CITY OF RIVERSIDE, CALIFORNIA

FIVE YEAR INTEGRATED RESOURCE PLAN

FISCAL YEARS 2013 – 2017

April 24, 2013

WATER | ENERGY | LIFE

CITY OF RIVERSIDE

PUBLIC UTILITIES

1 TABLE OF CONTENTS

2 BACKGROUND:

The City of Riverside, California (Riverside) submits this five-year Integrated Resource Plan (IRP) to meet the reporting requirements established by the Western Area Power Administration (WAPA). This five-year IRP provides information regarding power planning efforts between fiscal years (FY) 2013 and 2017 or July 1, 2012 through June 30, 2017.

3 HISTORICAL AND FORECAST PEAK DEMAND AND ENERGY CONSUMPTION

3.1 Historical

Riverside's peak demand and energy consumption for the past five fiscal years (2008 through 2012) is summarized in the table below:

	Fiscal Year Ended June 30,				
	2008	**2009**	**2010**	**2011**	**2012**
System Total (MWh)	2,293,554	2,229,308	2,158,331	2,121,694	2,218,432
Peak Demand (MW)	604	534	560	580	581

The peak demand for the fiscal year ended June 30, 2012 was 581 MW. The all-time high for Riverside's peak demand of 604 MW was set on August 31, 2007.

3.2 Forecast

The following table summarizes the forecast of Riverside's peak demand and energy consumption for the next five fiscal years (2013 through 2017).

	Fiscal Year Ended June 30,				
	2013	**2014**	**2015**	**2016**	**2017**
System Total (MWh)	2,265,899	2,295,705	2,335,797	2,390,464	2,431,619
Peak Demand (MW)	570	573	577	583	588

4 LOAD FORECASTING METHODOLOGY

4.1 Overview

Riverside uses regression based econometric models to forecast both its total expected GWh system load and system MW peak on a monthly basis. Regression based econometric models are also used to

forecast expected monthly retail GWh loads for our four primary customer classes. These models are calibrated to historical load and/or sales data extending back to January 2003. The input variables to these econometric models include various monthly weather summary statistics, specific calendar effects and two econometric input variables for the Riverside – San Bernardino – Ontario metropolitan service area: annual per capita personal income (PCPI) and monthly non-farm employment (EMP) estimates. The monthly forecasts produced by these models are normally used to project Riverside's wholesale gross and peak loads and retail sales five years forward.

Riverside does not currently produce forecasts of the following variables: customer counts associated with any specific customer class, peak loads associated with any specific customer class, or future electrical rates for any customer class and/or tier rate structure. Since both our wholesale and retail forecast models are calibrated to historical load data, the corresponding forecasts implicitly capture the demand side effects of all active Demand Side Management (DSM) programs at their current funding and implementation levels. Additionally, Riverside has no Electric Service Providers (ESPs) in its service territory and does not anticipate either losing any existing load or gaining any new service territory over the next 10 years.

4.2 General Modeling Methodology

The following load based metrics are modeled and forecasted by Riverside's Power Resources department:

- Hourly system loads (MW)
- Total monthly system load (GWh)
- Maximum monthly system peak (MW)
- Total monthly retail loads for our Residential, Commercial, Industrial and Other customer classes (GWh)

Additionally, dynamic-regression (time series) models are used to simulate the following seasonal weather information (UCR CIMIS Weather Station data) for the Riverside electrical service area:

- Riverside average daily temperature (°F)
- Riverside max-min temperature differential (°F)

These daily weather data simulations are used in our hourly system load equations (to produce prospective, simulated hourly system loads). These daily temperature simulations are also summarized into monthly cumulative cooling and heating degree indexes; the average value of these indexes are in turn used as prospective weather input values for our monthly load forecasting equations, respectively. All primary monthly forecasting equations are statistically developed and calibrated to 7-8 years of

historical monthly load data. The parameter estimates for each forecasting equation are updated every 6 months; if necessary, the functional form of each equation can be updated or modified on an annual basis.

5 POWER SUPPLY RESOURCES INCLUDING RENEWABLE RESOURCES

Riverside's electricity supply consists of power from (i) the Springs Generating Station (Springs) and Riverside Energy Resource Center (RERC) Generating Projects, (ii) the Clearwater Cogeneration Facility (Clearwater), (iii) its ownership interest in the San Onofre Nuclear Generating Station (SONGS), (iv) entitlements in the Intermountain Power Project (IPP) Generating Station, the Palo Verde Nuclear Generating Station and the Hoover Uprating Project, (v) a long-term contract of firm purchases from Bonneville Power Administration (BPA), (vi) contracts for renewable energy, (vii) firm energy purchases from other entities, and (viii) energy purchased through the California Independent System Operator's (CAISO) centralized markets.

5.1 Existing Resources

Riverside's existing resources include a mixture of conventional supply resources with a diverse fuel mix and renewable resources, with a total summer peaking capacity of roughly 590 MW. Riverside's power supply portfolio and existing resources are discussed in detail below.

5.1.1 Local Generation

Riverside owns and operates 3 natural gas generating facilities: Springs, RERC, and Clearwater. These city-owned resources are summarized in the table below and discussed briefly thereafter:

Riverside City-Owned Resources

Resource	Type	Technology	Capacity (MW)
Springs	Natural Gas	Simple Cycle	36
RERC	Natural Gas	Simple Cycle	194
Clearwater	Natural Gas	Combined Cycle	28

Springs Generating Station: Springs consists of four natural gas simple-cycle turbine generators, each with a capacity of 9 MW. The plant began commercial operation in 2002 and is primarily used during periods of super peak power demand in Riverside to enhance reliability and service delivery to customers.

Riverside Energy Resource Center: RERC consists of four LM6000 simple-cycle combustion turbine peaking units, rated at 48.5 MW each. Units 1 & 2 became operational in 2006; Units 3 & 4 became

operational in 2011. All four RERC units are used to enhance reliability and service delivery to customers and to provide energy and ancillary services in the CAISO markets.

