFPs.

The Consortium participates in California's Cap and Trade Program and receives an allotment of greenhouse gas allowances provided by the California Air Resources Board (CARB).

**Public Participation:**

(Customers must provide ample opportunity for full public participation in preparing and developing an IRP. Provide a brief description of public involvement activities, including how information was gathered from the public, how public concerns were identified, how information was shared with the public, and how it responded to the public comments)

5-Year Plan



# 5-Year Plan



**Future Energy Service Projections:**

(Provide a load forecast to show expected growth or expansion; or a narrative statement concerning expected future growth)

Calendar Year	Peak Demand (kW)	Total Energy (kWh)
2024	112,300	836,341,000
2025	109,100	816,246,000
2026	131,300	881,491,000
2027	136,100	1,020,777,000
2028	163,400	1,134,777,000

or Narrative Statement:

**Measurement Strategies:**

(Provide a brief description of measurement strategies for options identified in the IRP to determine whether the IRP's objectives are being met. These validation methods must include identification of the baseline from which a customer will measure the benefits of its IRP implementation)

Improvements to metering are being conducted in 2023 and metering data will be used to measure and verify data.

**IRP Approval:**

(Indicate that all of the IRP requirements have been met by having the responsible official sign below; or provide documentation that the IRP has been approved by the appropriate governing body)

(Name – Print or type)	(Title)
(Signature)	(Date)

**Other Information:**

(Provide/attach additional information if necessary)