

Riverside Public Utilities

Economic and Social Impact Analysis



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Contents

Executive Summary	1
Introduction & Purpose of Study	4
Impact Methodology	5
Cumulative Impact of RPU on the Riverside (City) Economy	7
Economic Impact of Individual RPU Activities on the Riverside (City) Econ- omy	9
Additional Benefits of RPU to the City of Riverside	17
Conclusion	28
Impact Modeling Appendix	29

Executive Summary

The Inland Empire (IE) is the fastest growing region in the five-county Southern California area. With over 300,000 residents, the City of Riverside is the largest municipality in the IE and home to a substantial part of the region's economic activity. Moreover, much of the region's incremental growth in population and economic activity over the next several years expected to occur in the City of Riverside and nearby communities. Since 1895, the publicly owned and operated Riverside Public Utilities (RPU) has been an essential component of the infrastructure that serves the City.

The purpose of this study is to establish the economic contributions RPU makes to the City of Riverside economy. While this study evaluates RPU's fundamental contributions in terms of operations and capital expenditures, it also identifies and evaluates the impact of other activities and programs that benefit RPU customers, be they households or businesses. The study also assesses the net benefits of a publicly owned utility, as opposed to a private enterprise utility, serving the City of Riverside.

Beacon Economics drew data from RPU and a variety of outside sources to estimate the total impact that RPU had on the City of Riverside economy on an annual basis. RPU's expenditures, infrastructural investments, effects on employment and wages, savings to customers, as well as other indicators, are all examined in this report.

Economic Impacts

For fiscal year 2015-16, RPU had an economic impact on the City of Riverside of more than \$479 million. This includes \$289 million in direct impacts, more than \$107 million in indirect impacts, and more than \$83 million in induced impacts.

All of RPU's economic activity in fiscal year 2015-16 supported 2,081 jobs in the local economy. An additional 1,452 jobs were supported by the ripple effects of that direct spending, as it moved through the Riverside economy in the form of additional spending by local businesses or workers.

Table 1: Economic Impact Overview

Category	Output			Employment		
	Direct (\$ Millions)	Indirect/Induced (\$ Millions)	Total (\$ Millions)	Direct (Jobs)	Indirect/Induced (Jobs)	Total (Jobs)
Operations	128.8	94.8	223.5	725	717	1,442
Capital Improvements	55.2	34.2	89.4	333	258	591
Ancillary Activities	105.0	61.7	166.7	1,023	477	1,500
Total	289.0	190.7	479.7	2,081	1,452	3,533

Source: IMPLAN, Calculations by Beacon Economics

Figures have been rounded.

Impact of RPU's Operations

In fiscal year 2015-16, RPU's expenditures on operations totaled \$128.8 million. These expenditures include expenditures on local wages, transfers to the City of Riverside's General Fund, and other operational expenditures (such as the purchase of materials and services from other vendors). Altogether, RPU's operations supported \$223.5 million in economic output, 1,442 jobs, and \$70.8 million in labor income in the City of Riverside during the 2015-16 fiscal year through its linkages to the rest of the IE economy.

Impact of RPU's Capital Expenditures

From fiscal year 2005-06 to fiscal year 2014-15, RPU funded on average over \$55 million in capital improvement projects per year. Over the course of the year, these projects support 591 jobs, \$27.7 million in wages, and generate more than \$89.4 million in economic output for the City of Riverside.

Ancillary Impacts Associated with RPU

Consumer Cost Savings

RPU's low electricity rates compared to Southern California Edison (SCE) and low water production costs saved its customers over \$86 million during the 2015-16 fiscal year. Estimated expenditures out of these savings went on to generate over \$51 million in secondary impacts as it moved through the economy of Riverside.

Rebates

RPU also generates a significant economic impact each year by providing energy and water efficiency rebates to its customers. In the 2014-15 fiscal year (the most recent year of available data), RPU spent close to \$12 million on these rebates, which generated \$18 million in economic output.

Reliability

In 2014, RPU had an average power outage duration per customer per year (SAIDI) score of about 38 minutes during the fiscal year 2014-15, which was less than half the average score for the Inland Empire. That same year, RPU had an average outage per customer per year (SAIFI) score of 0.66, significantly lower than the 0.86 that Southern California Edison scored over the same time period. Through direct, indirect, and induced spending this increased reliability went on to generate over \$11 million in economic activity in the City of Riverside.

Additional Benefits to RPU Customers and the City of Riverside

Reliability and Self-Reliance

RPU is recognized for the reliability of its electric service with relatively low average power outage durations. Over the last decade, RPU has built four peaking power plants – with a peak electric generation capability of 192 MW - within city limits to ensure reliable electric service can be maintained in the face of continued electric load growth.

Moreover, RPU has been independent of imported water supplies since 2008. This was achieved in part by building a cutting-edge water treatment plant that treats up to 10 million gallons of water each day. In the face of drought conditions in Southern California, this water independence has and will continue to prove crucial to water security in the community.

Bond Rating

Through sound fiscal management, RPU has maintained its water revenue bonds at the AAA level and its electric bonds at the AA- level, ensuring low costs of borrowing when building future critical infrastructure.

Rebates, Economic Development, and Other Benefits

RPU engages in other efforts that benefit its customers. Two noteworthy examples are:

- RPU's Sharing Households Assists Riverside Energy (SHARE) program, through which over 5,000 low-income customers received help to pay their electricity bills, totaling nearly \$900,000 in aid, during the 2014-15 fiscal year.
- RPU's Solar Photovoltaic Rebate program, under the California SB 1 Solar program, has saved local customers over \$17 million and produced over 11 megawatts of clean solar power each day. In total, Riverside has over 26 megawatts of clean solar installed in the City through its Solar Photovoltaic Rebate program and the Net Energy Metering program.

Harder to quantify but important nevertheless is RPU's capacity to contribute to the City's long-run economic development. With safe and reliable water and power, competitive rates, and sound fiscal management, RPU provides a dependable service to customers and businesses in the community. This dependability leads to less downtime on the part of Riverside's businesses, thus reducing costs associated with downtime.

Given the RPU's role in the economy as a public utility, an employer and a part of the City's municipal government, it is crucial to consider the advantages and drawbacks of different types of utility ownership, whether public or private. From low service rates to environmentally sustainable business practices, RPU has had a consistently positive impact on the city over the years, a fact that has been acknowledged in the form of awards and recognition that the RPU has received through the years. Finally, RPU provides a wide range of benefits to the Riverside community each year relative to a private utility, as is documented further in the report.

Introduction & Purpose of Study

Each community in Southern California has unique needs for its businesses and residents, and the City of Riverside is no exception. The city is at the center of one of the largest and fastest growing metropolitan areas in the state, and its businesses are a driving force of economic growth in California. Reliable, stable, and affordable infrastructure is essential. Since 1895, the publicly owned and operated Riverside Public Utilities (RPU) has been a fundamental component of the infrastructure that serves the City of Riverside.

RPU and its 548 payroll employees serve the City of Riverside by providing electricity to over 100,000 metered customers and water to over 64,000 customers throughout its service area. It mainly purchases power, but it is 100% independent from imported water sources.

The purpose of this study is to establish and quantify the economic impact of RPU on the local economy. This study classifies these impacts as follows:

- RPU's fundamental contributions through its operations and capital expenditures
- Ancillary economic impacts on the local economy due to:
 - RPU's low electric and water rates relative to other utilities, which confer savings to its customers;
 - RPU's rebate and incentive programs, which likewise result in savings to its customers; and
 - the reliability of RPU service, which translates into relatively more "up-time" and enables its customers to be more productive.
- The net benefits of a publicly owned utility, as opposed to a private enterprise utility, serving the City of Riverside.

Each of these will be described in detail in the sections below.

Impact Methodology

The economic impact of RPU on the City of Riverside is measured in terms of the gross economic output, jobs, worker wages, and tax revenues that are generated by expenditures by RPU, along with the secondary effects of those expenditures, as well as the cost savings consumers enjoy as a result of having a locally-owned utility. RPU's total local expenditures include outlays for operations, spending on capital improvements associated with construction and development, wages to local residents, transfers of money to the City's general fund, and energy and water efficiency rebates.

