



**Department of Energy**  
Western Area Power Administration  
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**JAN - 3 2012**

Via E-mail: [charlie.duckworth@srpnet.com](mailto:charlie.duckworth@srpnet.com)

Mr. Charles Duckworth  
Senior Director Energy Management  
Salt River Project  
P.O. Box 52025  
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Phoenix, AZ 85072-2025

Re: Salt River Project's 2013-2017 5-year Integrated Resource Plan

Dear Mr. Duckworth:

Thank you for submitting your 5-year Integrated Resource Plan (IRP) to Western Area Power Administration (Western). This report is dated December 19, 2012, and covers reporting time period of fiscal year 2013-2017 from May 1, 2012 to April 30 2017. This is your formal notice that this report has been reviewed and approved.

Data from all customers will be consolidated and included in our reports provided to Congress and others.

For annual updates, please use our automated on-line reporting system at <http://www.wapa.gov/FormsAuth/Login.aspx?ReturnUrl=/irpsubmit/irpsubmit.aspx>.

Western has a wide range of information on our Energy Services web site, [www.wapa.gov/es](http://www.wapa.gov/es), which may help you implement your plan. You may also call our PowerLine at (800) 769-3756 for personal assistance. If you do not have access to the web site, have questions on the guidelines, or need assistance in implementing your report action plan, please contact me at (602) 605-2659 or [colletti@wapa.gov](mailto:colletti@wapa.gov).

Please do not hesitate to call if I may be of further assistance in this or any other Energy Services related matter.

Sincerely,

A handwritten signature in cursive script that reads "Audrey Lynn Colletti".

Audrey Lynn Colletti  
Public Utilities Specialist

Email cc: Jayme Hobe, [jayme.hobe@srpnet.com](mailto:jayme.hobe@srpnet.com)

# **Integrated Resource Plan FY 2013**

December 19, 2012

Joint Filing to the Western Area Power Administration  
by:

Salt River Project  
Town of Gilbert  
Fort McDowell Yavapai Nation  
Salt River Pima-Maricopa Indian Community

This fiscal year 2013 Integrated Resource Plan has been reviewed and approved by the following authorized representatives:

 12-19-12  
Charles B. Duckworth                      Date

Senior Director  
Energy Management  
Salt River Project

If you have any questions about this plan, please contact:

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**SALT RIVER PROJECT, SALT RIVER PIMA-MARICOPA INDIAN COMMUNITY,  
FORT MCDOWELL YAVAPAI NATION, AND TOWN OF GILBERT WESTERN AREA  
POWER AUTHORITY INTEGRATED RESOURCE PLAN FILING**

Western Area Power Authority (WAPA) customers with Federal Hydro Power allocations are required to periodically file Integrated Resource Plans (IRP) with WAPA. WAPA uses this information to help demonstrate the stewardship of these allocations by its customers.

This requirement was initially implemented for customers receiving Colorado River Storage Project allocations under the 1989 Marketing Program, but subsequently extended to all WAPA customers under the Energy Policy Act of 1992.

This report describes SRP's long-range plan for providing electricity to the customers in its service territory. Customers are encouraged to submit a single IRP for multiple entities when circumstances warrant. This submittal is being provided on behalf of SRP, the Salt River Pima-Maricopa Indian Community, the Fort McDowell Yavapai Nation, and the Town of Gilbert.

As background on this joint filing, SRP fully serves the loads of the Salt River Pima-Maricopa Indian Community and Fort McDowell Yavapai Nation through the SRP system, and also serves the municipal loads of the Town of Gilbert. To facilitate receiving the benefit of their allocations WAPA delivers these entities' allocations to SRP and SRP passes the benefits along to the respective entities.

In recognition of this load serving and allocation relationship, SRP, the Salt River Pima-Maricopa Indian Community, Fort McDowell Yavapai Nation, the Town of Gilbert, and WAPA have agreed that filing a single response under WAPA's IRP filing requirements, as represented by this report, is appropriate.

## **OVERVIEW**

### **Salt River Project**

The Salt River Project Agricultural Improvement and Power District (SRP) is a water and electric utility serving customers in a three county region in central Arizona, including a significant portion of the Phoenix metropolitan area with annual operating expenses that exceed \$2 billion. SRP is one of the nation's largest public power utilities. SRP's focus is serving its customers and managing its resources, these two fundamental principles define SRP's past, present, and future and reflect SRP's mission of improving the quality of life in the Valley and throughout Arizona.

SRP delivers nearly one million acre-feet of water to customers annually, managing a 13,000 square mile watershed and operating an extensive delivery system that includes reservoirs, wells, canals and irrigation laterals. As a leader in Arizona's water delivery system, SRP is centrally involved in developing plans to meet the water supply and demand challenges of a growing population.

SRP also provides electricity to more than 900,000 customers. In fiscal year (FY) 2012 SRP's customers consumed more than 26 trillion kilowatt-hours (kWh) of electricity and required more than 6,300 megawatts (MW) of generation to meet coincident demands during the peak period. SRP's diverse resource portfolio includes nuclear, coal, gas, hydro, wind, solar, geothermal, biomass, landfill gas, demand response programs, and energy efficiency initiatives. SRP owns and operates thousands of miles of transmission and distribution facilities that deliver the electricity produced by these resources to SRP's customers.

SRP's corporate mission is to "deliver ever-improving contributions to the people we serve through the provision of low cost, reliable water and power, and community programs, to ensure the vitality of the Salt River Valley." SRP has received numerous JD Power & Associates awards for the provision of excellent service, as judged by the customers themselves.

### **FY13 Resource Plan**

The Resource Plan information contained within this report covers a five-year time horizon (FY13 through FY17). SRP's fiscal year begins May 1 of each year.

SRP plans to meet its future resource needs through a diverse portfolio of short and long-term purchases, integrating more low-carbon and carbon-free resources, including energy efficiency and demand response programs. This plan represents a well balanced approach to meeting SRP's growing customer load at a reasonable cost, while mitigating risks.

Given the dynamic nature of the energy industry and the economic outlook, it is likely that some elements of this plan will change over time in response to challenges facing the electric industry. Some of these challenges include: volatile natural gas and electricity prices, uncertainty about gas and transmission infrastructure, concerns about greenhouse gas emissions, changes in resource costs, and load forecast volatility as well as the magnitude and types of resources required. SRP's resource plan is designed for flexibility to accommodate current conditions while still anticipating future needs.

SRP closely follows both the state and federal regulatory and environmental policy direction to assess changes that could influence these plans. Resource flexibility, balance, and diversity are key elements of the resource plan that help SRP successfully manage these types of uncertainties. As a public power utility, SRP was founded on the principles of resource stewardship. SRP strives to preserve the balance between serving growing customer needs, managing costs, and protecting natural resources.

## **SRP'S RESOURCE PLANNING OBJECTIVES**

In the electric utility industry, the term "Integrated Resource Planning" refers to the process of planning for customers' future electric service demand and energy requirements. Decisions made within this process have far-reaching impacts on electric utilities, customers, and the society at large. The purpose of this document is to present a projection of SRP's resource needs over the next five years and a strategy for meeting those needs in an ever changing environment. SRP's FY13 Resource Plan has been developed and submitted in compliance with the requirements of the Western Area Power Administration's Energy Planning and Management Program.

SRP's current resource planning process attempts to strike an effective balance among multiple, and often competing, objectives. No single plan can meet every objective equally well. SRP examines many alternative future plans in order to find a plan that best meets a combination of the following resource planning objectives.

### **Ensure Adequate and Reliable Service to Electric Customers**

SRP is committed to serving demand and energy needs of the customers within its service territory. To meet these needs, a portfolio of resource options, including supply-side alternatives and demand-side alternatives, are considered. The selected combination of resources must be capable of meeting future customer demand and energy requirements, as well as the reserve capacity necessary to provide reliable electric service during equipment outages, severe weather conditions, sudden unexpected surges in load, and changing future marketplace conditions. SRP's interest is in the efficient utilization of electricity on both sides of the meter.

### **Provide an Economically Efficient and Environmentally Responsible Resource Mix**

SRP uses multiple decision-making criteria for selecting alternatives for meeting future customer requirements during the course of its resource planning process. SRP examines various resource alternatives to ensure the plan represents the best interests of SRP's customers and the environment.

The resource planning process also identifies a plan that can meet applicable environmental regulations. SRP plans, constructs, and operates its power facilities in a manner that conforms to existing environmental requirements and is responsive to evolving public policy on environmental stewardship. SRP works closely with regulatory agencies and its stakeholders in establishing environmental standards for its facilities that will be protective of public health and the environment.

### **Maintain SRP's Financial Integrity While Providing Energy at Competitive Rates**

SRP recognizes the important role that low-cost, reliable power plays in the economic vitality and standard of living enjoyed by our customer base. SRP's financial integrity is a critical aspect in the preservation of our legacy in providing this value over the long-term. Resource decisions are at the core of SRP's economics, and the impact of these decisions on SRP's financial strength is extensively modeled and considered. The financial consequence of resource decisions are ultimately reflected in the prices our customers pay for energy, capacity, and reliability. To help ensure that

SRP's rates remain competitive, decisions are made from a long-term perspective that values resource diversity and balance.

SRP's approach to managing the costs associated with meeting its Sustainable Portfolio goals is no different. In the pursuit and achievement of these goals, SRP has pursued a very diverse mix of sustainable resources including solar, wind, geothermal, hydro, landfill gas, biomass, energy efficiency, and other demand side programs. With regards to renewables, SRP has taken a measured approach by integrating multiple, smaller projects to take advantage of technological and geographic diversity as well as the decreasing costs of new technologies over time. Moreover, SRP incorporates the cost of integrating variable and intermittent generation technologies into its resource decisions and is currently pursuing a comprehensive study to better understand these costs.

### **Ensure System Reliability**

SRP actively works to ensure system reliability. SRP has a system-wide maintenance program to maintain equipment and keep it in proper working order. SRP, in conjunction with Arizona Public Service Company (APS), performs operating studies annually for the Phoenix metropolitan area to define the maximum load serving capability and the simultaneous import limit. To minimize any other anticipated reliability concerns, SRP studies other factors such as weather and severe contingencies as a proactive measure to ensure system reliability.