Clearwater Cogeneration Facility: Riverside purchased Clearwater from the City of Corona on September 1, 2010. Clearwater consists of a single GE LM2500 combustion turbine generator operating in combined cycle with one RENTECH heat recovery steam generator and one SHIN NIPPON steam turbine generator. Clearwater has a capacity of 28 MW.

5.1.2 Existing Resources

The bulk of Riverside's energy requirements are met by firm power supply purchase contracts of varying terms. Riverside's current firm power supply purchase contracts are summarized in the table below and discussed briefly thereafter:

Riverside Contracted Resources

Resource	Type	Capacity Entitlement (MW)	Contract Expiration
IPP	Coal	137	2027
SONGS	Nuclear	38.5	2022
Palo Verde	Nuclear	12	2030
Hoover	Large Hydro	30	2067
BPA II	Primarily Hydro	Summer (Peaking): 60 Winter (Peaking): 15 May/June (Flat): 40	2016
Salton Sea	Geothermal	46	2020
Wintec	Wind	1.3	2018
WKN	Wind	6	2027
Covanta	Waste	18	2013

Intermountain Power Project: Riverside has a 7.617% (approximately 137.1 MW) entitlement in the coal-fired IPP Generating Station Units 1 and 2 located near Lynndyl, Utah. Units 1 and 2 were declared to be commercially operational in June 1986 and May 1987, respectively. Riverside entered into a power sales agreement with the Intermountain Power Agency (IPA), as the owner of IPP Generating Station, which obligates Riverside to its share of capacity and energy of the IPP Generating Station on a "take-or-pay" basis. The current contract expires in 2027.

San Onofre Nuclear Generating Station: Riverside has a 1.79% undivided ownership interest in Units 2 and 3 of SONGS, located in Northern San Diego County, California. Units 2 and 3 became operational in October 1983 and April 1984, respectively. The capacity available to Riverside from SONGS Units 2 and 3 is 19.2 MW and 19.3 MW, respectively. Riverside has formally agreed to participate in the operation of SONGS through 2022, the year that the operating licenses for SONGS expire.

Palo Verde Nuclear Generating Station: Riverside has a 5.4% (11.7 MW) entitlement in Palo Verde through the Southern California Public Power Authority (SCPPA). Riverside entered into a power sales agreement with SCPPA which obligated Riverside to its share of capacity and energy on a "take-or-pay" basis for the life of the project – the project was designed to have a 40-year life.

Hoover: Riverside has a 30 MW entitlement to capacity and the associated energy from Hoover under the Electric Services Contract with WAPA. Riverside began receiving energy from Hoover in 1986, and the current contract ends in 2017.

Bonneville Power Administration Power Sale/Exchange Agreement (BPA II): Riverside and BPA currently have an agreement (Sale/Exchange Contract), which makes available to Riverside at the Nevada-Oregon Border 60 MW of peaking energy for the summer season (July – October) and 15 MW peaking energy during the winter season (November – April). Riverside also receives 40 MW of flat energy during May and June. This Sale/Exchange agreement will terminate in 2016 unless extended.

Salton Sea: Riverside has a power purchase agreement with CalEnergy for base-load, renewable, geothermal energy from Salton Sea Unit 5 through 2020. The agreement entitles Riverside to 46 MW of base-load energy from Unit 5.

Wintec: Riverside has a fifteen-year power purchase agreement with Wintec-Pacific Solar, LLC and currently receives 1.3 MW from two wind turbine generators located near Palm Springs. Riverside began receiving the wind energy in 2003.

WKN Wagner: Riverside has a twenty-year power purchase agreement with WKN and currently receives 6 MW from two wind turbine generators located near Palm Springs. Riverside began receiving the wind energy in January 2013.

Covanta: Riverside entered into a short term Western Systems Power Pool (WSPP) Agreement with Covanta Energy Marketing LLC to purchase approximately 18 MW of renewable energy from Covanta Stanislaus, Inc.'s Energy-from-Waste System located in Crows Landing, California. Riverside began receiving this renewable energy in December 2012. This agreement will terminate in November 2013 unless extended.

5.1.3 Contracted Future Resources

Riverside recently entered into two long term power purchase agreements with two solar PV projects. These two projects are shown in the following table and discussed briefly thereafter.

Riverside's Contracted Future Resources

Resource	Type	Capacity Entitlement (MW)	Commercial Operation	Contract Expiration
AP North Lake Solar	Solar PV	20	2015	2040
Antelope Big Sky Ranch Solar Project	Solar PV	20	2015	2040

AP North Lake Solar: Riverside has entered into a 25-year power purchase agreement with AP North Lake Solar, L.P. to purchase 20 MW of solar photovoltaic energy from a solar photovoltaic renewable electric generating facility in Riverside County, California. Energy deliveries are expected to commence in early 2015 when the generating facility is scheduled to come online.

Antelope Big Sky Ranch Solar Project: Riverside executed a 25-year power purchase agreement with Antelope Big Sky Ranch LLC through SCPPA to purchase 20 MW of solar photovoltaic energy from a solar photovoltaic electric generating facility in the City of Lancaster, California. Energy deliveries are scheduled to commence in early 2015 when the generating facility is scheduled to come online.

5.1.4 Other Power Purchases

Riverside also supplements the energy available from its firm resources with energy purchased from other suppliers throughout the western United States, as well as the CAISO Integrated Forward Market (IFM) and real time market. These purchases are made under the WSPP Agreement, numerous bilateral agreements with various suppliers, and under the FERC sanctioned CAISO Tariff.