Revenues were not considered in our approach to avoid double counting the economic activity RPU generates in the City of Riverside. In addition, to identify the specific *local* impact of RPU, only the portions of RPU-related expenditures that occurred within the City were considered.¹

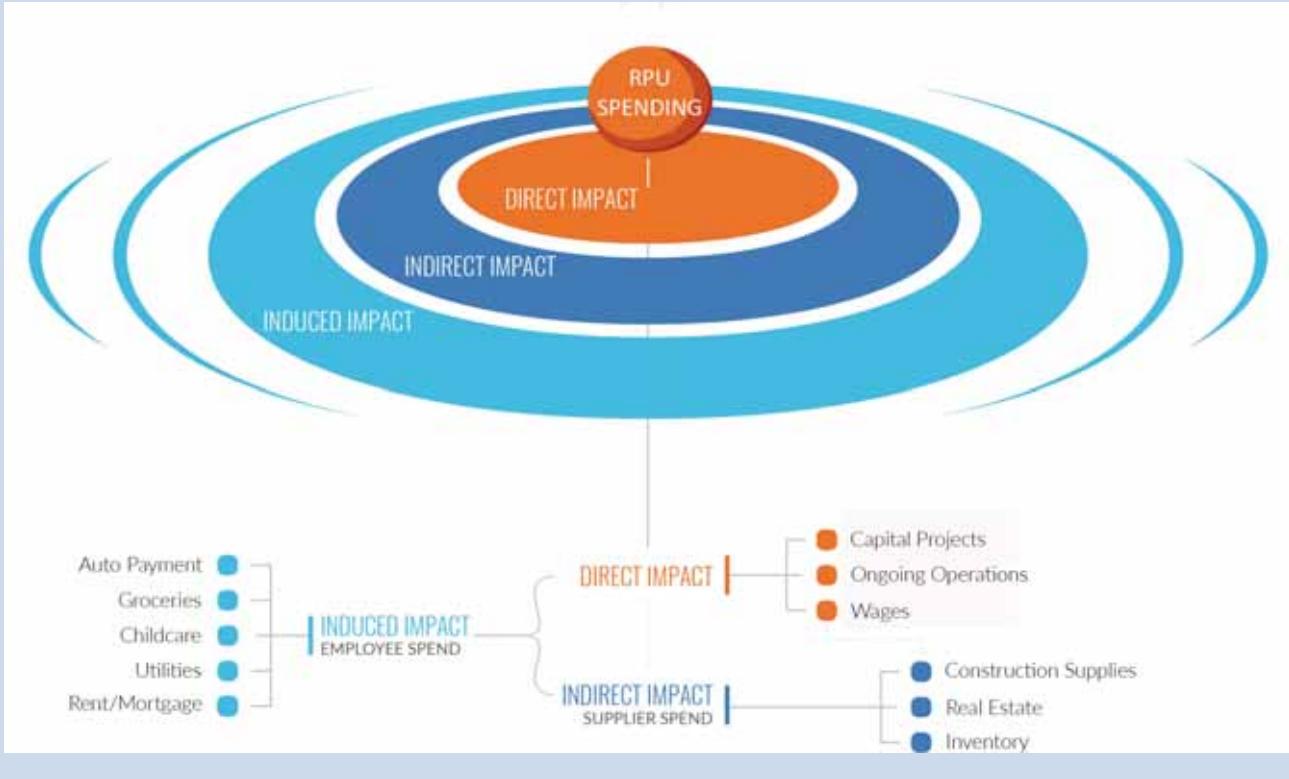
The impact of RPU's expenditures on the City of Riverside economy was estimated by using the IMPLAN modeling system. IMPLAN is an input-output model that estimates the economic impact or ripple effect of a given change in the local economy on other parts of the local economy.² IMPLAN produces estimates of direct, indirect, and induced effects of a given change in the economy, the sum of which is referred to as the total economic impact.

- The direct effect refers to the initial change (generally an expenditure) in the local economy, such as the construction of a new RPU facility. For example, when RPU purchases office supplies from a Riverside office supply store, RPU generates a **direct impact** on the Riverside economy.
- If, in turn, that Riverside office supply store purchases some of the goods sold in its store from other Riverside businesses, it would be generating an **indirect impact**.
- The employees working at the Riverside office supply store and the employees working at their suppliers in Riverside earn additional income through the direct and indirect expenditures, eventually spending some of these earnings in the local economy on goods and services, generating what is known as an **induced impact**.
- The sum of the direct, indirect, and induced impacts forms the total economic impact.

¹As detailed in the appendix, for expenditures that are not detailed at the City level, the IMPLAN input-output model is able to estimate the proportion of those expenditures purchased within City limits, as well as the expenditures sourced outside the City ("leakages"). This is based on applying the City's economic characteristics to determine purchasing patterns for every industry. For instance, in the case of capital improvements, IMPLAN estimates materials, labor, and services acquired within the City as opposed to those purchased elsewhere.

²A detailed description of the IMPLAN input-output model can be found the appendix.

Figure 1: Input-Output (Multiplier) Model Overview



RPU generates a positive economic impact on the City of Riverside primarily through two ways:

- The impacts of its operations
- The impacts of its capital improvements

These ongoing impacts (operations) and one-time impacts (capital improvements) are items traditionally examined in economic impact analyses. However, this study goes beyond the traditional impacts and also evaluates:

- Sustainability initiatives
- Rate savings to RPU customers
- The benefits of increased reliability
- Local controls and service
- Leveraging RPU for economic development efforts

Taken together, these benefits will be estimated using data to show the comprehensive economic impact of RPU on an annual basis.

Cumulative Impact of RPU on the Riverside (City) Economy

The amount of economic activity generated by RPU is significant. This economic activity does not only include the expenditures and cost savings that are generated directly by RPU, but it also includes the related expenditures that ripple through the economy due to this activity. These expenditures, as well as other measures of cost savings from RPU that generate an economic impact, include the following items:

- Operations
- Capital Improvements
- Consumer Cost Savings (Electricity)
- Consumer Cost Savings (Water)
- Reliability of Electric Power
- Electric and Water Efficiency Rebates

Further details concerning each of these economic impacts are presented below.

As shown in Table 2, in the 2015-16 fiscal year RPU was responsible for generating \$289.0 million in direct economic effects in the City of Riverside.

RPU operations involved \$24.2 million in expenditures on local wages, \$44.8 million in transfers to the City's general fund, and \$59.7 million in other operational expenditures (such as the purchase of materials and services from other vendors). As shown in Table 2, RPU's total operational expenditures in the 2015-16 fiscal year totaled \$128.8 million.

In any given year, RPU undertakes a variety of capital programs that maintain, update, or replace aging infrastructure, while also ensuring that the utility takes advantage of new developments in energy and water conservation. As shown in Table 1, using actual average annual expenditures on capital improvements from fiscal year 2005-06 to fiscal year 2014-15, the capital improvement projects undertaken by RPU directly add on average \$55.2 million in the City of Riverside's economy per year.

RPU also provides the City of Riverside ancillary benefits in addition to RPU's operations and capital improvements. These benefits include lower rates paid by local consumers, increased reliability, and energy and water efficiency rebates. As shown in Table 1, these ancillary benefits generated by RPU generated an estimated \$105.0 million in economic activity during the 2015-16 fiscal year in the City of Riverside.³

Table 2: Direct Economic Effect Summary

Category	Direct Effect (\$ Millions)
Operations	128.8
Capital Improvements	55.2
Ancillary Activities	105.0
Total	289.0

Source: IMPLAN, Calculations by Beacon Economics

³These figures are discussed in greater detail in the technical appendix of this report.

As shown in Table 3, the \$289.0 million in additional expenditures resulting from RPU's operations generated an estimated \$479.7 million in economic output in the City of Riverside. This includes the \$289.0 million in direct impacts attributed to RPU's operations and an additional \$190.7 million in secondary impacts, which include approximately \$107.6 million in indirect impacts and approximately \$83.1 million in induced impacts.

As shown in Table 3, the increase in economic output generated by these expenditures and cost savings increased the demand for labor in the City of Riverside by 3,533 jobs, including 2,081 jobs supported directly by all of RPU's spending in the local economy. These jobs are supported by RPU's workers spending money in the local economy, as well as by residents spending more in the City of Riverside due to the cost savings offered by RPU. In conjunction with those jobs, employees within the City of Riverside earned \$155.7 million in labor income, including \$96.0 million supported directly by all of RPU's economic activity.