SRP is aware that wind and solar generation can be intermittent and therefore, it may be necessary to carry additional operating reserves to maintain load and reliability requirements. For this reason SRP continues to study solar and wind integration to further identify the capacity value it can expect from renewable resources and the operational integration costs of having different levels of penetration on SRP's system. SRP will continue to gain experience in the integration of variable generation as it continues to add resources to meet SRP's sustainable portfolio standard.

SRP is a member of the Southwest Reserve Sharing Group (SRSG), and therefore, is entitled to receive emergency assistance as needed. The amount of assistance varies depending on the size of the unit lost and the loading level of the generator at the time of loss. SRSG is structured such that the combination of contingency reserves carried by individual members plus SRSG's assistance, allows members to comply with Western Electricity Coordinating Council's (WECC) contingent reserve requirements. SRP abides by operating reserve criteria as established by WECC, North American Electric Reliability Corporation (NERC), and SRSG's participation agreement.

### **Maximize Flexibility in Future Resource Acquisition**

The uncertainties presented by customer demand, fuel prices, electric prices in the wholesale marketplace, and the regulatory and political environment can each have a profound impact on resource planning and acquisition. SRP's resource planning efforts place an emphasis on adopting plans that maximize the flexibility for responding to the changing conditions of an uncertain future.

SRP is committed to providing reasonably priced electricity while making investments to preserve fuel diversity, support infrastructure, and meet environmental requirements. Resource alternatives

are evaluated in such a way that total resource value is recognized, helping SRP to make wise resource decisions. Fully integrated costs, including base technology, integration, delivery, and risk premiums are considered so that resources are evaluated on a comparable and comprehensive basis. Understanding the total value and cost of potential resources helps SRP make better resource decisions and maintain reasonable prices.

### **Manage Risk**

SRP has an energy risk management program to limit exposure to risks inherent in normal energy business operations. The goal of the energy risk management program is to measure and report exposure to market risks, credit risks, and operational risks. Specific goals of the energy risk management program include reducing the impact of market fluctuations on retail customer fuel and purchased power costs and the value of excess resources. SRP employs established policies and procedures to meet the goals of the energy risk management program using various physical and financial instruments, including forward contracts, futures, swaps, and options. Risk reduction is the ultimate result of SRP's hedging practices.

### **Summary**

Providing instantaneous electric service to hundreds of thousands of Arizonans requires advanced planning. Some of the alternatives that SRP could call upon to meet expected future customer demands may take years to bring from the drawing board to reality. The resource planning process identifies resource alternatives and strategies that will enhance SRP's ability to meet customer needs at competitive prices and provide the flexibility to respond to load and industry uncertainty. SRP will continue to develop long-term resource plans in a manner that provides an effective balance of all objectives.

## HOW SRP RETAIL CUSTOMERS USE ELECTRICITY

Unlike other forms of energy, such as gasoline for cars or propane for barbecue grills, electricity is an instantaneous commodity that for the most part cannot be stored. When any SRP customer turns on a light switch, starts a microwave oven, or starts a pool pump, SRP's system for supplying electricity must respond immediately to meet that customer's demand. Thousands of SRP customers make decisions either to use, or stop using, electricity every minute of every day. It is a challenge to accurately predict how much electricity customers will use, and when they will use it.

The amount of electricity that SRP's customers use at any moment is referred to as "load" or "demand." The sum of all SRP customers' decisions to either use or not use electricity at any moment is called the Total System Load or Total System Demand. This Total System Load is usually measured in units of millions of watts, or megawatts (MW). As a result of customers' decisions during FY12, SRP supplied at least 1,796 MW during all hours of the year.

Like other Sunbelt utilities, SRP is a "summer peaking" utility. This means that each year, demand for SRP electricity is greatest during Arizona's hot summer months. Central air conditioning, a fixture in the southwestern desert lifestyle, is a significant reason that SRP's greatest demand occurs during the summer. The highest single hourly demand that occurs each year is referred to as the Total System Peak Load. SRP's Retail Peak Load for FY13 was 6,663 MW and occurred on August 8, 2012.

SRP's highest hourly load during a year can be described as a needle peak. This means the annual peak load tends to spike well above other hourly loads. SRP does not experience consistent, level hourly loads. The annual peak occurs during the summer months and is usually driven by extreme weather conditions. Area temperatures can rise above 110 degrees, and the need to air condition and refrigerate spaces causes the loads to spike.

For example, during the summer of 2012 (FY13), the highest daily peak load was 6,663 MW on August 8. On that same day, the lowest hourly load was 3,490 MW. SRP's load increased 3,173 MW from lowest to highest to spike at 6,663 MW. The next highest daily peak that summer was 153 MW (2.3%) lower at 6,510 MW on August 12. The third highest daily peak was 6,476 MW and the fourth highest was 6,445 MW. The annual peak load not only "spikes" during the day in which it occurs, but usually it is well above other daily peaks during the summer.

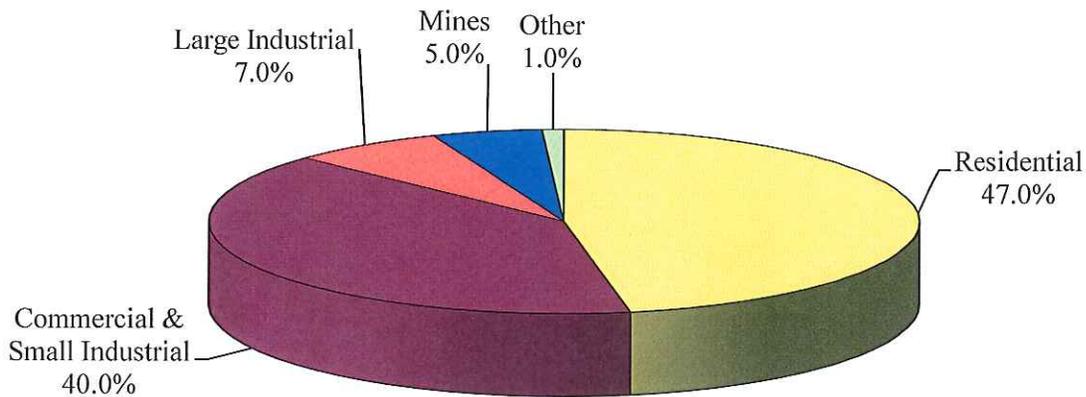
Historically, SRP's highest loads have occurred during only a limited number of hours each year. While SRP plans to meet all of its customers' requirements, a resource acquired solely for the purpose of meeting customers' demands during these peak hours could conceivably sit idle during the remainder of the year. Therefore, resource alternatives such as summer season purchases, time-of-use pricing and demand response programs that focus primarily on this characteristic of SRP's electric customer needs are carefully analyzed and considered in the resource planning process.

The amount of electricity that SRP's customers use during a measured unit of time is referred to as "energy." Since the industry standard quantity of time is an hour, energy is usually measured in units of thousands of watt-hours (kWh), millions of watt-hours (megawatt-hours (MWh)), or billions of watt-hours (gigawatt-hours (GWh)). Each month, SRP customers are billed for the amount of

energy they use. The sum of all SRP customers' decisions to use electricity during a particular time frame is called Total System Energy. During FY12, the Total Retail System Energy sales were approximately 26,600 GWh.

SRP currently serves approximately 957,000 customers (as of April 2012) in five customer classifications: (i) residential; (ii) commercial and small industrial; (iii) large industrial; (iv) mines; and (v) other. Residential customers comprise more than 90% of the total customer base. Energy used by the residential and commercial and small industrial classes make up the largest share, almost 90% combined, of Total Retail System Energy. The strongest growth in electricity use over the next six years is expected to be in the large industrial class, with modest additional growth in the other classes.

**Figure 1**  
**Share of Total Retail System Energy**



Over recent years, SRP has focused on including in its planning the impacts of external forces that may affect the decisions of SRP customers. These include energy efficiency programs, distributed generation, demand response, the availability of electric vehicles, and federal standards for heating, ventilation, and air conditioning (HVAC), and lighting.

## **EXISTING ELECTRIC UTILITY SYSTEM INFRASTRUCTURE**

In the early 1900s, agricultural landowners in the greater Phoenix area formed the Salt River Valley Water Users' Association (Association). When these landowners initially pledged their lands as collateral for the construction of Theodore Roosevelt Dam, electric power generation was incidental. The primary concern of the Association was the delivery of water for agricultural purposes.

Water continues to play an essential role in the Valley but as the area has moved steadily toward urbanization, the fundamental nature of SRP's business has changed considerably. To serve electric customers, SRP currently utilizes a diverse portfolio of resource options that have developed over time as the demand for power grew in SRP's service territory. SRP utilizes a combination of hydroelectric, natural gas/oil fired, coal, renewable resources, energy efficiency, demand response, and nuclear facilities to meet its customers' demands.

### **Hydroelectric Facilities**

Following the completion of Theodore Roosevelt Dam in 1911, the Salt River Valley Water Users' Association added five other conventional hydroelectric (hydro) units at three other sites in the late 1920s and early 1930s. Since then, all of the original units have been refurbished, and other units have been added. Today SRP has six conventional hydro units and two pumped-storage units on the Salt River and three canal hydro units that provide 270 MW of generating capacity.

SRP's hydro system is operated on a seasonal basis to maximize the benefit for SRP's electric customers while also meeting the fluctuating seasonal demands of water customers. Consequently, most of the electricity generated by SRP's hydro system is produced during the summer months, May through October.

SRP also receives energy from several federal hydro projects, including the Hoover Project, the Parker Davis Project, and the Colorado River Storage Project (CRSP). SRP's summer season allocation of capacity from these projects totals 124 MW of generating capacity.

### **Natural Gas/Oil Facilities**

As the Phoenix metropolitan area grew in the post-World War II era, SRP constructed additional generating capacity in the Valley to meet the increasing demand for electricity. In the 1950s and 1960s, SRP constructed two gas-fired steam units at the Kyrene facility and three gas-fired steam units at the Agua Fria facility. Currently, Kyrene's two gas-fired steam units are off-line. Agua Fria's three gas-fired steam units provide about 407 MW of summer season capacity.

As the Valley continued to boom in the early to mid-1970s, SRP added three combustion turbines at the Agua Fria site and four<sup>1</sup> combustion turbines at the Kyrene site, which currently provide about 384 MW of summer capacity. In addition, SRP developed a new Santan facility with four combined-cycle units that currently provide about 368 MW of summer season capacity.