5.2 Power Supply

The following tables summarize Riverside's historical and forecast power supply portfolio used to serve load:

Historical Power Supply

Power Supply (MWh)	Fiscal Year Ended June 30,				
	2008	2009	2010	2011	2012
Nuclear					
San Onofre	286,500	281,400	240,000	284,900	191,900
Palo Verde	85,200	97,700	96,300	102,000	101,100
Coal					
Intermountain Power	1,094,100	1,051,200	1,068,500	895,600	799,700
Deseret	427,600	406,000	187,400	0	0
Hydroelectric					
Hoover	33,700	32,500	30,000	32,900	35,300
Gas					

Historical Power Supply

Power Supply (MWh)	Fiscal Year Ended June 30,				
	2008	2009	2010	2011	2012
Springs	2,300	3,300	1,400	3,100	2,300
RERC	46,800	48,700	11,500	64,500	39,400
Clearwater	0	0	0	9,700	17,000
Renewable Resources	247,800	233,000	354,900	385,700	409,800
Other Purchases	594,100	349,200	276,500	464,200	682,500
Exchanges In	115,700	90,000	92,700	92,200	75,200
Exchanges Out	(202,600)	(160,600)	(156,200)	(176,100)	(133,500)
Total	2,731,200	2,432,400	2,203,000	2,128,700	2,220,700

Forecast Power Supply

Power Supply (MWh)	Fiscal Year Ended June 30,				
	2013	2014	2015	2016	2017
Nuclear					
San Onofre	9,702	88,426	158,370	159,022	158,370
Palo Verde	92,582	92,819	93,127	93,055	92,820
Coal					
Intermountain Power	854,302	921,665	898,224	863,037	839,063
Hydroelectric					
Hoover	35,624	35,623	35,623	35,620	35,624
Gas					
Springs	1,498	1,244	1,394	1,745	2,008
RERC	63,961	94,779	89,327	102,772	110,232
Clearwater	8,241	7,590	8,426	9,654	11,421
Renewable Resources	442,372	433,071	437,958	547,789	646,617
Other Purchases	798,669	685,899	678,688	701,310	535,464
Exchanges In	100,860	101,220	101,220	42,750	0
Exchanges Out	(141,912)	(166,631)	(166,560)	(166,290)	0
Total	2,265,899	2,295,705	2,335,797	2,390,464	2,431,619

6 ENERGY EFFICIENCY AND OTHER DEMAND-SIDE PROGRAMS

Riverside's innovative energy efficiency programs have exceeded goals, garnered national attention and assisted customers in savings on their utility bills while reducing energy consumption. Riverside is committed to meeting the annual energy efficiency and conservation goals it has established through Assembly Bill 2021 (AB2021) for energy and demand reduction. The revised energy reduction goal of 232,503 MWh over the next 10 years represents 1% of the revised Load Forecast completed in 2010. Below is a list of Riverside's major residential and commercial energy efficiency programs. This list also highlights other programs and services offered in the areas of renewable energy, research, development and demonstration and low income assistance.

Commercial Rebate Programs

- Air Conditioning Incentives – rebates for replacement or first time purchase of energy efficient AC units
- Energy Star – rebates for purchase of Energy Star refrigerators, dishwashers, commercial clothes washers, solid door refrigerators/freezers
- Lighting Incentive – rebates for kWh savings on installation of energy efficient lighting
- New Construction Incentive – rebates for energy savings exceeding Title 24 standards for new construction projects pre-approved by Riverside
- Pool and Spa Pumps Incentive – rebates for purchase of qualifying energy efficient pumps and motors
- Tree Power – rebates for purchase and planting of up to 5 qualifying shade trees per year
- Thermal Energy Storage Incentive – feasibility study and incentives available for use of Thermal Energy Storage based on guidelines
- Performance Based Incentive – rebates for customers who can demonstrate a kWh savings based on custom energy-efficiency measures
- Commercial Photovoltaic Incentive – rebates for customers who install PV on their business to reduce peak load
- Energy Innovations Grant for Post Educational Institutions – for the funding of research, development and demonstration programs for the public interest to advance science or technology in electric related projects in the institutions of higher education within the City of Riverside
- Custom Energy Technology Grants – grants are awarded for research, development, and demonstration of energy efficiency projects that are unique to the business or manufacturing

Direct Installation Commercial Programs

- Small Business Direct Installation (SBDI) – provides an audit and up to $1,000 in free energy-efficient measures including high efficiency lighting retrofits, HVAC Tune Ups, LED or electroluminescent Exit Sign replacement, Occupancy Sensors, Strip-Curtains for walk-ins and installation of vending/cooling misers
- Keep Your Cool – provides targeted businesses a free evaluation of the efficiency of existing refrigeration equipment and the installation of a variety of energy efficient measures including door gaskets, strip curtains, door closures, LED case lighting, electric motors and controls

Residential Rebate Programs

- Energy Star – rebates for purchasing Energy Star rated appliances that use less energy and water
- Cool Cash – rebates for replacing Central Air Conditioners with a SEER rating of 15 or above
- Tree Power – rebates for purchasing and planting up to 5 qualifying shade trees per year and 1 free qualifying shade tree coupon printed on the back of the March bill
- Residential Photovoltaic Incentive – rebates for customers who install PV on their home to reduce peak load and offset high electricity bills
- Pool Saver – rebates for purchasing efficient pool pump motor, and monthly credit for using pool pumps during off-peak hours
- Weatherization – rebates for installing attic insulation or wall insulation, standard rebated for duct replacement, duct testing/sealing. Window replacement, window film, solar and standard attic fans, whole house fans and cool roofs
- Whole House (ARRA/PBC Funded) – rebates for completing two or more energy efficiency measures at a time; points are awarded for each type of measure and then multipliers are given at specific point intervals on a sliding scale to encourage implementation of more energy efficiency measures

Special Residential and Customer/Community Services

- Appliance Recycling – free recycling service for old inefficient refrigerators
- Utilicare – provides reduced rates to households that require specific types of life support medical equipment
- SHARE – credits up to $150 toward electric deposit or bill payment assistance for qualified low-income applicants annually
- Green Power Premium – allows customers to donate an additional 2 cents per kWh above their current kWh rate to assist in purchasing renewable energy resources

- Community Education and Outreach – Riverside offers a comprehensive Education Program for schools. This program targets 4th, 5th, and 6th grade students and is designed to educate students on energy, water and conservation through classroom presentation and mobile standards-based science lab kits that integrate into existing science classroom curriculum

Photovoltaic Efforts (Solar)

Riverside continues to promote residential and commercial participation in its renewable energy programs. In support of Senate Bill 1 (SB1) Riverside has allocated a budget of $2.5 million annually through 2016 for customer installed systems

Riverside has a goal of installing 20 megawatts of local photovoltaic by 2020. As of the last fiscal year, there were 144 residential installation totaling 694 kW AC and 9 non-residential systems generating 559 kW AC of renewable solar energy. Riverside currently has over 4 megawatts of photovoltaic systems installed and operational.