Per \$1 million in direct expenditures, RPU generates an additional \$740,000 in total output, as a result of the utility's ripple effect on the local economy, for a total of \$1.7 million. In addition every \$1 million in direct expenditures gives rise to 12.2 jobs and \$500,000 in labor income, approximately a third of which (34%) goes to employees of RPU vendors (indirect effect) and local merchants whom RPU employees patronize (induced effect).

The economic output generated by the activities of RPU was also a boost to the City's finances. Based on estimates from the IMPLAN modeling system, the economic activity generated by RPU generated roughly \$8.6 million in taxes and other fees for the City of Riverside.

The cumulative economic impact of RPU is the sum of the individual impacts as described in the following section.

Table 3: Economic Impact Summary

Impact Type	Employment	Labor Income (\$ Millions)	Output (\$ Millions)
Direct Effect	2,081	96.0	289.0
Indirect Effect	790	33.5	107.6
Induced Effect	663	26.3	83.1
Total	3,533	155.7	479.7
Per \$1 Million	12	0.5	1.7

Source: IMPLAN, Calculations by Beacon Economics
Figures have been rounded.

Economic Impact of Individual RPU Activities on the Riverside (City) Economy

The cumulative economic impact of RPU is the sum of the individual impacts as described in the following section.

- RPU's fundamental contributions through its operations and capital expenditures
- Ancillary economic impacts on the local economy due to:
 - RPU's low electric and water rates relative to other utilities, which confer savings to its customers
 - RPU's rebate and incentive programs, which likewise result in savings to its customers
 - The reliability of RPU service, which translates into relatively more "up-time" and enables its customers to be more productive

Operations

Most of RPU's economic impact derives from expenditures relating to its operations. As a major local utility, RPU spends a substantial amount within the City of Riverside on its day-to-day operations each year. These expenditures include:

- Local wages paid to its workers
- Other expenditures including maintenance, production and operations, office supplies, and marketing
- The utility's transfer to the general fund

RPU's expenditures on one-time capital improvements are analyzed separately. Because RPU is locally owned utility, a significant amount of RPU's spending on its operations stay within the City of Riverside. **In all, RPU's operations expenditures in the 2015-16 fiscal year directly added \$128.8 million in the City of Riverside's economy.**

Local Wages

For this analysis, we focused only on the workers who live locally to better determine the proportion of wage/benefits that are captured locally and therefore provide an economic stimulus to the City of Riverside. Of RPU's 548-employee workforce, 255 employees live in the City of Riverside. **This worker breakout was further separated by occupation to accurately reflect how much of the wage/benefits paid accrue to front-line service workers versus administrative staff.** The breakdown for RPU's workforce by job type can be found in Table 4. In total, RPU paid approximately \$24.2 million in wage and benefits to employees who live in the City of Riverside.ⁱ

Table 4: Total Jobs by Division and Type

Division	Job Type	Share of Total Jobs (%)
Administration	Management Services	5.8
Administration	Business Support	1.2
Administration	Utility Billing	2.0
Administration	Field Services	7.8
Administration	Customer Service	9.9
Administration	Marketing Services	4.0
Administration	Legislative and Regulatory Risk	0.3
Electric	Production & Operations	8.0
Electric	Field Operators	12.7
Electric	Energy Delivery Engineering	5.8
Electric	Customer Engineering-GIS	4.4
Electric	Power Generation	9.1
Water	Production & Operations	5.5
Water	Field Operators	14.8
Water	Water Engineering	6.1
Water	Water Resources	0.8
Water	Conservation/Reclamation Program	0.4
Central Stores	N/A	1.2

Source: Riverside Public Utilities data

Other Operational Expenditures

Other operational expenditures by RPU include maintenance, production and operations, office supplies, and marketing. In all, RPU's other operational expenditures in the 2015-16 fiscal year directly added \$59.7 million in the City of Riverside's economy.ⁱⁱ

General Fund Transfer

RPU also provides funding to the City's general fund in the form of direct transfers. These funds can be used to finance its other municipal operations, because roughly **11.5% of the revenues generated by RPU will flow back into the City's budget rather than be held as retained earnings, distributed back to shareholders, or put to use in to use places outside the city, as would likely be the case in a privately-owned utility**. In total, the revenues generated by RPU in the 2015-16 fiscal year generated an estimated \$44.8 million for the City of Riverside's general fund.ⁱⁱⁱ

As shown in Table 5, the \$128.8 million spent on operations by RPU generated an estimated \$223.5 million in economic output in the City of Riverside. This includes the \$128.8 million in direct impacts attributed to RPU and an additional \$94.8 million in secondary impacts, which include approximately \$57.0 million in indirect impacts and approximately \$37.8 million in induced impacts.

Additionally, Table 5 shows that the increase in economic output generated by RPU increased the demand for labor in the City of Riverside by 1,442 jobs, including 725 jobs supported directly from the capital improvement projects undertaken by RPU. Furthermore, employees within the City of Riverside earned \$70.8 million in labor income from the uptick in economic activity.

The economic output generated by these operational expenditures also benefited the City's fiscal situation. Based on estimates from the IMPLAN modeling system, RPU's operational expenditures within the City generated roughly \$2.8 million in taxes and other fees for the City of Riverside.

Table 5: Economic Impact of RPU's Operational Expenditures

Impact Type	Employment	Labor Income (\$ Millions)	Output (\$ Millions)
Direct Effect	725	40.7	128.8
Indirect Effect	416	18.1	57.0
Induced Effect	301	11.9	37.8
Total	1,442	70.8	223.5
Per \$1 Million Spent	11	0.5	1.7

Source: IMPLAN, Calculations by Beacon Economics

Figures have been rounded.

Capital Expenditures

By having a locally owned and operated public utility, many of the capital improvements that are or will be made by RPU will occur in the City of Riverside, generating impacts associated with construction and development. In addition, these improvements can help to catalyze growth in other parts of the City that would not necessarily be possible without RPU's focus on serving exclusively the Riverside area.

By comparison, utility companies that serve several communities may choose to place facilities in locations independent of where their customer base is located. RPU can consider the economic development benefits of such investments for Riverside, such as unlocking commercial, industrial, or residential growth in the future as part of its decision-making process, which can facilitate growth in areas that may not receive it were it to rely on generating solely short-run profits/revenues for the utility.

In turn, these capital investments create ongoing economic activity in the region, generating jobs and boosting incomes for local residents. Using actual average annual expenditures on capital improvements from fiscal year 2005-06 to fiscal year 2014-15, **the capital improvement projects undertaken by RPU directly add on average \$55.2 million in the City of Riverside's economy per year.**^{iv}

As shown in Table 6, \$55.2 million in capital improvement projects undertaken by RPU generate an estimated \$89.4 million in economic output in the City of Riverside. This includes the \$55.2 million in direct impacts attributable to RPU and an additional \$34.2 million in secondary impacts, which include approximately \$19.4 million in indirect impacts and approximately \$14.8 million in induced impacts.

Additionally, Table 6 shows that the increase in economic output generated by RPU increased the demand for labor in the City of Riverside by 591 jobs, including 333 jobs supported directly from the capital improvement projects un-

dertaken by RPU. Furthermore, employees within the City of Riverside earned \$27.7 million in labor income from the uptick in economic activity.

The economic output generated by these capital improvements and economic development also generated roughly \$2.1 million in taxes and other fees for the City of Riverside, based on estimates from the IMPLAN modeling system.

Impacts of RPU Ancillary Activities and Programs

Certain RPU activities and programs have the effect of creating additional impacts on the City economy. These include low utility rates that result in savings to customers, rebate programs that reward customers with cost savings, high service reliability that limits downtime and associated costs. This section reports on the economic impact of these activities and programs. The details of the individual activities and programs are described in the following section.

Consumer Cost Savings (Electricity)

Using current publicly available rate schedules and average RPU customer class usage information from the 2015-16 fiscal year, we compared the rates paid by electricity customers of RPU with rates paid by residential, commercial, and industrial customers of SCE to determine the amount of savings that RPU customers benefit from as a result of being served by a locally-owned utility company. Because of these lower rates, consumers save money on their utility bills, some of which will flow back into the Riverside economy in the form of increased spending on various goods and services such as food, transportation, general retail, and dining.