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<sup>1</sup> One combustion turbine was sold back to the vendor in 1996.

As the Valley has continued to grow, SRP has grown with it. SRP has added four new combined-cycle facilities to its existing resource portfolio. In 2001, SRP purchased the Desert Basin plant from Reliant Energy. Desert Basin is a two-on-one combined-cycle facility with 577 MW of summer season generating capacity and is located in Casa Grande, Arizona, approximately 40 miles southeast of the Phoenix metropolitan area. In October 2002, Kyrene Unit 7, a combined-cycle plant, became operational with a summer season generating capacity of 250 MW.

In addition to the Desert Basin and Kyrene facilities, SRP constructed two additional combined-cycle plants at Santan to keep pace with rapid growth in the East Valley. Santan Unit 5 became operational in April 2005, and Santan Unit 6 became operational in March 2006 with a combined summer season capacity of 859 MW.

Together, Santan Units 5 and 6, Kyrene 7, and the Desert Basin plant provide the majority of SRP's Valley-based generation. The older steam and combustion turbine units at Kyrene and Agua Fria operate primarily to provide additional capability to meet peak load during the summer season.

### **Coal Facilities**

In the late 1960s and early 1970s, SRP realized that expansion of its Valley generating facilities would not be sufficient to meet growing customer demands for electricity and thus participated in the construction of a number of large, coal-fired generating facilities. Since 1969, SRP added electrical generation from 12 coal-fired units representing about 2,203 MW of summer season generating capacity.

As the mainstay of today's system, SRP's primary coal plant interests are in the jointly owned Navajo Generating Station and solely owned Coronado and Springerville Unit 4 Generating Stations. Together, the six units at these facilities account for over two-thirds (1,667 MW) of SRP's coal-fired summer season capability. SRP also owns interests in the Four Corners plant in New Mexico and the Craig and Hayden plants in Colorado.

### **Nuclear Facility**

Like many other Sunbelt utilities, in the early 1970s, SRP faced extremely high population and economic growth rates and expected more of the same during the 1980s. Thus, after extensive study and consideration, SRP decided to participate in the Palo Verde Nuclear Generating Station (Palo Verde) as a means of meeting growing electric customer demand.

As a 17.49% owner in Palo Verde, SRP depends upon nuclear generating capability to provide approximately 688 MW (summer season capability) to help meet customer load requirements. Palo Verde's operating costs are extremely low in comparison with other facilities, including base-load coal plants. Palo Verde is designed to produce electricity 24 hours per day, 365 days per year for all of its participant owners. For this reason, the availability of Palo Verde continues to be very important for both SRP and its customers.

## **Existing Generation Asset Management**

With the exception of Palo Verde and the combined-cycle units, every existing SRP generating facility is at least 30 years old, and some, more than 45 years old as of 2012. Despite the age of these resources, SRP currently does not plan for the retirement of any power plant facilities during the five-year planning horizon.

SRP's existing generation assets have been and will continue to be an integral part of its long-term resource plans. These generating stations historically have achieved high availability and low forced outage rates as compared to the industry averages. This performance is largely attributed to prudent operational and maintenance practices. Sustaining and improving this performance will be achieved by continuing a focused effort on preventative, predictive, and corrective maintenance activities. By combining these practices with the ongoing application of engineering and technology improvements, SRP ensures the future economic and operational value of existing assets is maintained.

## **Purchased Power**

SRP supplies a portion of its energy and demand requirements with purchased power from several sources. Approximately 9.5% of the energy requirements in FY13 were met with long-term power purchases and an additional 2.0% were met with short-term purchases.

SRP has a long-term purchase agreement with Tucson Electric Power that provides 100 MW of firm power. This contract will expire in FY17. Additionally, SRP has a 30-year agreement with Tri-State Generation and Transmission Incorporated for 100 MW coal-fired generation from Springerville Unit 3 that will expire in 2036. SRP has also entered into a long-term power purchase agreement for approximately 551 MW with Coolidge Power LLC through 2031, with an option for a 10-year extension of the agreement. Coolidge Generating Station has 12 simple-cycle, natural gas-fired units that are designed to provide a quick response to peak power demands and provide reserve capacity with the ability to add power quickly to support intermittent resources such as wind and solar generation.

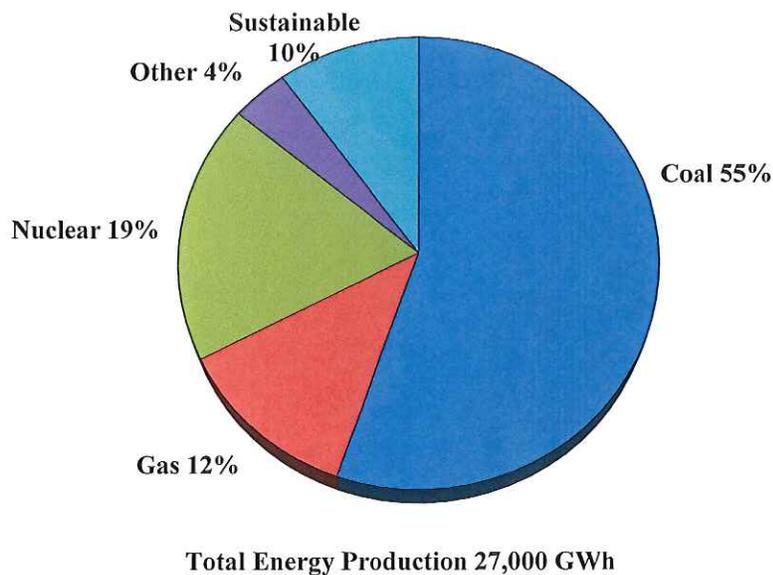
Additionally, SRP has entered into various long-term renewable generation purchase agreements with contract terms of 20-30 years. Two wind power facilities, Dry Lake Wind Phase 1 and Phase 2, began operation in FY09 and FY11 with nameplate capacities of approximately 63 MW and 64 MW, respectively. In FY12, Copper Crossing Solar Ranch, a photovoltaic system and Hudson Ranch Phase 1, a geothermal plant began operation with a capacity of 20 MW and 50 MW, respectively. In FY13, Queen Creek Solar, a 19 MW photovoltaic system began operation. SRP signed for the purchase of an additional 50 megawatts of geothermal from Hudson Ranch II beginning in mid-2015, when the plant is expected to be completed. By FY20, SRP expects to receive additional capacity of approximately 230 MW of solar, wind, hydro, and geothermal renewable energy.

## Existing Resource Mix Summary

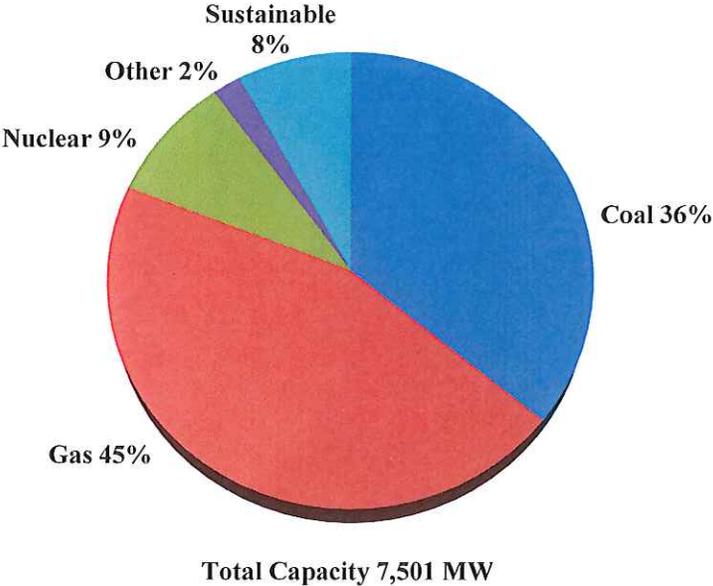
The resource plan covers a 10-year horizon and takes into account a reserve to help ensure reliability for extreme temperatures and unexpected outages. SRP also considers a longer-term view for resources and developing technologies with long lead times. The resource plan results in a diverse resource portfolio that helps SRP effectively minimize risks associated with fuel expense, environmental regulations, market dynamics, and customer demand forecasts.

Figures 2 and 3 show the projected components of SRP's total energy generated (27,000 GWh) in FY13 and the installed capacity at system peak (7,501 MW).

**Figure 2**  
**FY 2013 Resource Energy Mix (GWh)**



**Figure 3**  
**FY 2013 Resource Capacity Mix (MW)**



## TRANSMISSION RESOURCES

SRP's extensive system of transmission, sub-transmission, and distribution facilities is a key element in providing electric service to SRP's customers. Transmission refers to the 500, 230, and 115 kV systems that are designed to carry electricity from remote SRP resources to the Phoenix metropolitan area. Sub-transmission refers to the 69 kV system that moves electricity to neighborhood substations. Distribution refers to the lower voltage 12 kV system that is used to deliver electricity locally. SRP owns, in whole or in part:

- 1,461 circuit miles of 500 kV lines
- 406 circuit miles of 230 kV lines
- 264 circuit miles of 115 kV lines
- 920 circuit miles of 69 kV lines
- 28,600 circuit miles of 12 kV lines

SRP also operates and maintains an extensive system of 73 transmission substations and 226 distribution substations that help effectively deliver electricity to SRP's customers.

The interconnected transmission system of the western United States allows SRP to purchase electricity from other utilities, and in a similar manner, allows SRP to sell electricity during those periods when energy from SRP resources is not needed by its retail customers. By selling to the wholesale market when SRP has surplus energy available, SRP generates revenue that helps keep customer rates low. These wholesale sales also help SRP to more efficiently utilize its generation assets. SRP actively participates in transmission projects and inter-utility working groups to help ensure that there will be adequate transmission capability to meet Phoenix metropolitan area requirements. Some of these projects may also provide access to new resource areas and increase access to existing power markets and open up new wholesale opportunities.

The interconnected transmission system also helps to sustain adequate system reliability. With connections to many other western state transmission and generating facilities, it is extremely unlikely that SRP customers will experience an extended electrical outage due to a shortage of generating resources.

As the Phoenix metro area expands and the population density increases, SRP will need to add transmission, substations, and distribution facilities to continue reliably serving its customers. Without these additions, the existing system may become overloaded, compromising the reliability and quality of service to SRP customers.