Research, Demonstration and Development (RD&D)

Riverside continues to invest in RD&D programs through local higher education institutions and also participates in SCPPA-related RD&D efforts. Below is a list of grants that Riverside has awarded:

- $100,000 grant to the University of California at Riverside (UCR) College of Engineering, Center for Environmental Research and Technology (CE-CERT) for research designing efficient miniaturized energy-storage devices
- $100,000 grant to California Baptist University, College of Engineering to fund research related to solar powered air conditioning systems
- Custom Energy Technology Grant was awarded to the City of Riverside Parks, Recreation and Community Services Department for installation of SolarBee Solar Powered Floating Aeration Devices to be installed at Fairmount Park's lakes; these devices are estimated to save over one-half million kilowatt hours per year

Demand Response/Smart Grid

Riverside created and implemented the Power Partners Voluntary Load Shed Program during fiscal year 2012. The program is meant to help reduce the demand on the regional energy grid and lessen the likelihood of temporary planned outages. Since inception, 25 of Riverside's Key Account customers have signed up for the program and committed to 14 megawatts of load shed capability.

In addition to the Power Partners program, Riverside continues to implement a commercial time-of-use rate to encourage off-peak energy use by its large customers. Furthermore, Riverside is evaluating other demand response measures such as Smart Grid technology and ICE Bear applications.

7 TRANSMISSION PROJECTS

On January 1, 2003, Riverside became a Participating Transmission Owner (PTO) in the CAISO by transferring operational control of its transmission entitlements to the CAISO. In return, Riverside receives monthly payments from the CAISO for recovery of Riverside's annual transmission revenue requirement.

8 ENGAGEMENTS DURING THE PERIOD OF FISCAL YEAR 2013 THROUGH 2017

8.1 Renewable Energy

On April 12, 2011, the California Renewable Energy Resources Act (SB 2 (1X)) was passed by the State Legislature and signed by the Governor. SB2 (1X) revised the amount of statewide retail electricity sales from renewable resources in the State Renewable Energy Resources Program to 33% by December 31, 2020 in three stages:

- Compliance Period 1 (CP1): average of 20% of retail sales during 2011-2013
- Compliance Period 2 (CP2): 25% of retail sales by December 31, 2016
- Compliance Period 3 (CP3): 33% of retail sales by December 31, 2020

The new legislation also established three portfolio content categories, with each category having its own procurement requirements by Compliance Period, to which Riverside must adhere. The three portfolio content categories are defined below:

- Category 1 (PCC1): Renewable resources located in California
- Category 2 (PCC2): Firmed and Shaped renewable energy scheduled into California
- Category 2 (PCC3): Renewable Energy Credits (RECs)

The Riverside Public Utilities Board and City Council approved the enforcement program required by SB 2 (1X) on November 18, 2011 and December 13, 2011, respectively.

8.1.1 New Short-term Renewable Energy Purchases

Since early 2011, Riverside Public Utilities has been procuring short term renewable energy products from all three portfolio content categories in order to satisfy our SB2 (1X) CP1 renewable mandates. To

date, Riverside has purchased or contracted for 40.8 GWh of firmed and shaped PCC2 wind energy and 37.5 GWh of PCC3 RECs. Additionally, Riverside has entered into a one year contract with Covanta Energy Marketing, LLC for approximately 126 GWh of PCC1 renewable energy from the Covanta waste-to-energy biomass plant in Stanislaus County, CA. In conjunction with the new WKN wind energy resource coming on-line in January 2013 (see below), Riverside expects to have procured enough new renewable energy to be fully compliant with the new SB2 (1X) mandates for CP1.

8.1.2 New Long-term Renewable Energy Purchases

In addition to short-term purchases, Riverside has been actively engaged, on its own and through SCPPA, in evaluating and contracting additional long term renewable resources to meet the needs of CP2 and CP3. In fact, Riverside has executed three long-term renewable energy power purchase contracts since October 2012. The table below shows Riverside's recently contracted long-term renewable projects:

Table 3-5
Recently Contracted Long-Term Renewable Resources

Resource	Type	Capacity Entitlement (MW)	Term	COD
WKN Wagner	Wind	6	20	January 2013
AP North Lake Solar	Solar PV	20	25	2015
Antelope Big Sky Ranch Solar Project	Solar PV	20	25	2015

In addition to the aforementioned projects, by 2017, Riverside anticipates procuring an additional 35 MW of solar PV and/or solar thermal energy contracts (generating 62 GWh annually) and an additional 40 MW new base-load renewable energy contracts (generating 314 GWh annually). Riverside is also looking to extend its current 46 MW geothermal energy contract with CalEnergy.

These additional contracts will be identified and selected using a best-fit, least-cost procurement strategy and used to meet and/or exceed the SBX1-2 mandates for future compliance periods (CP2, CP3 and beyond 2020).

8.1.3 Long-term Renewable Procurement Strategy

As stated above, Riverside employs a least-cost, best-fit procurement strategy to acquire new renewable resources. Riverside's Power Resources Department actively seeks to identify new renewable resources that are commercially viable, enhance and diversify Riverside's resource portfolio, mitigate future regulatory risks, and optimize the SB2 (1X) procurement content categories in the most cost effective

manner possible. Under the direction of City Council, Riverside shall diligently work towards securing enough new renewable resources to meet our current and future compliance period and procurement content category mandates in the most cost-effective manner possible, in order to minimize future rate impacts to our retail customers.