As shown in Table 7, RPU electricity customers pay a lower rate per kilowatt hour than if served by SCE. The net effect of the corresponding savings to RPU customers supported an estimated \$37.5 million in additional expenditures in the City in the 2015-16 fiscal year.^v

Table 6: Economic Impact of RPU's Capital Improvements

Impact Type	Employment	Labor Income (\$ Millions)	Output (\$ Millions)
Direct Effect	333	16.8	55.2
Indirect Effect	140	6.2	19.4
Induced Effect	118	4.7	14.8
Total	591	27.7	89.4
Per \$1 Million	11	0.5	1.6

Source: IMPLAN, Calculations by Beacon Economics

Table 7: Electricity Rate Comparison

	Residential	Commercial and Industrial
SCE Rate (cents/kWh)	19.00	14.38
RPU Rate (cents/kWh)	15.70	13.43
kWh	725,815,000	1,420,878,000
Net Effect	\$23,951,895	\$13,498,341

Source: RPU and SCE Rate Schedules and average RPU customer class usage information from the 2015-16 fiscal year

As shown in Table 8, the \$37.5 million in additional expenditures resulting from the cost savings offered by RPU generated an estimated \$59.7 million in economic output in the City of Riverside. This includes the \$37.5 million in direct impacts attributed to the cost savings offered by RPU and an additional \$22.2 million in secondary impacts, which include approximately \$11.3 million in indirect impacts and approximately \$10.9 million in induced impacts.

In addition, Table 8 shows that the increase in economic output generated by these cost savings increased the demand for labor in the City of Riverside by 554 jobs, including 381 jobs supported directly by these cost savings offered by RPU. Furthermore, employees within the City of Riverside earned \$20.5 million in labor income from the uptick in economic activity.

The economic output generated by these cost-savings also improved the City's fiscal situation. Based on estimates from the IMPLAN modeling system, the cost-savings offered by RPU generated roughly \$1.4 million in taxes and other fees for the City of Riverside.

Consumer Cost Savings (Water)

By being water independent, RPU is also able to offer benefits to its customer relative to purchasing water from nearby water agencies. For example, RPU would have needed to spend \$54.0 million in the 2015-16 fiscal year to purchase water for its customers, compared to just the \$5.2 million RPU spent on local groundwater. Because of these lower costs consumers save money on their utility bills, some of which returns to the local economy in the form of increased spending on various goods and services. **Overall, we found that RPU water customers pay a lower rate than customers in other jurisdictions.** As a result, the net effect

Table 8: Economic Impact of RPU's Net Savings for Electricity Consumers

Impact Type	Employment	Labor Income (\$ Millions)	Output (\$ Millions)
Direct Effect	381	13.8	37.5
Indirect Effect	86	3.3	11.3
Induced Effect	87	3.5	10.9
Total	554	20.5	59.7
Per \$1 Million Spent	15	0.5	1.6

Source: IMPLAN, Calculations by Beacon Economics

Figures have been rounded.

Table 9: Economic Impact of RPU's Net Savings for Water Consumers

Impact Type	Employment	Labor Income (\$ Millions)	Output (\$ Millions)
Direct Effect	497	17.9	48.8
Indirect Effect	112	4.3	14.8
Induced Effect	114	4.5	14.3
Total	722	26.7	77.8
Per \$1 Million Spent	15	0.5	1.6

Source: IMPLAN, Calculations by Beacon Economics

Figures have been rounded.

of the savings generated by RPU supported an estimated \$48.8 million in additional expenditures in the City in the 2015-16 fiscal year.^{vi}

As shown in Table 9, the \$48.8 million in additional expenditures resulting from the cost savings offered by RPU generated an estimated \$77.8 million in economic output in the City of Riverside. This includes the \$48.8 million in direct impacts attributed to the cost savings offered by RPU and an additional \$29.0 million in secondary impacts, which include approximately \$14.8 million in indirect impacts and approximately \$14.3 million in induced impacts.

In addition, Table 9 shows that the increase in economic output generated by these cost savings increased the demand for labor in the City of Riverside by 722 jobs, including 497 jobs supported directly by these cost savings offered by RPU. Furthermore, employees within the City of Riverside earned \$26.7 million in labor income from the uptick in economic activity.

The economic output generated by these cost-savings also improved the City's fiscal situation. Based on estimates from the IMPLAN modeling system, the cost-savings offered by RPU generated roughly \$1.8 million in taxes and other fees for the City of Riverside.

Energy and Water Efficiency Rebates

By owning their own utility, ratepayers and city leaders can have greater control in ensuring that the provision of utility services is aligned with the needs and preferences of the local economy. For example, the City can be more aggressive in utilizing renewables as a source of power generation and transmission, if it so chooses. In addition, RPU can utilize more sustainable sources of water for its ratepayers, among other environmental and social strategies. These efforts not only help the city reach its social and environmental objectives, but they also benefit the economic prospects of the City. **In total, RPU spent \$11.6 million in order to support energy and water efficiency rebates in the 2014-15 fiscal year.**^{vii}

As shown in Table 10, the \$11.6 million on energy and water efficiency rebates from RPU generated an estimated \$18.0 million in economic output in the City of Riverside. This includes the \$11.6 million in direct expenditures by RPU on electric and water efficiency rebates, as well as \$6.4 million in secondary impacts, which include \$3.3 million in indirect impacts and approximately \$3.1 million in induced impacts.

Table 10: Economic Impact of RPU's Energy and Water Efficiency Rebates

Impact Type	Employment	Labor Income (\$ Millions)	Output (\$ Millions)
Direct Effect	87	3.9	11.6
Indirect Effect	21	1.0	3.3
Induced Effect	25	1.0	3.1
Total	134	5.9	18.0
Per \$1 Million	12	0.5	1.6

Source: IMPLAN, Calculations by Beacon Economics
Figures have been rounded.

Table 10 also shows the increase in economic activity generated by these energy and water efficiency rebates in turn increased the demand for labor in the City of Riverside by 133 jobs. Moreover, employees within the City of Riverside earned \$5.9 million in labor income from the uptick in economic activity.

The economic output generated by RPU's energy and water efficiency rebates also improved the City's fiscal position. Based on estimates from the IMPLAN modeling system, RPU's energy and water efficiency rebates generated roughly \$201,000 in taxes and other fees for the City of Riverside.

Reliability of Electric Power

The quality of RPU's service also generates a benefit to the City of Riverside through its high standards for service. These standards of service are maintained through detailed performance tracking metrics that, when analyzed, show how RPU exceeds other, comparable utilities in the region. In short, RPU customers enjoy fewer outages, quicker fixes, and an overall high caliber customer experience.

Overall, the number of outages and their duration for RPU customers were lower when compared to other local utilities.

Indeed, RPU's System Average Interruption Frequency Index (SAIFI) was 0.66, compared to Southern California Edison's 0.86, and RPU's System Average Interruption Duration Index (SAIDI) was 37.5, compared to Southern California Edison's 92.2.

As shown in Table 11, the impact of this increased reliability of electric power generated by RPU supported an estimated \$7.2 million in additional expenditures in the City in the 2015-16 fiscal year.^{viii}

As shown in Table 12, the \$7.2 million in additional expenditures resulting from the increased reliability of electric power offered by RPU generated an estimated \$11.2 million in economic

Table 11: Value of Increased Reliability of Electric Power

Customer Type	RPU Lost Activity	SCE Lost Activity	Diff. in Lost Activity
Residential	\$287,092	\$423,968	\$136,876
Commercial	\$3,733,330	\$6,052,737	\$2,319,407
Industrial	\$9,083,331	\$13,826,230	\$4,742,899
Total	\$13,103,753	\$20,302,935	\$7,199,183

Source: Lawrence Berkeley National Laboratory, "Updated Value of Service Reliability Estimates for Electric Utility Customers in the United States." January 2015. Figures have been rounded.