Each year, SRP updates a 10-year outlook that identifies future load growth patterns and determines when and where the existing transmission system becomes strained. The location of new electrical facilities is a community concern and a sensitive issue for existing businesses and homeowners. Therefore, whenever SRP studies indicate that new facilities are needed to serve an area, SRP initiates a public process to determine the facility location that maximizes the quality of electric service delivery to customers and minimizes physical impacts on the immediate area. The public process for transmission lines 115 kV and above is defined by the state, while SRP's Board of Directors defines the process for other facilities.

SRP and other Arizona utilities as well as interested and affected parties participate in WECC as well as several regional study forums, and local study forums to analyze system requirements, evaluate solutions, and determine courses of action to develop a system that provides reliable and economic service to a number of transmission owners involved in the study and their customers<sup>2</sup>.

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<sup>2</sup> More information on the forums and the studies in process can be found on [www.azpower.org](http://www.azpower.org).

## **ENVIRONMENTAL CONSIDERATIONS IN RESOURCE PLANNING**

SRP plans, constructs, and operates its power facilities in a manner that meets existing environmental requirements and is responsive to evolving public policy on environmental stewardship. SRP works closely with regulatory agencies and stakeholders in establishing environmental standards for SRP facilities that will be protective of public health and the environment.

### **Clean Air Act Compliance**

#### **Title IV – Acid Rain**

Title IV of the 1990 Clean Air Act Amendments (CAAA), known as the Acid Rain Program and implemented by the Environmental Protection Agency (EPA), set limits on sulfur dioxide (SO<sub>2</sub>) emissions from fossil fuel-fired power plants beginning January 1, 2000.

Emission allowances were allocated to each fossil fuel electric generating unit. The owner of the electric generating unit must hold allowances equal to the amount of SO<sub>2</sub> emissions. Rigorous monitoring and reporting requirements must be satisfied to comply with the Acid Rain Program. SRP has fully complied with all elements of Title IV.

SRP has full or partial ownership of six coal-fired power plants and four gas-fired power plants. All the operating coal-fired power plants have scrubbers to reduce SO<sub>2</sub> emissions. The SO<sub>2</sub> removal system at SRP's Coronado Generating Station (CGS) has recently been replaced to further improve SO<sub>2</sub> emissions control.

SRP holds sufficient acid rain allowances to cover actual and projected SO<sub>2</sub> emissions from its current portfolio of coal and gas-fired power plants.

SRP's coal-fired units also meet the nitrogen dioxide (NO<sub>x</sub>) emission rate limits set forth in Title IV for coal-fired boilers.

#### **Visibility**

States are required to periodically submit plans to EPA describing the measures they will take to address the federal Regional Haze requirements to protect visibility in National Parks and Wilderness Areas. Each plan covers a 10-year period. The current planning period covers 2008-2018 and Regional Haze plans submitted for this period are to include recommendations for certain stationary sources of pollutants, like power plants, to install emission controls for SO<sub>2</sub>, NO<sub>x</sub>, and particulate matter (PM<sub>10</sub>) to meet the Best Available Retrofit Technology (BART) provisions of the rule. BART controls have to be in place within five years of their approval by EPA.

SRP has an ownership share of several coal-fired power plants that are subject to the BART requirement. Additional investment in emission controls may be necessary to conform to the BART requirements. Specifically, the BART rules may require both Coronado Generating

Station (CGS) and Navajo Generating Station (NGS) to install advance combustion controls to reduce NOx emissions. SRP has already installed low NOx burners at NGS.

### **Hazardous Air Pollutants**

In December 2011, EPA finalized rules that establish emissions limits for mercury and other hazardous air pollutants (HAPs) emitted by coal and oil-fired power plants. These limits take effect in April 2015 and affect all of SRP's coal-fired generation units. The rules are likely to require NGS, CGS, and the Four Corners Power Plant to install additional control technologies to meet the mercury limit.

In addition to the federal requirements, Arizona finalized state regulations for controlling mercury emissions from coal-fired power plants. The regulations require that each existing plant, and all new plants, implement technology for removing 90% of the mercury in the coal by 2013. Arizona has delayed implementation of this requirement until 2016 under a consent decree signed with Arizona utility companies in exchange for voluntary early reductions of this pollutant. The consent decree affects SRP's CGS and Springerville Generating Station Unit 4. SRP has installed new controls at CGS to meet the voluntary reduction requirement; SRP is relying on existing controls to comply at Springerville Unit 4. It is expected that the Arizona mercury limit will be replaced by the federal limit before 2016.

Colorado, Nevada and New Mexico have also developed mercury control regulations that require minimum levels of control at each coal plant.

### **New Generation — Non-Attainment**

SRP's resource plan calls for building new gas-fired peaking generation within or near its customer load. A substantial portion of SRP's service area is located in a region classified as being in "non-attainment" with EPA's ambient air quality standards for PM10 and ozone. New peaking generation within the "non-attainment" area would have to be designed and constructed to meet the Lowest Achievable Emission Rate set forth by EPA. Furthermore, any significant increase of PM10, NOx, and volatile organic compounds (VOC) emissions would have to be offset by an equal amount. This is accomplished by reducing emissions at other facilities, upgrading mobile sources of emissions, or paving roads. New units would also have to meet New Source Performance Standards (NSPS) and conduct air quality modeling to demonstrate that emissions from the new unit(s) will not degrade air quality or impact visibility in nearby Class 1 areas.

### **New Generation — Attainment**

Any new generation located in areas classified as being in attainment with the national ambient air quality standards would have to meet Best Available Control Technology Standards, NSPS, and demonstrate that it would not degrade air quality or impact visibility in nearby Class 1 areas. Most new fossil fuel-fired units would also have to meet new source limits for HAPs and secure SO<sub>2</sub> allocations to cover SO<sub>2</sub> emissions.

## **Climate Change – Carbon Dioxide (CO<sub>2</sub>)**

EPA has moved to regulate greenhouse gases (GHGs) under several new or expanded Clean Air Act programs. In 2009, the agency passed the greenhouse gas mandatory reporting rule that requires large sources of GHG emissions to report their emissions to EPA. SRP submitted the first reports under this program in September 2011; subsequent reports are due annually to the agency. In addition to reporting requirements, EPA has added GHGs to the list of pollutants that are regulated under the existing New Source Review and NSPS programs. The New Source Review program changes have been finalized and affect new fossil fuel-fired units and existing units that undertake reconstruction or modification activities. To date, no SRP facilities have been affected by this rule. The NSPS program changes were recently proposed and would affect new fossil fuel-fired power plants. The new NSPS requirements, if finalized as proposed, would likely prevent near-term construction of any new coal-fired power plants as there are no control technologies currently available to help these plants meet the new GHG standard.

SRP continues to contribute to research in the areas of carbon capture and geologic sequestration technologies as these technologies are the most promising for meeting the new NSPS requirements.

SRP's renewable energy strategy calls for expanding investment in energy conservation as well as wind, biomass, geothermal, solar, and hydroelectric generation.

## **Water Supply and Water Quality**

Steam electric generating units require water for cooling purposes. SRP makes every effort to use renewable water resources at its power plants, find beneficial uses of plant cooling water, or implement technology to recycle cooling water. Given the water supply constraints of the arid West, dry cooling or hybrid cooling is considered to minimize water requirements when evaluating new plants.

Federal and state water quality agencies continue to establish more stringent water quality standards for western rivers and ephemeral streams. These standards will require existing and new power plants to invest in more advanced treatment technology and deploy zero discharge wastewater management options.

## SUSTAINABLE PORTFOLIO INITIATIVE

Over the years SRP has implemented a number of measures designed to reduce the use of fossil fuels for power generation. In April 2004, SRP's Board of Directors adopted a set of general principles to guide the acquisition of sustainable resources that include renewable generation, demand response, and energy efficiency. In the spring of 2011, SRP's Board of Directors approved a management proposal that directs SRP's future use of renewable energy resources and energy conservation measures.

SRP has established a goal that by FY20, 20% of SRP's retail energy requirements will be met with sustainable resources. This target includes the percentage of retail energy requirements met with annual aggregate energy-efficiency savings, utility scale renewable generation, and that which is directly attributable to certain customers (such as rooftop solar and Community Solar). This target was set at 9% in FY12 and increases at a rate of approximately 1.375% per year until the final 20% is reached. SRP will proactively seek opportunities to exceed the yearly target. As an incentive for early or accelerated acquisition, the environmental attributes of such resources may either be applied to future years or sold to reduce customer costs.

SRP will target the following annual incremental energy-efficiency savings contingent upon economics and support from federal, state, and municipal governments:

- FY12 – FY14: 1.50% per year
- FY15 – FY17: 1.75% per year
- FY18 – FY20: 2.00% per year

SRP's Sustainable Energy Portfolio combines renewable energy resources with energy conservation programs to benefit the environment. SRP's program integrates sound science, customer values, and resource preservation strategies.

Being "sustainable" means not simply being environmentally friendly in the way SRP generates power, but it also means how SRP uses it as well. SRP is committed to developing programs that enable SRP customers to partner in renewable energy resources and conservation.

Since August 2004, SRP has committed \$120 million in rooftop solar incentives to 10,000 customers. SRP pays the incentive in exchange for the renewable energy credits generated by the solar electric system. SRP offers the solar incentives to encourage investment in solar energy while defraying the cost of purchasing and installing a solar system. SRP is committed to helping customers take advantage of renewable technologies through rooftop solar incentives.

SRP launched the Community Solar program in FY12. Community Solar allows K-12 public schools and residential customers the ability to purchase power from the Copper Crossing Solar Ranch in Pinal County. By participating in the program, schools and residential customers can benefit from and support solar energy without the costs associated with leasing or owning a rooftop system. Participants have access to a website that displays data reflecting the power production at the solar facility. SRP will also provide the participating schools lesson plans and training for teachers about how to use the data for real-world mathematical analysis.

SRP has increased its investment in energy efficiency and demand response programs. Through FY14, SRP has increased its planned investment in energy efficiency by over \$250 million. Examples include incentives for the construction of energy efficient homes and commercial buildings, retail partnerships to discount the cost of energy efficient CFLs, and appliance recycling program that pays customers for the pick-up and recycling of inefficient refrigerators/freezers and comprehensive commercial programs that provide incentives for standard and customized efforts to install efficient lighting and other energy savings equipment.