8.2 Conventional Resource Replacement and Procurement

Within the next five years, Riverside will be addressing its long term conventional resource needs, especially for the FY 2020 through 2030 timeframe. This is primarily due to the operating license for SONGS expiring in FY 2022 and the contract with IPP expiring in FY 2027. Together, these two baseload resources make up roughly 55 to 60 percent of Riverside's power supply portfolio, accounting for about 175 MW of capacity and producing approximately 1,300 GWh annually. Additionally, Riverside also has an ongoing unmet annual power supply need of about 15 to 20 percent.

While the operating license for SONGS is set to expire in 2022, there is an opportunity for this license to be extended beyond 2022. However, to account for future uncertainty, Riverside intends to explore potential replacement options.

Unlike the SONGS operating license, the IPP contract cannot be extended beyond 2027 due to California Senate Bill 1368, which was signed into law on September 29, 2006. This law prohibits California utilities from signing new long-term contracts with generation plants whose greenhouse gas emissions factors exceed that of a baseload combined-cycle natural gas plant, and the emissions factor for IPP well exceed this mark. Due to Senate Bill 1368's prohibition to renew the IPP contract when the existing contract expires in 2027 if IPP generation remains in its current configuration, i.e., coal generation , Riverside is currently exploring other resource options on its own and through SCPPA. The options that Riverside has begun exploring so far include but are not limited to participating in a natural gas repowering project at the current IPP site and/or purchasing a share in a local combined cycle natural gas plant. Riverside will be working diligently over the next 5 years to find cost-effective, efficient and low emissions baseload resources to replace IPP by or before 2027.

8.3 Energy Efficiency and Other Demand-Side Programs

As mentioned above, Riverside is committed to meeting the AB2021 targets for energy efficiency and other demand-side programs. Riverside is continually reviewing its existing programs and services to ensure cost effectiveness and to respond to the changing needs of our customers as well as the introduction of new energy efficiency technologies. Riverside will provide the required financial budget to meet the AB2021 targets and will continue to develop new cost-effective programs that yield energy savings necessary to achieve the goals set forth by AB2021.

8.4 Energy Storage

California Assembly Bill 2514 (AB 2514), signed by the governor of September 29, 2010, requires California's publicly-owned utilities to adopt an energy storage system procurement target, if determined to be appropriate, by October 1, 2014. If a utility elects to adopt procurement targets under AB 2514, the utility must achieve these targets by December 31, 2016 and December 31, 2021.

On February 17, 2011, as per AB 2514, the Riverside Board of Public Utilities opened a proceeding to consider viable and cost-effective energy storage technologies and determine if energy storage targets should be adopted. Riverside is currently investigating energy storage technologies and assessing their viability and cost-effectiveness for Riverside's electricity system. Riverside will continue to explore energy storage and be prepared to make a recommendation regarding energy storage targets to the Riverside Board of Public Utilities by the October 1, 2014 deadline.

8.5 Transmission Resources

Riverside has historically relied on a single point of electrical interconnection to California's bulk power transmission system, but Riverside is currently pursuing the creation of a second point of interconnection to significantly enhance its system reliability and import capacity. Riverside has an interconnection agreement with SCE for the construction and interconnection of a new 230-69 kV transmission substation which will provide another interconnection of Riverside's system with SCE's transmission facilities. The project is called the Riverside Transmission Reliability Project (RTRP). RTRP has undergone an environmental review, and the resulting environmental report was approved by the Riverside City Council on February 5, 2013. RTRP will now undergo consideration by the California Public Utilities Commission. The project is not expected to be completed until at least 2018.

9 CONCLUSIONS

This IRP details Riverside's power supply, demand-side, and transmission resource planning since the last 5-year Integrated Resource Plan submittal in FY 2008, and Riverside's ongoing planning efforts through FY 2017. The major goals presented in Riverside's IRP are summarized below:

1. Continue to aggressively pursue least-cost, best-fit renewable resources to serve Riverside's load and meet the renewable energy procurement requirements of SB2 (1X) – average of 20% between 2011 and 2013, 25% by 2016, 33% by 2020 and 33% thereafter.

2. Continue to offer and expand the existing selection of energy efficiency and demand-side management programs, increase customer participation, and provide the required financial budget to meet the goals set forth by AB2021.

3. Aggressively explore and pursue cost-effective, efficient, and low-emissions baseload resources to replace those set to expire in the 2020 through 2030 time horizon.

4. Continue to explore energy storage technologies and consider procurement targets to comply with AB 2514.

5. Continue to pursue the development of the RTRP to enhance Riverside's system reliability.

RIVERSIDE PUBLIC UTILITIES

Riverside Overview

- Riverside Public Utilities (RPU) was established in 1895
- Over 106,000 electric and 64,000 water customers
- Peak demand hit system high of 604 megawatts in August 2007
- Annual energy use is approximately 2,100 gigawatt-hours
- RPU employs just under 600 full-time employees
- Service territory is approximately 90 square miles

Mission: The City of Riverside Public Utilities Department is committed to the highest quality water and electric services at the lowest possible rates to benefit the community.

Our Ten-Year Vision: Our customers will recognize Riverside Public Utilities as a unique community asset with a global reputation for innovation, sustainability and an enhanced quality of life.

Core Values: safety, honesty and integrity, teamwork, professionalism, quality service, creativity and innovation, inclusiveness and mutual respect, community involvement, and environmental stewardship.

Achievements: In July 2010, the RPU General Manager launched the Environmental and Economic Effectiveness Effort (E4 Plan). This 2-year plan addressed difficult economic times through short-term electric rate freezes, economic development efforts, and a focus on green programs. The E4 Plan initiative also highlighted aggressive customer outreach, upgrades to RPU websites, Automated Meter Reading (AMR) implementation, paperless billing, renewable solar energy and energy efficiency programs. In 2012 the 2-year E4 Plan was completed with an impressive list of accomplishments including:

- A successful 2-year electric rate freeze.
- The installation of over 104 new photovoltaic systems within RPU's service territory resulting in an additional 3.3 megawatts of rooftop solar distributed generation.
- 1,280 new jobs created and 500 jobs retained.
- Over 19 million kWh in total energy savings
- Over 2,000 homes improved through energy efficiency measures

In 2012 RPU's innovative energy efficiency programs exceeded established goals, garnered national attention and assisted customers in saving on their utility bills while reducing energy consumption. In addition, RPU partnered with the Southern California Gas Company to install energy efficiency upgrades for low-income customers through the Energy Savings Assistance Program (ESAP) and reached over 1,000 small business customers providing up to $1,500 in free energy and water efficiency measures through the creation of a new Small Business Direct Installation (SBDI) program.