Table 12: Economic Impact of RPU's Increased Reliability of Electric Power

Impact Type	Employment	Labor Income (\$ Millions)	Output (\$ Millions)
Direct Effect	58	2.9	7.2
Indirect Effect	14	0.6	1.8
Induced Effect	18	0.7	2.2
Total	90	4.1	11.2
Per \$1 Million Spent	13	0.6	1.6

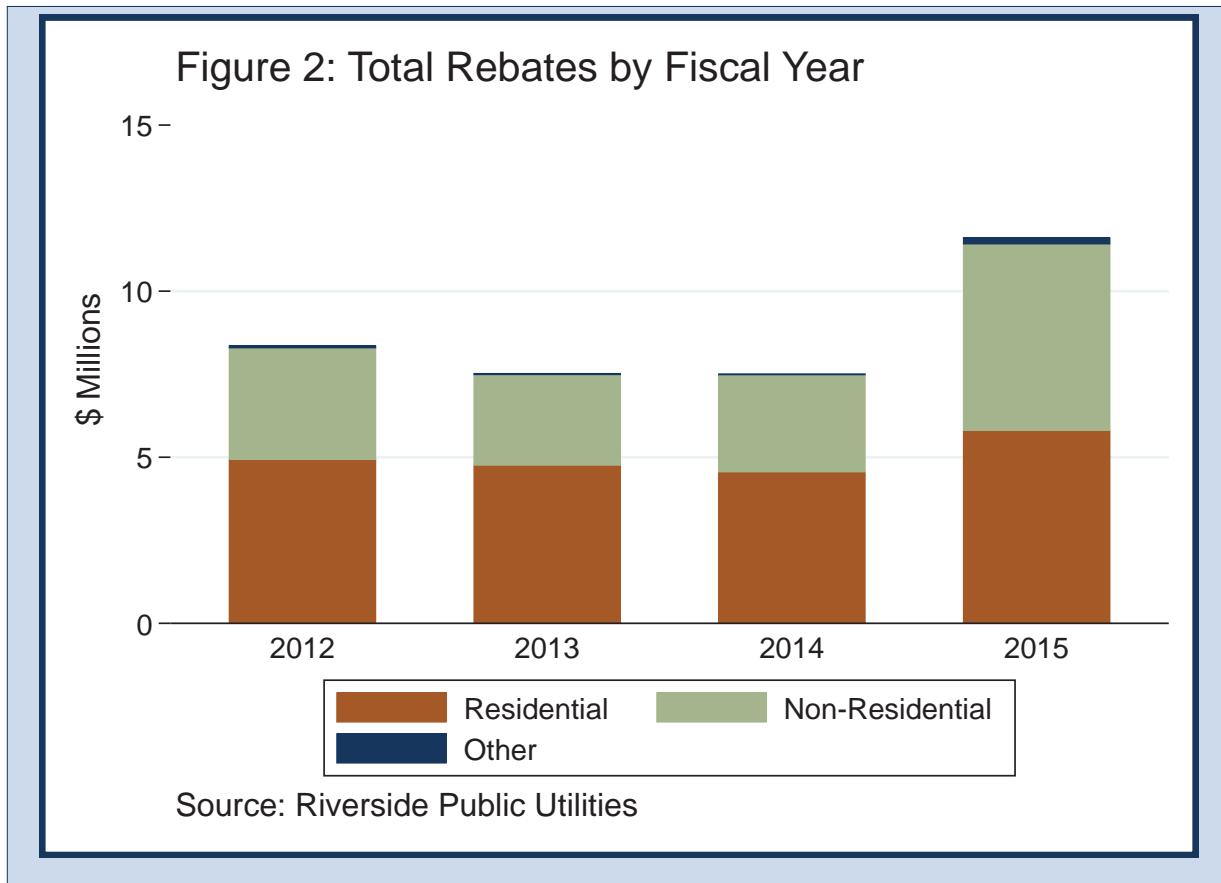
Source: IMPLAN, Calculations by Beacon Economics
Figures have been rounded.

output in the City of Riverside. This includes the \$7.2 million in direct impacts attributed to the increased reliability of electric power offered by RPU and an additional \$4.0 million in secondary impacts, which include approximately \$1.8 million in indirect impacts and approximately \$2.2 million in induced impacts.

In addition, Table 12 shows that the increase in economic output generated by the increased reliability of electric power increased the demand for labor in the City of Riverside by 90 jobs, including 58 jobs supported directly by the increased reliability offered by RPU. Furthermore, employees within the City of Riverside earned \$4.1 million in labor income from the uptick in economic activity.

Based on estimates from the IMPLAN modeling system, the increased reliability of electric power offered by RPU and the additional expenditures it created in turn generated roughly \$221,000 in taxes and other fees for the City of Riverside.

Additional Benefits of RPU to the City of Riverside



RPU offers many programs and services to help create a healthy business environment in the City of Riverside. Through local municipal ownership of RPU, ratepayers and city leaders have greater control in ensuring that the provision of utility services helps drive economic development efforts in the City of Riverside. The increased electricity demand from these efforts benefits all ratepayers. Moreover, RPU provides benefits to businesses such as incentive programs that provide rebates for technology purchases that can provide energy savings and promote energy efficiency and conservation. In fact, for over 15 years RPU has provided a number of benefit programs that can help make businesses more energy efficient.

The California water and electric industry is highly regulated, both by voter-approved amendments to the State Constitution and laws imposed by the State legislature. The California Constitution has two provisions that regulate electric and water rates:

1. For water, Proposition 218 was approved by voters in 1996 and added Articles XIIIC and XIIID to the State Constitution. In general, Prop. 218 provides that water rates may not exceed the cost to provide that service.
2. For electric, Proposition 26 was approved by voters in 2010, revising provisions of Articles XIIIA and XIIIC of the California Constitution. Similarly, Prop. 26 provides that electric rates may not exceed the cost to provide that service.

Along with these voter approved initiatives, the California legislature has adopted a number of laws which require electric and water utilities to reduce customer consumption of electricity and water and then report such customer savings, to invest in renewables and to provide customer energy efficiency rebates and programs.

To fund such programs for water customers, in 2004 and 2014, the City approved a Water Conservation Surcharge, which imposes a 1.5% surcharge on water charges. The revenue is used to fund measures to conserve RPU's ground-water supplies and avoid purchasing more costly imported water. To fund such programs for electric customers, beginning in 1999, the State has allowed electric utilities to impose a similar 2.85% surcharge on electric customer usage, referred to as "public benefit funds." RPU is also allowed to use other ratepayer funds to reduce water and electric consumption to meet state mandates for such reductions.

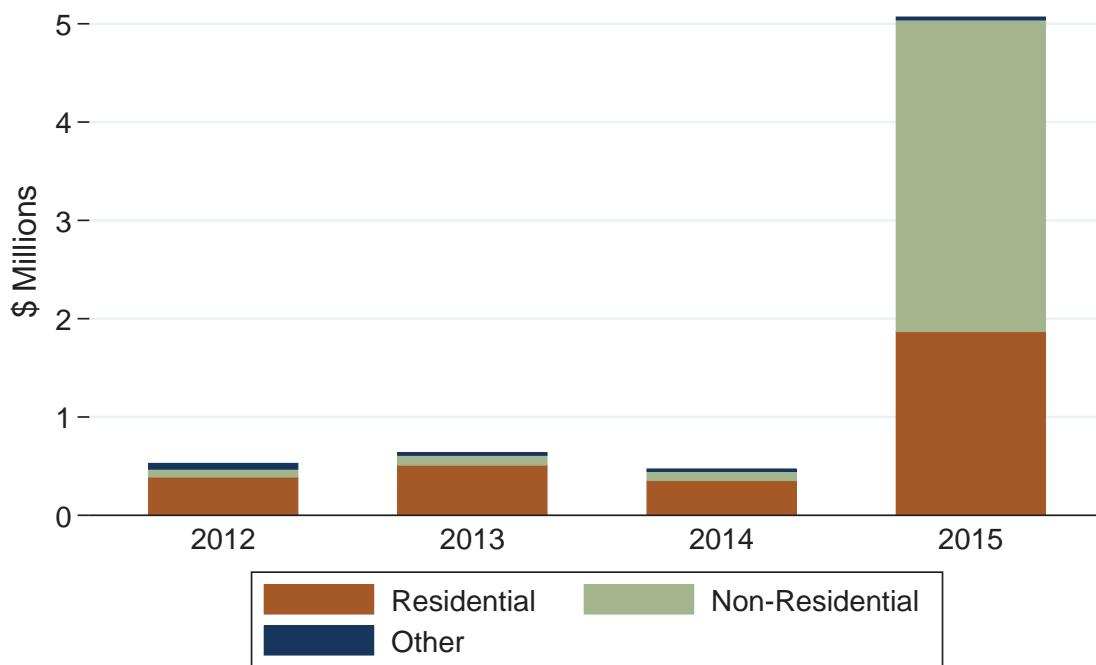
RPU has retained the local control and the discretion as to how to spend such funds, which has resulted in economic advantages to the City, as noted below.