SRP's time-of-use pricing plan is one of the largest in the nation. With commercial and industrial loads included, SRP has nearly 50% of its retail load subject to a time-of-use price plan. SRP also recently renewed a contract for its PowerPartner™ commercial demand response program. This direct load control program serves as an additional resource to call upon to shift peak demand.

### **Grid Scale Energy Resources**

Renewable resources are clean or “green” energy sources that have a much lower environmental impact than conventional energy sources. Renewable resources are attractive because they are replenished naturally, which means they will never run out. SRP has entered into contracts for the output from utility-scale sustainable resources. Among them are a diversified resource mix of wind, geothermal, large hydro and low-impact hydro, landfill gas and solar. SRP's total current renewable capacity is 728 MW and includes the following resources:

- Biomass: 13 MW
- Geothermal: 50 MW
- Landfill Gas: 22 MW
- Low-impact Hydro: 5 MW
- Hydro: 404 MW
- Solar: 57 MW
- Wind: 177 MW

### **Solar Energy**

Arizona's “Valley of the Sun” is well situated for solar generation, enjoying more than 300 days of sunshine each year. The advancement of technology, federal solar tax incentives, and reduced equipment costs has resulted in strong solar generation growth over recent years. SRP is utilizing solar energy in a variety of ways while helping to advance research and development of solar energy technologies and applications.

SRP has a 20-year agreement with PSEG Solar Source to purchase all the solar energy generated by Queen Creek Solar. SRP receives 19 MW of solar energy from Queen Creek Solar, a photovoltaic plant that contains approximately 90,000 crystalline panels operating on a single axis tracking system that follows the sun. This project was constructed by Juwi Solar Inc., which will continue to provide operation and maintenance services. Queen Creek Solar generates enough energy to serve about 3,300 homes. The power generated from the project is able to offset approximately 21,000 metric tons of CO<sub>2</sub> emissions each year, equal to taking approximately 4,100 cars off the road. Queen Creek Solar, located in Pinal County, went into commercial operation in October 2012.

SRP has a 25-year agreement with Iberdrola Renewables to purchase all the output from Copper Crossing Solar Ranch. The facility is producing 20 MW of solar energy in Florence, Arizona. This facility produces approximately 54 million kWh of solar energy annually. That is enough energy to meet the needs of about 3,700 SRP customers' homes each year, equal to taking about 4,500 vehicles off the road. Copper Crossing went online in 2011.

SRP is dedicated to utilizing sustainable practices at its own facilities, which includes the use of solar energy to reduce its environmental footprint. From offsetting the power requirements at one facility to heating the water for another, these solar installations provide a significant reduction in SRP's overall energy use.

SRP uses solar technologies on its facilities and partnering facilities as part of its best practices models and to test feasibility for customer and shareholder use.

#### **SRP Facilities – 1,012 kW**

- Arizona Falls Solar – 2.5 kW
- Agua Fria Solar – 200 kW
- Coronado Generating Station Solar – 20 kW
- Desert Basin Generating Station Solar – 10 kW
- Kyrene Telecom Facility – 4 kW
- Pinal Customer Center – 200 kW
- Power Operations Building – 100 kW
- Rogers 1, 2, and 3 – 400 kW
- Tempe Service Center Warehouse – 75kW

#### **SRP Community Partnerships – 324 kW**

- Arcadia High School – 10 kW
- Phoenix Park and Ride – 100 kW
- Mesa Public Library – 25 kW
- USBR Covered Parking – 10 kW
- Pecos Community Center – 30 kW
- Scottsdale Senior Center – 30 kW
- Audubon – 30 kW
- ARCH - 13 kW
- TCH – 13 kW
- Desert Botanical Gardens – 10 kW
- Maryvale YMCA – 10 kW
- Mesa Community College – 10 kW
- Phoenix Zoo – 10 kW
- Sarah's Place – 13 kW
- Sunshine Acres – 10 kW

SRP, Arizona State University (ASU), and SunPower Corp. have partnered to build a 1-megawatt solar photovoltaic power plant at ASU's Polytechnic campus in Mesa, Arizona. The 1-megawatt

facility will be the first commercial deployment of SunPower® C7 Tracker technology, a solar photovoltaic tracking system that concentrates the sun's power seven times and is designed to achieve the lowest levelized cost of electricity (LCOE) for solar power plants. The plant is expected to produce an amount of energy equal to that needed to serve about 225 SRP customers' homes.

### **Solar Incentive Programs**

The goal of the Solar Incentive Programs is to encourage investment and interest in solar power to increase consumer demand for solar, which will spur further research into solar technologies, ultimately making them more affordable.

The program offers financial incentives to SRP customers who install photovoltaic systems or solar water heaters in their homes or businesses. The contribution made by SRP helps defray the cost of purchase and installation of these systems and encourages their use and further development. SRP has set aside funding for 12 MW of residential solar electric installations for customers for FY13. The incentive structure is as follows: \$0.50 per watt for the first 5 MW; \$0.40 per watt for the next 4 MW; and \$0.30 per watt for the last 3 MW. SRP residential customers who install a solar water heater may qualify for an incentive payment of \$0.40 per kilowatt-hour of the annual energy savings realized by the system. Over 41 MW of distributed solar has been added since program inception.

### **SRP Community Solar**

SRP Community Solar allows SRP residential customers and public schools the opportunity to purchase energy attributable to the SRP Copper Crossing Solar Ranch, a 20 MW solar electric plant in Pinal County. Instead of installing panels on their home or school, a customer can "adopt" solar. This program is designed for any customer who does not mind paying a little more to help accelerate the growth of solar energy in the southwest region and in state of Arizona. It is an easy, affordable way for customers to take steps to advance clean energy. For participating schools, they gain access to solar educational materials and a web portal that provides data on the plant's production to provide teachers with information about the benefits of solar energy. SRP has allocated 18 MW to schools and 2 MW to residential customers. As of October 2012 SRP has over 1000 customers participating in Community Solar as well as over 100 school facilities.

### **EarthWise Energy**

EarthWise Energy allows SRP customers to be active in securing renewable resources for the future. For as little as \$3 per month, participating customers can invest in the development of renewable energy applications, as 100% of EarthWise Energy funds are used to generate clean energy. EarthWise Energy is used to build solar projects for non-profit organizations in the Valley. It is a cost effective way to make a difference by supporting solar with nonprofits reaping the rewards. These projects allow the recipients to offset some of their energy use with clean, renewable energy and save money on their monthly electric bill while reducing CO<sub>2</sub> emissions. Currently, approximately 4,800 residential and 75 small business customers participate in the EarthWise Energy Program.

## **Wind**

SRP diversified its renewable energy portfolio in October 2009 by purchasing 100% of the output from the Dry Lake Wind Power Project, located near Heber, Arizona. The project is Arizona's first commercial-scale wind farm. Dry Lake Wind I has 30 wind towers and Dry Lake Wind II, which came online in 2011, has 31 wind towers. Underground cabling links the turbines to a nearby substation that transmits the power to the grid. Each turbine produces about 2.1 MW of clean, renewable energy. Overall, the project offsets approximately 340 million pounds of CO<sub>2</sub> per year. SRP receives 100% of 127 MW generated from the wind farm, or enough to power more than 20,000 homes in the Phoenix metropolitan area.

## **Landfill Gas**

SRP's 4 MW landfill gas facility is located on the Salt River Pima-Maricopa Indian Community. It was completed in 2001 and captures methane gas created by the Tri-Cities landfill. The gas fuels five internal combustion engines at the landfill's power generating facility. Methane occurs naturally as waste decomposes in a landfill and is a greenhouse gas. The combustion of landfill gas improves the environment and produces enough clean energy to power more than 2,000 homes each year.

SRP has a short-term purchase contract for landfill gas located on the River Birch Landfill facility in Louisiana. The term of the contract is for 5 years from May 2010 to June 2015. SRP also receives the renewable energy credits (RECs) associated with the landfill gas. For each MWh produced from the burning of GHGs, SRP earns one REC.

## **Low-impact Hydro Power**

The term "low-impact" refers to hydroelectric generation that produces clean power using a canal's natural drop in elevation. SRP has 5 MW of low-impact hydro power from three facilities: Crosscut, a 3 MW facility located in Tempe; South Consolidated, a 1 MW facility located in Mesa; and Arizona Falls, a 0.75 MW facility located in Phoenix on the Arizona Canal.

Arizona Falls is a historic site that incorporates part of a retired hydroelectric plant built in 1911. It is a transformation of a historic waterfall that was formed by a natural 20-foot drop along the Arizona Canal. The new Arizona Falls combines art, history, and technology to generate clean electricity from the canal's waterfall. Power is provided by water from the Arizona Canal running through an adjustable blade turbine driving a 750 kW induction generator. SRP has improved the aesthetic features of Arizona Falls with waterfalls, shade canopies, landscaping, stairs, and walking paths around the power plant in order to make this an inviting point of interest for Valley residents.

## **Large Hydro**

Hydroelectric generation is an important part of the history of SRP and a technology that remains core to SRP's power production portfolio. SRP built the first hydroelectric facility to deliver power to the Phoenix area.

The water captured by SRP's dams on the Salt and Verde river systems store tremendous potential energy released through hydroelectric generation stations built into five of SRP's seven dams: Theodore Roosevelt, Horse Mesa, Mormon Flat and Stewart Mountain dams on the Salt River system and C. C. Cragin Dam on the Verde system.

These generating facilities produce a combined 269 MW of power to serve customers in the Valley. Through contract power purchases, SRP also receives power from the Hoover Dam, Glen Canyon Dam, and the Parker-Davis Project. In sum, SRP's large hydro resources produce 369 MW of power to serve its customers in the Valley.

### **Fuel Cell Technology**

SRP joined with ASU to install a 250 kW high-temperature molten carbonate fuel cell power system at the ASU East campus in 2005. Since it began operations, the plant has generated more than 2.5 million kWh of electricity. There are only 35 fuel cell plants of this kind in the world, and its Arizona's first hydrogen fuel cell plant. Owned and operated by SRP, ASU students and professors monitor and evaluate this facility daily. ASU benefited from having access to non-proprietary system operations and performance data, while the power generated is sent to the SRP grid.