Additional Public Benefits Program Accomplishments include:

- RPU continues to use all PBC monies to support rebate programs, direct installation programs, low income programs, research and development and renewable energy projects that give back to the community.
- RPU's "Tree Power" program provided more than 117,000 shade trees to its customers since 2001.

- RPU assisted over 7100 customers through the SHARE low income assistance program.
- RPU received the 2011 Outstanding Energy Management Award from the American Water Works Association (AWWA) for the ongoing in-system study of a water pipe that generates electricity.
- Riverside was chosen to Showcase Green/Sustainability Accomplishments at the National League of Cities Event sharing information about programs which helped to strengthen the local economy and protect our natural resources and was awarded the California Sustainability Alliance's 2011 Sustainability Showcase Award for Local Government.
- RPU's "Power Partners" Voluntary Load Shed Program was created and implemented. Twenty-five (25) Key Account customers committed to 14 MW's of load shed capability.
- Riverside Public Utilities' (RPU) Environmental and Economic Effectiveness Effort (E4) Plan received an Award of Merit by the California Association for Local Economic Development (CALED) in their 2011 Awards of Excellence Program.
- The City of Riverside has achieved "Silver" status as a California Green Community for its commitment to sustainability.

RPU's continued investment in proactively marketing its wide array of energy efficiency programs to its customers has played a significant role in maintaining a high level of program participation despite the slow economic recovery.

The "pilot" Whole House Energy Efficiency Rebate Program initiated by ARRA funding retrofitted 244 homes and was the first of its kind in the nation. It helped to establish funding and incentive levels necessary to continue the program using PBC funds while local businesses utilized the program as an important marketing tool to remain viable during the economic downturn. As additional ARRA funds became available the ARRA funded program was extended through the end of fiscal year (June 30, 2012) retrofitting an additional 157 homes. This combination of ARRA and PBC funding has resulted in 1,369 participants in the Whole House Program since program inception in FY 09-10.

Although RPU programs continue to be successful in terms of customer participation numbers and the reported energy savings, many economic and programmatic challenges remain:

- RPU retail energy sales measured in kilowatt hours for FY 11/12 were just slightly above 2.1 billion kWh which is still below the nearly 2.2 billion kWh sold in FY 07/08. This is due in part to high commercial vacancy rates in certain market sectors such as office properties, fluctuations in average temperature, impact of "green" initiatives and successful EE programs. As the PBC surcharge is proportional to retail kWh sales, the PBC funding supporting RPU programs continues to be reduced while program demands have increased.
- The local economy, including both job and housing markets, has remained a challenge continuing to make investment in energy efficiency measures difficult for many Riverside homeowners and businesses. Although slowly improving, Riverside's unemployment rate is still higher than both the national and state averages.
- No cost/low cost small business direct install programs, CFL distributions and Free ShadeTree coupons have helped RPU to continue meeting its energy efficiency goals and helped to stimulate the economy. The increasing costs of continuing such programs at current funding levels may become a challenge in the future.

- While, RPU's low-income program (SHARE) participation levels have continued to decline from the FY 09-10 program participation high of 9,574, the funding level still exceeded $1,000,000 for the fourth consecutive year, which amounts to 14% of all PBC spending for FY 11-12.
- The California Solar Initiative (SB1) requires that RPU provide $2.5M annually from public benefit funds that could otherwise be spent on energy efficiency programs, research and development, and low income programs. RPU solar rebate programs currently represent 40% of all PBC expenditures. Both the commercial and residential PV programs have been very popular. Riverside achieved a major milestone by surpassing the 4 megawatt (MW) mark of clean, renewable energy that is produced by solar generation projects throughout the city.

RPU continued to focus its commercial energy efficiency programs on large Key Account customers as well as small businesses. The Small Business Direct Installation (SBDI) Program included an energy audit to identify and prioritize the energy efficiency measures best suited for the individual business. RPU contractors provide the direct installation of a variety of energy efficiency measures at little or no cost to the customer. RPU also piloted a Keep Your Cool program which specifically targets grocery stores, convenience stores, delis and markets with a variety of energy efficiency measures designed to reduce costs associated with refrigerated food and beverage storage and sales displays.

Riverside is committed to meeting the annual energy efficiency (EE) and conservation goals it has established through AB2021 for energy and demand reduction. The revised energy reduction goal of 232,503 megawatt-hours (MWh) over the next 10 years represents 1% of the revised Load Forecast completed in 2010. RPU will provide the required financial budget to meet these targets and will continue to develop new cost-effective programs that yield energy savings necessary to achieve the goals set forth by Assembly Bill 2021 (AB2021).

Customer Incentives

RPU is continually reviewing the programs and services offered to ensure cost effectiveness and to respond to the changing needs of our customers as well as the introduction of new energy efficiency technologies. The successful residential Whole House Rebate Program has now been fully transitioned to a PBC funded program now that ARRA funding has been exhausted. RPU residential programs continue to experience wide support and participation by customers. Continued emphasis on commercial energy efficiency programs to increase business participation in an effort to meet annual energy savings goals has resulted in new commercial programs such as the introduction of an HID Lighting Retrofit Program, the Commercial Weatherization Program and the Small Business Direct Installation (SBDI) Program. Below is a list of major residential and commercial energy efficiency programs currently offered by RPU. This list also highlights other programs and services offered by RPU in the areas of renewable energy, research, development and demonstration and low income assistance.