Water Rebates

The California State Water Resources Control Board called on California cities to counter the worst drought in the state's history by conserving water. Following the call to conserve water, RPU's water customers reduced usage by nearly 4.4 billion gallons of water—enough to fill more than 6,000 Olympic sized swimming pools.^{ix} To encourage water conservation, RPU expanded its water rebates program tremendously during the 2014-15 fiscal year.

RPU's water rebates programs totaled \$471,000 during the 2013-14 fiscal year, but it expanded its efforts in 2014-15 by increasing its water rebates programs 976.2% to \$5.07 million.^x The largest programs during this time were the WaterWise Landscape (for both residential and non-residential users) programs, which offered rebates for water customers who replace existing lawn areas with water-efficient, California-friendly plants. During the 2013-14 fiscal year, non-residential users received just \$423 in WaterWise Landscape rebates—approximately 1,000 square feet of turf area removed. In fiscal year 2014-15, RPU received nearly \$3.6 million in funding from the Western Municipal Water District to combat the severe drought. With these outside funds included, RPU's water rebate program expenditures totaled \$5 million in that year alone. WaterWise Landscape rebate expenditures increased to over \$3 million, with over 30 program participants and approximately 1.1 million square feet of turf area removed.^{xi} By replacing existing turf grass areas with WaterWise Landscape or artificial turf, outdoor water use was cut significantly through RPU's water conservation programs that encouraged water wise practices through these rebates and incentives.

Figure 3: Water Rebates by Fiscal Year



Source: Riverside Public Utilities

Electrical Rebates

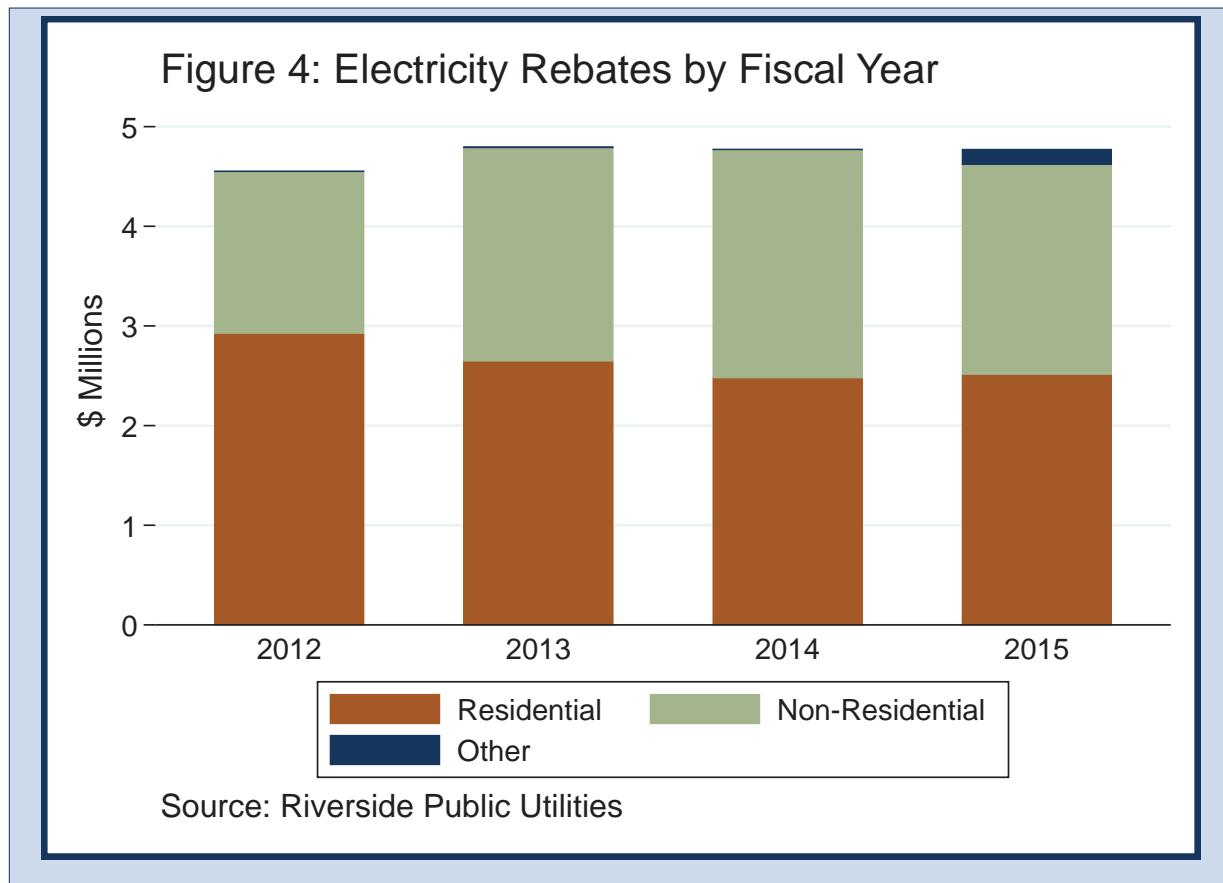
RPU's energy efficiency programs during the 2014-15 fiscal year helped customers reduce their energy usage by more than 19 million kilowatt hours.^{xii} Electrical rebate programs offered by RPU have held steady over the last four years, with an average of \$4.7 million expended across all programs each year.^{xiii} RPU also takes extra effort to ensure that lower-income customers are the beneficiaries of the energy efficiency programs offered.

During the 2014-15 fiscal year, more than 5,000 residential customers benefitted from the Sharing Households Assist Riverside's Energy (SHARE) program. This program helped qualified low-income earners in Riverside with their electric bills. Nearly one-fifth of all electrical rebates (\$900,000) were related to low-income assistance, demonstrating RPU's commitment to helping individuals at every rung of the economic ladder.

RPU is also committed to innovation. During that same year, RPU provided local businesses and universities with nearly \$70,000 in funding to conduct important research, development, and demonstration of energy efficiency, renewable energy, and energy storage projects.^{xiv}

Small businesses in the City of Riverside are also significant beneficiaries of RPU's electrical rebates. The Small Business Direct Installation Program is one of the largest energy efficiency programs offered to non-residential customers. Open to Flat and Demand Rate commercial customers, RPU offers direct installation programs that help small business customers lower their utility bills by installing energy and water efficiency upgrades at low or no cost. The utility also

helps businesses like mini-marts, delis and markets by installing efficient motors, replacement gaskets, and LED case lighting in large walk-in coolers through the Keep Your Cool Program. Together, RPU has expended over \$4.2 million for these two programs since fiscal year 2012.^{xv}