### **Geothermal**

Geothermal power plants produce electricity from naturally occurring geothermal steam. The steam forms when production wells tap into superheated water reservoirs thousands of feet beneath the Earth's surface. Instead of burning a fuel to heat water into steam, heat from the Earth is used to create the steam that powers the turbines. Unlike certain other forms of renewable energy, geothermal power plants produce energy continuously irrespective of the time of the day or weather conditions. Geothermal is considered renewable energy because no fuel is consumed and the energy is from a naturally occurring source.

In 2007, SRP executed an agreement to purchase 50 MW of geothermal energy from Hudson Ranch I. That project is complete and began producing energy in February 2012. SRP has signed a second agreement for the purchase of 50 MW of geothermal energy from another plant that will be built in Southern California. The proposed geothermal generating station will be owned and operated by Hudson Ranch Power II LLC and will be constructed in the Imperial Valley near the Salton Sea. Hudson Ranch II is expected to be operational in 2015 and will provide a solid foundation of baseload renewable resources.

### **Biomass**

Biomass power, also called biopower, is electricity produced from biomass fuels. Biomass technologies convert renewable biomass fuels into electricity using modern boilers, gasifiers, turbines, generators, and fuel cells. SRP has a contract in place to purchase 13 MW of biomass power from the Snowflake Power biomass plant in Heber, Arizona. The biomass power plant burns wood and paper waste as a fuel source. The wood and paper mixture, which comes from thinning forests as well as a nearby paper mill waste, is enough to power 6,800 homes.

## **DEMAND-SIDE-MANAGEMENT PROGRAMS**

For over a century, stewardship and conservation have been integral parts of SRP's heritage. Being environmentally responsible extends beyond the way SRP generates electricity to how SRP helps its customers understand and conserve energy. Sustainable energy efficiency programs provide benefits to SRP and its customers by deferring the need for future generating resources, reducing emissions, improving overall efficiency and reliability, and reducing costs. In the past few years, SRP has introduced more than 25 new energy efficiency programs. Since May 2008, SRP has paid \$38 million in energy efficiency incentives to 400,000 customers. Over the next five years, SRP plans to invest more than \$300 million in energy efficiency and demand-response programs. Together, SRP and its customers take an active role in the stewardship mission, as evidenced by the following programs:

### **Residential Programs**

SRP offers a variety of programs and rebates to help its residential customers save energy, save money, and increase the comfort of SRP customer homes. By partnering with customers to manage their usage, SRP can better manage the cost to supply electricity. SRP's energy-saving rebates, discounts and advice give customers more control over their energy use and monthly bills. Customers are provided with the peace of mind that comes with taking control of their costs and protecting the environment. Residential customers can learn about SRP's programs on the [savewithsrp.com](http://savewithsrp.com) website.

#### **M-Power**

M-Power is a voluntary pre-pay power program, allowing customers to more actively manage their electricity consumption. With more than 130,000 customers, M-Power is the largest program of its kind in North America. M-Power allows customers to see their real-time power usage (via a special in-home display unit), giving them the ability to make more informed decisions regarding their electricity consumption. In addition, the program provides hands-on energy education for the entire family. M-Power has achieved one of the highest levels of customer satisfaction. On average, M-Power customers used approximately 12% less energy on M-Power than they did on alternative price plans.

#### **Home Performance with ENERGY STAR®**

Customers can receive a comprehensive home energy assessment for a discounted price. A certified contractor will evaluate the home's air conditioner, air ducts, insulation, lighting, windows and identify potential energy savings measures. As part of this program, customers can also receive rebates for air sealing and insulation if the assessment identifies deficiencies in these areas.

### **Duct Test and Repair Rebate Program**

A participating certified contractor will conduct a detailed test and analysis of the home's duct systems. Participants receive a rebate that is applied toward duct testing and could receive rebates for qualified duct repairs.

### **Cool Cash A/C Rebate Program**

SRP offers customers a rebate for the purchase of new energy-efficient heat pumps and package units to replace existing units in their homes. Rebates are paid according to the efficiency levels of the newly installed units. In conjunction with the Cool Cash A/C Rebate Program, SRP rewards contractors for superior quality-cooling and heating-system installations with their SRP Quality Installation Program. As of FY12, SRP provides \$100 to licensed contractors who conduct an industry-standard unit-sizing calculation as well as verify that airflow and refrigerant charge are within the manufacturer's specifications. The measures ensure the new system operates at peak efficiency and help provide the customer with maximum comfort.

### **Shade Screen Discount Program**

SRP provides incentives for customers to add shade screens to windows on east-, west- and south-facing walls. SRP customers can receive a rebate based on the square footage of the screens on qualifying new or refurbished, installed shade screens.

### **Pool Pump Program**

Customers can receive a rebate for replacing their single speed pool pumps with an energy-efficient variable-speed pump. A variable-speed pump allows pool owners to adjust their pump for peak efficiency and increased energy savings of 30% to 90%. The pumps are provided by participating pool supply and service companies and receive calibration to ensure that the pumps are operating properly from the time of initial installation.

### **Retail CFL Program**

This program provides customers with discounted prices for energy-efficient compact fluorescent lamps (CFLs) at several big box retail stores throughout SRP's service territory. SRP partners with retailers and lamp manufacturers to buy-down a portion of the bulbs' retail cost. CFLs use about 75% less energy and last 10 times longer than the standard incandescent bulb. CFLs produce 75% less heat and can cut customer energy costs associated with their home cooling.

### **Appliance Recycling Program**

SRP offers an incentive to customers for the removal and environmentally responsible disposal of older, yet still operating, refrigerators and freezers. This program targets second refrigerators and freezers in an attempt to remove inefficient units from service and

secondary resale markets. The program provides energy savings for customers and a significant environmental benefit, reducing up to 10 tons of CO<sub>2</sub> equivalent for each unit annually.

### **SRP ENERGY STAR® Homes**

SRP partners with Valley homebuilders to support their efforts to promote quality-built housing and increased energy efficiency of new home construction. The flexibility of this program benefits builders and buyers alike. SRP's program utilizes Energy Star's Version 3 to establish performance requirements and provides financial incentives to builders.

### **Shade Tree Program**

Customers can receive up to three desert-adapted shade trees for homes built before 1980 and up to two for all other homes. The trees come in 3 to 5-gallon containers and range in height from 4 to 6 feet. Participants must attend an SRP workshop to learn how to best select, plant, and care for the trees. By planting desert-adapted trees in energy-saving locations, you can reduce cooling costs, improve air quality, and lower the urban heat effect without having to use a lot of water.

### **HVAC Checkup Program**

SRP partners with the Electric League of Arizona and their certified contractors to promote a 16-point checkup on central cooling systems and heat pumps. This seasonal promotion typically runs from November through December and again from March through April in preparation for Arizona's cooling season. Properly functioning systems reduce energy usage and promote cost savings for the customer.

### **Energy-Efficiency Financing**

National Bank of Arizona is offering qualifying SRP residential (and small business) customers low, fixed-rate financing for energy-saving projects. This third-party financial institution has developed an offering to assist SRP's customers in overcoming the challenges of paying the upfront costs of larger energy efficiency projects.

### **Save With SRP Retail**

SRP is dedicated to educating its customers about energy efficiency at the point of purchase. SRP field representatives build and maintain relationships with retailers to increase awareness and participation in SRP programs. SRP conducts an average of six educational events at retail stores each month. These events integrate water, environmental, and energy-saving messages to help SRP customers increase efficiency.

## **Energy Analyzer Program**

With the Kill-a-Watt meter available through SRP's Energy Analyzer program, customers can determine how much energy is being used by household appliances and electronics. Based on this information, customers can take immediate action to reduce their household usage and lower their monthly energy bills. Customers can borrow a meter (at no cost) at local public libraries.

## **Home Energy Manager**

SRP offers free online tools to help customers evaluate their home energy use and learn about ways to save. Home Energy Manager will analyze how the customer's home uses energy and provide energy saving recommendations. There are additional savings calculators that can estimate potential savings for making those recommended changes. Included in the Home Energy Manager is a Kid's Korner that teaches children good energy-saving habits through a series of games, quizzes, and other online activities. The tools use the customer's actual bill data to make the personalized energy-saving recommendations.

## **Energy Scorecard**

SRP has recently launched a pilot program that provides select customers comparative energy consumption data comparing their usage to similar sized homes. These quarterly mailings/emails allow customers to be better informed of their usage and also provide tips on how to more wisely manage their energy throughout the year.

## **SRP Weatherization Assistance Program**

SRP provides funding each year to the Arizona Community Action Association to assist in administration of the U.S. Department of Energy's Weatherization Assistance Program. The federal program was designed to help low-income families and individuals decrease their home energy costs and focus on related health and safety issues in the home. Home performance improvements include various energy- and water-efficiency measures.

## **Commercial Programs**

SRP offers a wide range of energy-efficiency and demand response opportunities for business customers, including rebates for technical assistance and equipment installation. Commercial customers also have access to SRP's website *savewithsrpbiz.com*. Businesses can select their industry to get benchmarking data, advice, and rebates specific to their operations. The website also showcases customers who have benefited from participating in SRP Programs.

## **Standard Business Solutions**

The Standard program provides rebates for common energy-efficiency measures, including high efficiency lighting, HVAC, motors, variable frequency drives, compressed-air, and refrigeration equipment as well as select sensors and controls.

## **Custom Business Solutions**

The Custom Business Solutions program offers the flexibility to identify and implement energy-efficiency projects unique to a facility and its operations that are not covered by the Standard Business Solutions. These include energy-management control systems, process equipment improvement, and energy-efficient air distribution systems. Technical assessments are also available to qualifying customers to help identify energy-saving opportunities.

## **New Construction Solutions**

This program is designed to help business customers develop a whole-building, performance-based strategy from conceptual design phase through construction for buildings larger than 75,000 square feet and monthly demand greater than 400 kW. Design assistance is provided and rebates are available for customers who exceed the ASHRAE 90.1 2004 building energy code by a specific percentage. New Construction Solutions provides SRP consulting to facilitate ideas for incorporating energy-efficiency measures that will help customers realize future energy savings.

## **Retro-commissioning Solutions**

This program helps business customers optimize the performance of existing HVAC and control equipment. The process evaluates commercial and industrial facilities at least 2 years old with 75,000 square feet of conditioned space. Low- and no-cost measures are identified and implemented to improve operations and reduce energy consumption. Participants in the program have a payback period of two years or less, based on electricity savings from their investment. In many cases, the program also improves occupant comfort and production efficiency.