Commercial Rebate Programs

- Air Conditioning Incentives – rebates for replacement or first time purchase of energy efficient AC units.
- Energy Star – rebates for purchase of Energy Star refrigerators, dishwashers, commercial clothes washers, solid door refrigerator/freezers.
- Lighting Incentive – rebates for kWh savings on installation of energy efficient lighting.

- New Construction Incentive – rebates for energy savings exceeding Title 24 standards for new construction projects pre-approved by Riverside Public Utilities.
- Pool and Spa Pumps Incentive – rebates for purchase of qualifying energy efficient pumps and motors.
- Tree Power – rebates for purchase and planting of up to 5 qualifying shade trees per year.
- Thermal Energy Storage Incentive – feasibility study and incentives available for use of Thermal Energy Storage based on guidelines.
- Performance Based Incentive – rebates for customers who can demonstrate a kWh savings based on custom energy-efficiency measures.
- Commercial Photovoltaic Incentive – rebates for customers who install PV on their business to reduce peak load.
- Energy Innovations Grant for Post-Secondary Educational Institutions – for the funding of research, development and demonstration programs for the public interest to advance science or technology in electric-related projects in the institutions of higher education within the city of Riverside.
- Custom Energy Technology Grants – Grants are awarded for research, development, and demonstration of energy efficiency projects that are unique to the business or manufacturing process.

Direct Installation Commercial Programs

- Small Business Direct Installation (SBDI) – provides an audit and up to $1,000 in free energy-efficient measures including high efficiency lighting retrofits, HVAC Tune Ups, LED or electroluminescent Exit Sign replacement, Occupancy Sensors, Strip-Curtains for walk-ins and installation of vending/cooling misers.
- Keep Your Cool – provides targeted businesses a free evaluation of the efficiency of existing refrigeration equipment and the installation of a variety of energy efficient measures including door gaskets, strip curtains, door closures, LED case lighting, electric motors and controls.

Residential Rebate Programs

- Energy Star – rebates for purchasing Energy Star rated appliances that use less energy and water.
- Cool Cash – rebates for replacing Central Air Conditioners with a SEER rating of 15 or above.
- Tree Power – rebates for purchasing and planting of up to 5 qualifying shade trees per year and 1 free qualifying shade tree coupon printed on the March back of the bill.
- Residential Photovoltaic Incentive – rebates for customers who install PV on their home to reduce peak load and offset high electricity bills.
- Pool Saver – rebates for purchasing efficient pool pump motor, and monthly credit for using pool pumps during off-peak hours.
- Weatherization – rebates for installing attic insulation or wall insulation, standard rebates for duct replacement, duct testing/sealing, window replacement, window film, solar and standard attic fans, whole house fans and cool roofs.
- Whole House (ARRA/PBC Funded) – rebates for completing two or more energy efficiency measures at a time. Points are awarded for each type of measure and then multipliers are given at specific point intervals on a sliding scale to encourage implementation of more energy efficiency measures.

Special Residential Rates and Customer/Community Services

- Appliance Recycling – free recycling service for old inefficient refrigerators.
- Utilicare – provides reduced rates to households that require specific types of life support medical equipment.
- SHARE – credits up to $150 toward electric deposit or bill payment assistance for qualified low-income applicants annually.
- Green Power Premium – allows customer to donate an additional 2 cents per kilowatt hour above their current kWh rate to assist in purchasing renewable energy resources.
- Community Education and Outreach – RPU offers a comprehensive Education Program for Schools. This program targets 4th,5th and 6th grade students by educating students on energy, water and conservation through classroom presentations and mobile standards-based science lab kits that integrate into existing science classroom curriculum.

Photovoltaic Efforts (Solar)

RPU continues to promote residential and commercial participation in its renewable energy programs. In support of Senate Bill 1 (SB1) RPU has allocated a budget of $2.5 million annually through December 31, 2016 for customer installed systems.

RPU has a goal of installing 20 megawatts of local photovoltaic by 2020. During the last year there were 144 residential installations totaling 694 kW AC and 9 non-residential systems generating 559 kW AC of renewable solar energy. RPU currently has over 4 megawatts of photovoltaic systems installed and operational.

Research, Demonstration and Development (RD&D)

RPU continues to invest in RD&D programs through local higher education institutions, with a $100,000 grant to the University of California at Riverside (UCR) College of Engineering, Center for Environmental Research and Technology (CE-CERT) for research designing efficient miniaturized energy-storage devices. In addition, RPU granted $100,000 to California Baptist University, College of Engineering to fund research related to solar powered air conditioning systems. A Custom Energy Technology Grant was awarded to the City of Riverside Parks, Recreation and Community Services Department for installation of SolarBee Solar Powered Floating Aeration Devices to be installed at Fairmount Park's lakes. These devices are estimated to save over one-half million kilowatt hours per year. RPU also participates in SCPPA-related RD&D efforts and will continue to explore future research demonstration and development opportunities.

Demand Response/Smart Grid

In addition to the Power Partners voluntary load curtailment program implementing 14 megawatts of voluntary load shed capability for the summer of 2012, RPU continues to implement a commercial time-of-use rate to encourage off-peak energy use by its large customers. RPU is evaluating other demand response measures such as Smart Grid technology and Ice Bear applications.

Low Income Assistance

RPU continues to assist low income families through the Sharing Households Assist Riverside's Energy (SHARE) fund. RPU customers can donate a specified amount of money each month to the SHARE fund which is then supplemented by PBC monies to credit up to $150 toward electric deposit or bill payment

assistance for qualified low-income applicants annually. In FY 11-12 over $1,075,000.00 in credits were applied to assist over 7,100 low income families.

Evaluation, Measurement, and Verification (EM&V)
Riverside Public Utilities is committed to providing on-going evaluation, measurement and verification efforts for its energy-efficiency programs in support of AB2021. RPU has continued to provide feedback to CEC staff and their consultant regarding the proposed Recommended Evaluation Guidelines for Publicly Owned Utilities.