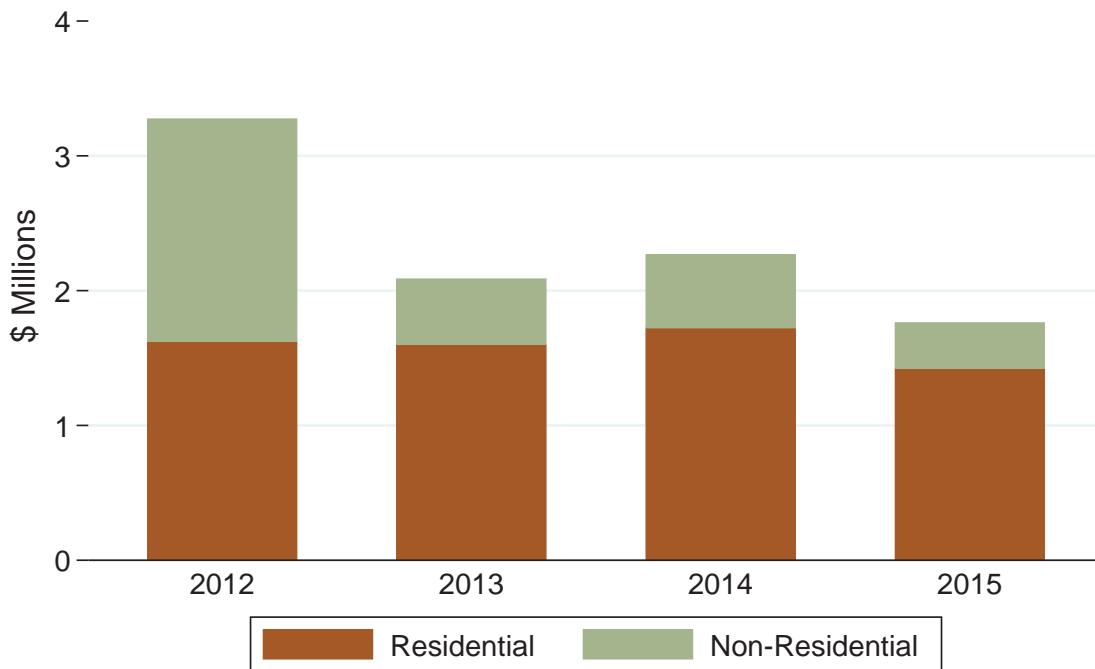


Solar Rebates

The City of Riverside has seen impressive support in its Solar Photovoltaic Rebate programs in both commercial and residential projects. These programs have assisted in the production of 11 megawatts of clean solar power out of the more than 26 megawatts produced every day within city limits.^{xvi} In fact, the City of Riverside has demonstrated its commitment to solar power with the first photovoltaic project beginning in 2002, having a capacity of 150 kilowatts.^{xvii}

RPU has implemented new procedures that expedite the approval process and make the process easier and faster for both businesses and residents to install privately owned solar PV systems and interconnect these systems to RPU's electric grid. Additionally, the non-residential and residential photovoltaic rebate programs provide financial incentives for customers to install qualifying photovoltaic systems on their facilities. In FY 14/15 residential customers were offered a rebate amount of \$0.50 per watt AC as long as the rebate does not exceed 50% of the total cost. For non-residential users, the rebate amount is \$0.50 per watt AC and cannot exceed \$50,000.^{xviii} From fiscal year 2011-12 to fiscal year 2014-15, RPU allocated nearly \$9.4 million in Public Benefit funds for both non-residential and residential solar rebate customers.^{xix}

Figure 5: Photovoltaic Rebates by Fiscal Year



Performance Metrics

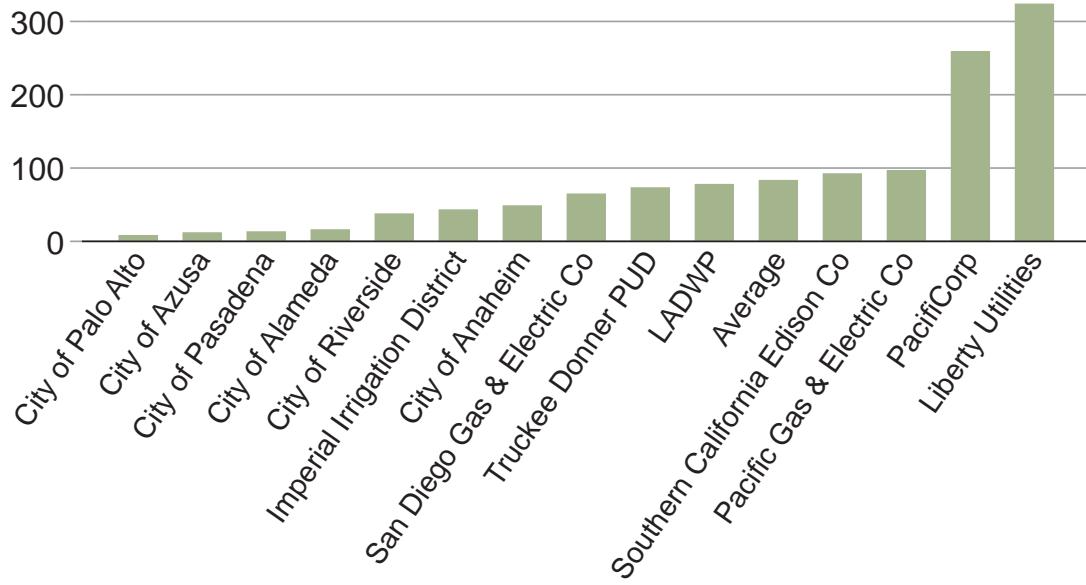
RPU prides itself on being energy efficient and customer-focused, operating under the guiding principles of safety, integrity, quality, and most of all reliability. In order to ensure these high standards of service, RPU maintains a rigorous set of performance metrics, routinely analyzing them for areas of improvement. These metrics include establishment of limits for the average duration and frequency of outages. A careful look at these measurements shows that RPU is among the top providers of water and electrical services to the region.

Electricity Reliability Metrics

Outage Duration

RPU limits the duration of outages per customer per year to 50 minutes or less. To demonstrate that RPU is meeting the goal, RPU uses the System Average Interruption Duration Index, or SAIDI. The SAIDI score measures average power outage duration for a utility. Maintaining a low SAIDI score has been a serious objective for RPU, and the data shows that it has succeeded in this endeavor. In 2014, RPU had an average SAIDI score of 37.5—less than half the Inland Empire’s average of about 137 over the last decade. When compared to other utility providers in the region, RPU was among the better performing utilities in California.^{xx}

Figure 6: System Average Interruption Duration Index
California Utilities, 2014

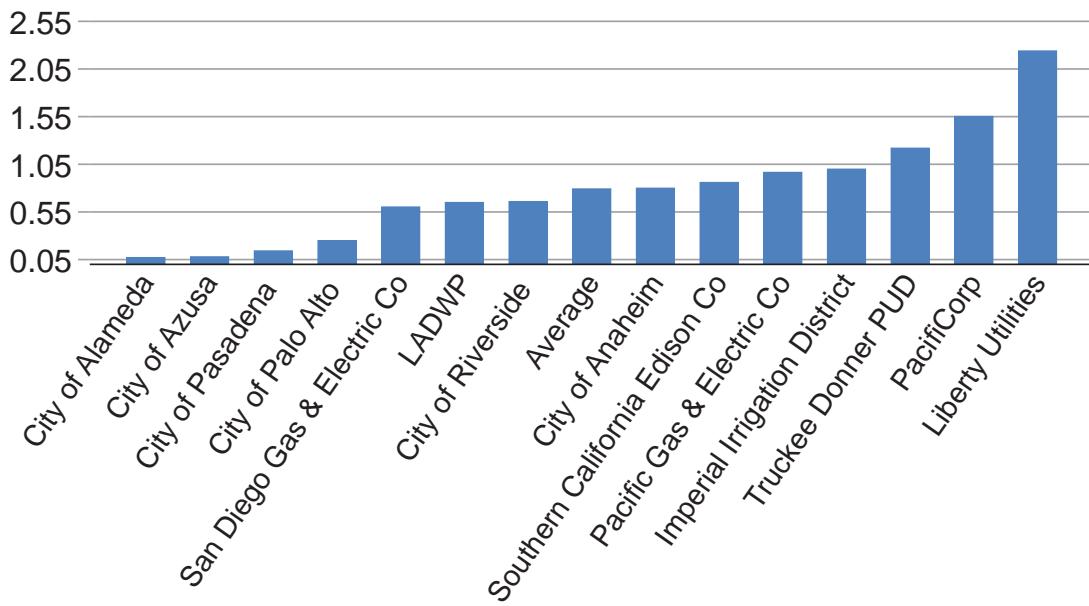


Source: U.S. Energy Information Administration

Outage Frequency

RPU limits the frequency of outages per customer per year to 1.15 outages or less. To demonstrate that RPU is meeting the goal, RPU uses the System Average Interruption Frequency Index (SAIFI). With SAIFI, utility providers are able to quantify how frequently power outages occur. Power outages can be extremely costly to customers—especially businesses. Even a relatively short outage can cost business hours of machine-rebooting time. Therefore, RPU works extensively to maintain a low SAIFI score. In 2014, RPU had a SAIFI score of 0.66—or about 0.66 power outages per customer, on average. This was substantially better than Southern California Edison (0.86) over the same time period.^{xxi}

Figure 7: System Average Interruption Frequency Index
California Utilities, 2014



Source: U.S. Energy Information Administration

Water Reliability Metrics

Water Quality

RPU takes extensive precautions to ensure that its water meets the highest standards of quality. Last year, over 22,000 samples were taken to help prevent hundreds of contaminants and bacteria from entering the water supply.^{xxii} These samples are collected at every point of the treatment and transportation process and tested by an outside testing laboratory, guaranteeing independent results. RPU consistently achieves contaminant levels well below state maximum regulations. Annual sampling data, including contaminant results, are publicly available online to establish total transparency.