## **Small Business Solutions**

Small commercial and industrial customers can receive a no-cost walk-through audit of their lighting systems and discounts that can cover up to 75% of the costs for new energy-efficient lighting equipment. The estimated payback for a customer's investment in high-efficiency lighting equipment is typically less than one year.

## **Energy for Education Rider**

This program offers a unique, convenient financing option for financially challenged school districts that seek to make energy-efficient upgrades to their facilities but lack the upfront

capital. Participating schools repay SRP using the energy savings generated from the installed equipment.

### **SPATIA Energy Information Services**

A near real-time Internet-based tool allowing customers who know and monitor their energy usage patterns to cut costs by shifting peak loads, manage consumption, and optimize performance. SRP's customers subscribe for SPATIA EIS at over 700 metering points.

### **Signature Series**

A series of technical seminars and workshops for business customers on effective and efficient usage of electricity is offered in partnership with the Department of Energy (DOE) and other industry experts. Over the years, hundreds of customers have attended sessions on lighting, chiller optimization, and system assessments for motors, pumps, and other energy efficiency technologies.

## **Commercial Demand Response Programs**

### **PowerPartner™**

The SRP PowerPartner™ demand-response program provides SRP with the option to call voluntary usage curtailment events as financial signals or operational constraints dictate the need to reduce the demand for electricity. During the winter months, this resource is available to provide additional reliability for SRP's system during times of plant maintenance. The program is available to eligible high-use business customers and by the beginning of FY13 will provide as much as 50 MW of capacity.

## **FY13 RESOURCE PLAN**

Resource planning is an ongoing process in which SRP analyzes and evaluates a wide variety of resource options, taking into account a number of considerations. The resulting plan needs to strike a balance among diverse stakeholder interests while ensuring a reasonably priced, reliable supply of electricity to SRP customers. SRP's plan was developed by assessing and balancing several key considerations, including:

- Customer/stakeholder input
- Customer and operational needs
- Cost and value (minimizing costs and maximizing value)
- Location/transmission
- Conservation and stewardship
- Emissions reductions
- Fuel diversity and supply
- Water

SRP expects that many regional factors will continue to influence which resource options are most attractive including how much new generation is built, the adequacy of transmission, the adequacy of gas supply and transportation, evolving market structures, technological advancements, and uncertain regulatory and political outcomes.

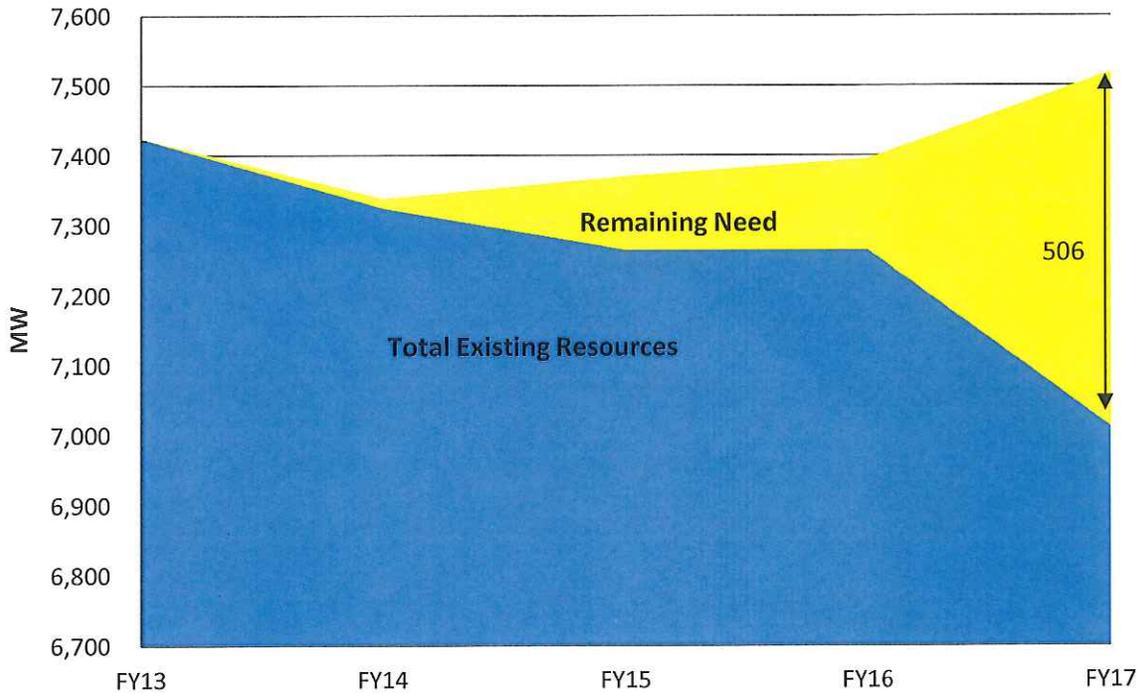
### **SRP Resource Needs and Existing Resources**

A primary component of SRP's expected resource need is the baseline forecast of the capacity and energy requirements of SRP's current retail electricity customers, plus those that are expected to migrate into SRP's electric service territory. In addition to retail demand, SRP's resource need also recognizes the impact of SRP's demand-side-management programs, the firm pumping load sale to the City of Gilbert, tribal resources, other firm sales, and a 12% planning reserve margin.

Even with slowed growth in customers and usage, and despite conservation efforts, SRP must plan for steadily increasing demand for electricity in the future. SRP plans to meet these retail load growth projections with conventional generation, renewable resources, energy efficiency programs, demand response programs, and time-of-use pricing programs.

SRP's highest demand occurs during a relatively short period of time each summer. This high summer season demand establishes the basis for reserve calculations and drives the need for new resource additions. Figure 4 shows SRP's projected capacity requirements, including planning reserves, compared to existing resources. The FY13 plan projects a 581 MW gap between capacity needs and existing resources by 2017.

**Figure 4  
Projected Resource Need**



Options for meeting the gap between projected resource need and existing resources are described in the following section.

**Future Resource Options**

Electric utilities generally employ three types of resources for meeting the fluctuating needs of customers: base, intermediate, and peaking. Base load generating facilities, such as Palo Verde or Navajo Generating Station, are operated as much of the time as possible. Peaking units (combustion turbines at Coolidge Generating Station, for example) are used for short periods of time to help meet the highest electric demands and to help handle the fluctuations associated with wind and solar generation. Intermediate resources, such as the combined cycle units at Santan, are deployed to fill the gaps. Base load generating facilities meet the bulk of SRP customers’ annual energy requirements.

SRP is committed to expanding its use of environmentally sensitive supply- and demand-side options, exploring additional ways to displace the use of fossil fuels, and providing opportunities for the introduction of new technologies and ideas. SRP will continue to evaluate and implement cost effective supply-side and demand-side measures that either offset or do not emit greenhouse gases or that reduce the use of fossil fuel generation. During the annual resource planning process, SRP seeks to achieve an appropriate balance between owned and purchased resources, and

conservation/energy-efficiency measures. To control customer costs, preference is given to least-cost options.

The following discussion outlines the resource options that SRP evaluates on an ongoing basis to meet its customers' resource needs.

### **Natural Gas**

Natural gas-fired generation is currently the economic and environmental choice for new electric generating capacity. Gas-fired resources can be constructed and placed into service relatively quickly, have predictable capital costs, can be sited near load pockets, and usually present fewer environmental challenges than other fossil fuels. Some of the challenges associated with gas-fired generation include fuel price volatility and infrastructure considerations such as pipeline capacity and storage facilities.

SRP continues to explore various gas-fired generation options including development at new sites, expansion and/or refurbishment of an existing SRP site, and merchant gas plant options. The FY13 Resource Plan includes a new natural gas-fired peaking resource in the latter portion of the ten-year plan.

### **Coal**

Favorable aspects of coal-fired generation include fuel diversity, fuel availability, and fuel price stability. Some of the challenges associated with coal-fired generation include remote siting, environmental issues, long lead times, and capital cost uncertainty for new plants. No additional coal plants are contemplated in SRP's current resource plan.

There have been advancements in technology with the modern coal-fired power plants. Such plants produce significantly less air pollutants than older coal plants because of increased efficiency. Coal plants are typically a lower cost fuel source with reliable base load power. In Arizona, coal-fired plants are responsible for many jobs within the state.

### **Sustainable Resources**

In the spring of 2011, SRP's Board set a Sustainable Portfolio Principles (SPP) target at 20% of SRP's Retail Energy Requirements to be sourced by sustainable resources by FY20. SRP's Sustainable Energy Portfolio combines renewable energy resources with energy conservation and demand response programs to reduce the impact of SRP's business operations on the environment and further increase the diversity of SRP's resource portfolio. As highlighted in the *Sustainable Portfolio Initiative* portion of this report SRP has already added several sustainable resources to its portfolio including energy efficiency, conservation programs, solar, landfill gas, low impact hydro, large hydro, fuel cells, wind, and geothermal.

The Sustainable Portfolio will increase resource diversity, reduce emissions, conserve water, and help SRP to respond to new regulations. SRP's approach to renewable resource acquisition is to maintain flexibility in order to respond to changes in technology and cost.

This approach helps to lower costs for SRP customers. SRP is committed to sustainable resources; since August 2004, SRP has committed \$120 million in rooftop solar incentives to 10,000 SRP customers, and since May 2008, SRP has paid \$38 million in energy efficiency incentives to 400,000 SRP customers. In FY12 alone, SRP committed \$98 million to renewable and energy efficiency programs. Furthermore, SRP's FY13 plan provides for an additional 273 MW of wind, geothermal, solar, and distributed generation resources by 2020.

### **Purchase Commitments**

Purchases provide flexibility and mitigate the risk related to the timing of the actual resource need. Through this highly flexible mechanism, capacity and energy can be purchased for years, months, weeks, days, and even just a few hours. SRP evaluates a variety of purchase commitment options in the resource planning process, including firm wholesale market purchases and unit contingent purchases that are tied to availability of a specific power generation resource. An important consideration in these evaluations is counterparty risk as the continued availability of the purchase under the negotiated terms is dependent upon the financial health of the supplier. Other considerations include the availability of necessary transmission capacity, market liquidity, and the characteristics of individual generating facilities. SRP continues to evaluate opportunities for additional purchases.