As part of the City's annual audit process RPU requested a separate program audit pertaining to its Energy Efficiency programs. The goal was to review rebate processes, procedures and supporting documentation. The final report includes findings and recommendations for program improvement.

RPU consistently performs the following in support of EM&V activities:

- An onsite inspection rate of no less than 10 percent for all residential program participants, performed by RPU staff and contractors.
- A pre- and post-inspection for 100% of all commercial rebate participants, including a review of historical energy usage and energy-saving calculations.
- All residential and commercial solar PV installations are field inspected and verified by city personnel for program compliance, system inter-connection standards and rated production output.
- Contracted with outside engineering firms to verify claimed energy savings on large, complex or technical commercial projects prior to issuing an incentive.
- Audits and installations performed by third-party contractors for RPU direct installation programs have high inspection rates that are performed by the consultant and RPU staff.
- Refrigerator recycling program administered by Appliance Recycling Centers of America (ARCA) assures proper verification when the contractor is picking up old appliances for recycling.

Stimulus Update (ARRA Funding)
The City of Riverside was allocated $2,499,810 in Energy Efficiency Community Block Grant (EECBG) under the American Recovery and Reinvestment Act (ARRA) for energy measures.

The following energy projects were submitted and approved under the grant for the EECBG funding through ARRA:

- Government Building Retrofits – $308,030 was allocated for projects to include boiler and water pump replacement; heating, ventilating and air conditioning unit upgrades; and building automation for eight city facilities. Six of the eight projects have been completed and the remaining two are underway.
- Whole House Rebate Program – $714,000 was allocated to create a pilot program offering a "whole house" approach to energy efficiency through an elevated rebate program that provides greater incentives as more energy efficient measures are added to a home. The stimulus funded program improved energy efficiency in 244 homes. Monies left over from other projects were reallocated to the Whole House Rebate Program and the ARRA program was extended through the end of June, 2012 retrofitting an additional 157 homes.
- Personal Computer Management Software Rebate Program – $156,940 was allocated for this pilot program which offers software rebates allowing businesses to turn off PCs automatically saving

energy and money. The City of Riverside, Alvord Unified School District and Riverside Community College have installed the software on over 6,000 personal computers to date.

- Greenhouse Gas Community Inventory – $48,650 was allocated for URS Corporation to complete a community GHG emissions baseline to compliment a previously funded government facilities study.
- Solarized Trash Compactors and Recycling – $153,040 in grant funds were used to purchase and install 25 new trash containers and recycling units in public areas throughout the city. The compactors use solar energy to power compaction of the trash reducing the number of trips needed to empty the containers.
- PV Electric Vehicle Charging Storage System – $157,000 was allocated for the proposed project which will use a photovoltaic charging system to charge 12 golf carts, off-setting expensive peak power and providing green renewable energy.
- Street Lighting Retrofit LED – $254,050 was allocated to provide funding for approximately 200 additional energy-efficient light-emitting diode (LED) streetlights to improve public safety, lower energy use and save money.
- Lighted Street Name Sign Reduction – $450,030 was allocated to install approximately 1,000 "Diamond Grade 3 (DG3)" or LED street name signs to reduce maintenance costs and energy use.
- Specific Plan Updates – $258,070 was allocated to update specific plans to ensure integrated designs which incorporate elements to create an energy efficient/sustainable environment by reducing vehicle miles traveled and GHG emissions.

Riverside – Summary Energy Efficiency Programs, FY2012

Riverside		Resource Savings Summary						Cost Summary		
Program Sector (Used in CEC Report)	Category	Units Installed	Net Demand Savings (kW)	Net Peak kW Savings	Net Annual kWh Savings	Net Lifecycle kWh savings	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)
Appliances	Res Clothes Washers	1,338	181	181	70,513	846,151	504	$100,350	$2,151	$102,501
HVAC	Res Cooling	15,361	732	749	2,279,922	67,231,719	44,326	$496,592	$285,117	$781,709
Appliances	Res Dishwashers	748	63	63	18,371	202,080	120	$37,400	$485	$37,885
Consumer Electronics	Res Electronics									
HVAC	Res Heating									
Lighting	Res Lighting	18,697	1,527	210	1,320,462	6,651,098	3,773	$46,020	$14,097	$60,117
Pool Pump	Res Pool Pump	144	9	9	36,979	369,792	210	$28,800	$882	$29,682
Refrigeration	Res Refrigeration	3,745	266	266	1,251,193	7,849,021	4,430	$555,354	$17,891	$573,245
HVAC	Res Shell	283	52	52	71,543	1,399,993	904	$36,900	$5,972	$42,872
Water Heating	Res Water Heating									
Comprehensive	Res Comprehensive	789			1,056,909	12,673,022	7,154	$824,050	$29,427	$853,478
Process	Non-Res Cooking									
HVAC	Non-Res Cooling	2,230	289	315	634,774	12,098,338	7,649	$142,246	$37,575	$179,820
HVAC	Non-Res Heating									
Lighting	Non-Res Lighting	8,165	1,560	1,560	7,801,850	78,018,500	46,208	$690,868	$206,659	$897,526
Process	Non-Res Motors	4			267	1,068	1	$140	$2	$142
Process	Non-Res Pumps									
Refrigeration	Non-Res Refrigeration	11	7	7	170,280	1,021,680	569	$45,523	$2,224	$47,747
HVAC	Non-Res Shell									
Process	Non Res Process									
Comprehensive	Non Res Comprehensive	11,551	2,074	2,074	6,050,786	53,741,869	30,659	$384,681	$127,531	$512,212
Other	Other	143,373			480,136	6,189,605	3,796	$356	$19,396	$19,752
SubTotal		206,439	6,762	5,487	21,243,985	248,293,936	150,302	$3,389,280	$749,409	$4,138,689
T&D	T&D									
Total		206,439	6,762	5,487	21,243,985	248,293,936	150,302	$3,389,280	$749,409	$4,138,689

EE Program Portfolio	TRC Test	**2.99**
	PAC Test	**7.47**