### **Demand-Side-Management Programs**

Demand-Side-Management programs are typically characterized by peak load reduction and energy conservation. SRP examines market opportunities based on customer technologies and estimates of the market potential for demand-side-management programs.

For residential customers, SRP encourages energy efficiency in the new home market through the SRP PowerWise Homes™ program. SRP PowerWise Homes™ adheres to strict energy efficiency standards that can save up to 30% on heating/cooling costs. SRP educates its customers on energy efficiency through SRP Home Performance with Energy Star, interactive educational web tools, and multiple rebate programs.

SRP also provides residential customer pricing options through time-of-use and M-Power pricing plans. SRP offers time-of-use price plans that offer discounted energy prices during off-peak hours and charge higher prices during specific on-peak hours Monday through Friday. There are two plans to choose from depending on which works best for the customers lifestyle. Although participating customers benefit directly from lower energy bills, all SRP customers ultimately benefit. Reducing the peak demand on SRP's system can lower fuel expenses, defer the building of new power plants, and reduce required reserves.

SRP's M-Power price plan is a prepayment plan that gives the customer control over their budget and cash flow. Using an SRP M-Power smart card, the customer can buy power any time in the amount the customer chooses. There are more than 110 SRP PayCenter machines in grocery stores, convenience stores and SRP offices throughout metropolitan Phoenix. The customer enjoys the convenience of no monthly bills or late charges. There is an equipment deposit and a small refurbishment fee for the in-home display unit.

For commercial and industrial customers, SRP promotes lighting, heating, ventilating, and air conditioning technologies for new commercial construction as well as retrofit projects and continues to provide pricing options through time-of-use price plans. Interruptible riders and demand response programs are currently included in the plan and will be considered as options in future plans.

Demand-side-management (DSM) programs implemented during FY12 were responsible for reducing energy consumption by about 940,880 MWH. As the economy improves, DSM programs help manage growth in energy usage by encouraging conservation and customer investments in energy-saving technologies. By partnering with its customers to manage their usage, SRP can better manage the cost to supply electricity. Through energy conservation and peak demand reductions SRP gives its customers more control over their energy usage and monthly bills. SRP will continue to pursue DSM programs as a means of reducing peak demand and energy conservation.

### **Nuclear**

Interest in nuclear generation is expected to increase in the future based on technological advances, its low variable cost, and lack of greenhouse gas emissions. Palo Verde is currently the only nuclear facility in SRP's generation portfolio and plays a significant role in providing low-cost, reliable base load generation. Challenges associated with building new nuclear generation include its high capital cost, long permitting time requirements, spent fuel storage issues, and an uncertain political and regulatory environment.

The FY13 Resource Plan does not include any new nuclear generation; however, SRP continues to monitor technological and other developments related to future nuclear generation options.

### **Hydroelectric**

SRP has several existing sources of hydroelectric generation (as described in the *Existing Electric Utility System Infrastructure* and *Sustainable Portfolio Initiatives* sections of this report). This technology remains core to SRP's resource portfolio. New large-scale hydroelectric facilities are unlikely in the planning horizon due to limited opportunities, high capital costs, and environmental impact concerns; however, SRP does consider opportunities to maximize value of current hydro assets. Before SRP brings a hydroelectric plant offline for maintenance, evaluations are done to determine the cost effectiveness of upgrading any of the power generation equipment. For example, Mormon Flat is scheduled to have a generator rewind and the facility will be upgraded with a new turbine to increase efficiency and ultimately generate more output. Another evaluation considers the economics of adding more pump storage capability to SRP's existing hydro system.

## **Existing System Improvements**

SRP's existing generation assets have been, and will continue to be, an integral part of the long-term resource plans. These generating stations historically have achieved high availability and low forced outage rates as compared to the industry average. SRP units are designed with more equipment redundancy to enhance reliability, such as having two boiler feed pumps rather than one, or spare transformers at the plants in case of emergencies. SRP's excellent reliability can also be attributed to prudent operational and maintenance practices. SRP continually evaluates technology options to improve reliability, operational efficiency, system flexibility, and environmental impacts.

SRP has implemented a number of improvements to existing facilities including major environmental controls at CGS and NGS that have significantly reduced NOx emissions. New systems are being added at CGS to further reduce NOx, mercury, and SO<sub>2</sub> emissions.

In 2010, SRP built a new backup transmission and generation control center. The Emergency Center is a fully redundant facility that adds a layer of reliability to SRP's power delivery system. SRP continues to examine prospects for cost effective improvements at its existing facilities.

## FY13 Resource Plan Summary

Table 1 shows existing generation resources, purchases, and planned resources.

**Table 1**  
**FY13 Resource Plan Summary<sup>3</sup>**

	FY13	FY14	FY15	FY16	FY17
	2012	2013	2014	2015	2016
<b>Resource Requirements</b>					
IRP Retail	6926	7036	7128	7246	7415
<b>Demand Side Resources</b>					
Existing Customer Distributed Renewables	-19	-23	-26	-30	-34
Demand Response & Retail Interruptible Programs	-179	-179	-179	-179	-179
HVAC & Lighting Codes & Standards	-36	-62	-92	-125	-159
M-Power Program	-59	-62	-66	-70	-69
Residential Programs	-165	-176	-185	-196	-213
<b>Total Demand Side Resources</b>	<b>-458</b>	<b>-502</b>	<b>-548</b>	<b>-600</b>	<b>-654</b>
Retail Peak	6468	6534	6580	6646	6761
Other Firm Loads and Sales	171	96	72	72	63
Reserves	809	823	839	854	885
<b>Total Supply Side Resource Requirement</b>	<b>7448</b>	<b>7453</b>	<b>7491</b>	<b>7572</b>	<b>7709</b>
<b>Existing Supply Side Resources</b>					
Conventional Generation	5725	5727	5720	5738	5586
Renewable Generation	274	274	276	276	276
Conventional Purchases	1119	1042	1041	1041	941
Renewable Purchases	257	232	178	160	160
<b>Total Existing Resources</b>	<b>7375</b>	<b>7275</b>	<b>7215</b>	<b>7215</b>	<b>6963</b>
<b>New Supply Side Resources (Committed and Planned)</b>					
Short-term Reserve Purchases	76	120	150	219	610
Hudson Ranch 1 Geothermal	50	50	50	50	50
Future Peaking/Intermediate Resources	0	0	0	0	0
Future Renewable Resources	0	14	106	106	106
<b>Total Supply Side Resource Additions</b>	<b>126</b>	<b>184</b>	<b>306</b>	<b>375</b>	<b>766</b>
<b>Total Supply Side Resources</b>	<b>7501</b>	<b>7459</b>	<b>7521</b>	<b>7590</b>	<b>7729</b>

<sup>3</sup> The information is consistent with the FY13-FY17 Resource Plan and represents a snapshot in time that balances many factors. Given the dynamic nature of the electric industry it is likely that some elements of this plan will change over time.

## **ACTION PLAN AND PERFORMANCE VALIDATION**

As shown on page 38, Table 1 summarizes the major elements of SRP's action plan. In addition to submitting an IRP every five years, WAPA's IRP regulations also require SRP to submit an annual IRP progress report that describes accomplishments achieved pursuant to SRP's action plan. SRP will continue to submit an annual IRP progress report – SRP's latest annual IRP progress report submittal was approved by WAPA in October 2012.

## **PUBLIC PARTICIPATION**

This draft edition of SRP's FY13 Resource Plan has been made available for public review and comment during the 30-day period beginning Wednesday, November 14, 2012 and ending Thursday, December 13, 2012. SRP has made copies of the draft report available by contacting the Secretary's Office at SRP.

A public notice of the opportunity to receive a copy of this document and submit questions and/or comments regarding the draft report was published in *The Arizona Republic* (Phoenix, Arizona), the *East Valley Tribune* (Mesa, Arizona), the *Tucson Citizen* (Tucson, Arizona), and *The Arizona Daily Star* (Tucson, Arizona) between November 9, 2012 and November 12, 2012.

## **PUBLIC NOTICE**

Public Notice is hereby given that the Salt River Project Agricultural Improvement and Power District (SRP) has prepared and is making available for public comment and review an Integrated Resource Plan for fiscal year 2013 for submittal to the Western Area Power Administration pursuant to Section 114 of the Energy Policy Act of 1992 (P.L. 102-486) and 10 CFR Part 905. This Integrated Resource Plan has been prepared and will be submitted on behalf of SRP, Town of Gilbert, Fort McDowell Yavapai Nation, and Salt River Pima-Maricopa Indian Community.

The Integrated Resource Plan is available for public review and copying weekdays beginning, Wednesday November 14, 2012, through Thursday, December 13, 2012, from 8:30 a.m. to 5:00 p.m., at SRP's Corporate Secretary's Office located in the SRP Project Administration Building, 1521 N. Project Drive, Tempe, Arizona 85281. Copies may also be obtained by calling SRP's Corporate Secretary's Office at (602) 236-5005 weekdays during business hours. Members of the public are invited to review and submit written comments on the Integrated Resource Plan addressed to: SRP's Corporate Secretary (PAB215) and mailed to: P.O. Box 52025, Phoenix, Arizona 85072-2025 or hand-delivered to: 1521 N. Project Drive, Tempe, Arizona 85281. The deadline for receipt of public comments is Thursday, December 13, 2012 at 5:00 p.m.

## COMMON TERMS

<u>Term/Acronym</u>	<u>Definition</u>
CO <sub>2</sub>	Carbon Dioxide
CRSP	Colorado River Storage Project
FERC	Federal Energy Regulatory Commission
FY	SRP Fiscal Year: May 1 - April 30 (For example, FY13 is May 1, 2012 through April 30, 2013.)
GWh	Gigawatt-Hours
IRP	Integrated Resource Planning
kV	Kilovolt
kW	Kilowatt
kWh	Kilowatt-Hours
LB/MMBTU	Pounds per million British thermal units
MW	Megawatt
MWh	Megawatt-Hours
NO <sub>x</sub>	Nitrogen Oxides
PM10	Particulate Matter
SO <sub>2</sub>	Sulfur Dioxide
SRP	Salt River Project
USBR	United States Bureau of Reclamation
Valley or Valley of the Sun	Greater Phoenix Metropolitan Area
VOC	Volatile Organic Compounds
WAPA	Western Area Power Administration
WECC	Western Electricity Coordinating Council
WSCC	Western Systems Coordinating Council