Water Independence and Operational Efficiency

As noted above, since 2008, RPU has been independent of imported water supplies. This was achieved in part by building a cutting-edge water treatment plant that treats up to 10 million gallons of water each day.^{xxiii} In addition, several facilities were replaced or upgraded so that the water system could operate more efficiently. The savings from reduced operational costs were then reinvested in more efficiency upgrades, creating a virtuous improvement cycle.

Financial Reserves & Bond Ratings

Most recently, Standard & Poor's has affirmed RPU's water revenue bonds at the AAA level and its electric bonds at the AA- level.^{xxiv} This highest standard has been achieved by RPU for its consistently strong financial reserves—a sign of prudent management and constant transparency. High bond ratings allow RPU to issue bonds at lower interest rates, which in turn save the utility millions of dollars when borrowing money to pay for capital improvement projects, such as the replacement of old electric poles and ruptured water pipelines.

Having a secure financial position helps RPU provide its customers with markedly lower rates compared to other nearby communities. In a recent news release, RPU estimated the savings from these lower rates to be about \$90 million each year.^{xxv} Moreover, its financial reserves can be used for any emergency situations that might arise. For instance, strong reserves have enabled RPU to endure California's current five-year drought without resorting to vast rate increases on its customers.

Over the next decade, RPU plans to make investments in new infrastructure projects that could cost between \$500 million to \$1 billion in total.^{xxvi} These projects include:

- A recycled water system
- A rubber dam that will capture storm water and recharge the groundwater basin
- A new water treatment plant
- Building a new electric transmission line to the statewide power grid

With superb bond ratings and large reserves, RPU will be able to minimize the debt service obligations of the City, the utility, and in turn, its rate-paying customers.

Awards, Honors, and Social Involvement

Over the years, RPU has received many awards and honors for its excellence. Some of its most notable achievements include:

The E.F. Scattergood Award

Presented by the American Public Power Association (APP), RPU received this award in 2015 for its high achievements and performance as a public power utility. RPU's award-winning *Green Power Report* radio show and its designation as "Coolest California City" by the California Air Resources Control Board were among the many considerations factored into the APPA's decision.^{xxvii}

American City & County Magazine Crown Communities Award

This award was given to RPU in 2015 in recognition of its drought outreach and water conservation achievements. American City & County is a public service focused magazine that honors communities that are innovative in their public projects.

RP3 Award

In 2014, the American Public Power Association (APPA) designated RPU as a Diamond Level Reliable Public Power Provider (RP3).^{xxviii} This is APPA's highest award, and it is achieved by receiving a perfect score on four main criteria: reliability, safety, work force development, and system improvement. RPU was one of two Southern California utilities to be honored with this award in that year.

Orange County Engineering Council Engineering Project Achievement Award

In 2013, the Orange County Engineering Council presented RPU's Evan Reservoir Replacement Project with its Engineering Project Achievement Award. This award is given to public and private organizations with special projects that are in or around Orange County. Projects are considered for their complexity, scope, and unique engineering accomplishments.

Clair A. Hill Water Agency Award for Excellence Finalist

In 2010, RPU was a finalist for the Clair A. Hill Water Agency Award for Excellence.^{xxix} The global engineering firm CH2M Hill sponsors this award, and RPU was considered for its *Precision Nozzle Replacement Pilot Program*, which awarded free water-efficient nozzles to customers and saved 302 million gallons of water.

Association of Metropolitan Water Agencies (AMWA) Awards

RPU has received many awards from the AMWA over the years. These include the Gold Award for Exceptional Utility Performance (2009),^{xxx} the Platinum Award for Utility Excellence (2011),^{xxxi} and the Sustainable Water Utility Management Award (2015).^{xxxii} These awards consistently recognize RPU's strong local partnerships, innovativeness, efficiency, and commitment to sustainable practices.

RPU and Economic Development

Utilities levy connection fees so that existing utility customers are not burdened with subsidizing the costs of new infrastructure required to serve new customers. Many, if not most, utilities charge one-time connection fees. The naming convention of these fees varies widely, though the fees generally represent the same concept. For example, a water utility "tap fee" may be called any of the following: cut-on fee, installation fee, meter set fee, new meter installation fee, service fee, and turn-on fee. Although economic theory may suggest that fees constrain development, connection fees over and above the direct costs of a connection can presumably be used as a catalyst for growth, to the extent that they are used to pay for projects that enable growth in economic activity.

Connection fees offer a more efficient way to pay for infrastructure expansion by strengthening the linkage between those paying the fees and those receiving the benefits. Without connection fees, utilities would burden existing customers to fund system expansion to accommodate growth. By providing funding for infrastructure such as roads, waterlines, and sewer lines, connection fees can have a positive impact on encouraging residential and commercial development.

Capacity charges are another example of a connection fee. A capacity charge is a fee billed to property owners with new sanitary sewer connections made to a structure or addition to a structure. The charge serves many purposes, however, as it often translates into construction of pipes, pump stations, and treatment plants.

The purpose of the charge is to distribute the costs of expansion to the newest customers with the newest connections: growth paying for growth. By funding system expansion, connection fees reduce uncertainty and risk for developers and therefore encourage economic development. In addition, a public municipally owned utility is governed by the same city leadership (for example, City Council, City Manager, etc.) and is therefore, integrated into city's planning and development process. This in turn creates unique opportunities for collaboration on system expansion and improvements to promote economic development and reduce the mismanagement of infrastructure funds.

Though RPU provides some of the highest quality of service among utilities in Southern California, as demonstrated through the reliability metrics cited above, its quality of service does not translate into higher connection fees for builders and property buyers in the community. For example, the water development fees for residential lots in the RPU service area are up to roughly \$10,300. By comparison, water development fees for residential lots are roughly \$10,100 in the WMWD service area, \$21,100 in the EMWD service area, and \$16,400 in the Corona DWP service area.

Water development fees for commercial lots are also comparatively low for the area. Fees in the RPU service area are up to roughly \$30,400, compared to \$26,900 in the WMWD service area, \$48,100 in the EMWD service area, and \$52,000 in the Corona DWP service area.^{xxxiii}

Substantially high fees *could* discourage new residential or commercial construction in a community, particularly during times of economic downturn when construction activity tends to slow down, but RPU's connection fees remain relatively low for the region. Indeed, in Riverside, one of the hottest markets for new residential and commercial construction in California, these relatively low fees only help to encourage new construction activity even further.

Since January 2014, Governor Brown has issued six executive orders to help promote water conservation in the face of the ongoing drought. The most recent being Executive Order B-37-16 on May 9, 2016, that seeks to prioritize water usage, making conservation a "California Way of Life."^{xxxiv}

Does a private utility differ from a public utility in terms of conservations efforts? A 2010 study examined six water utilities in California found that public utilities "appear more proactive and target-oriented in asking their customers to conserve than their private counterparts."^{xxxv} A comparative analysis of 34 public and 31 private utilities found that public providers were more likely to appeal to their users to use less water because of the drought. Out of the 65 utilities in the sample, 16 said they had called for additional conservation, and 13 of those were public utilities.

Cost Comparisons: Public vs. Private Utilities

Because of the different methods involved in connection charges and the variation across regions, uncovering true cost comparisons between public and private utilities can be cumbersome, and in some cases, inconclusive. In other words, obtaining a true apples-to-apples comparison faces a number of pitfalls. Moreover, few studies have compared connection fees for public versus private utilities. California offers some comparisons, because of the mix of public and private utilities present, in some cases, next to one another. However, little to no literature exists because of the many different metrics (residential or commercial, for instance) and meter sizes involved.

Comparing rates and rate structures of private and public connection fees will only tell part of the story because of the many different methods of comparing pricing. What is more important is how the fees are used to expand existing and or future operations to shape future outcomes. Growth is not free.

Public ownership enables local governments to plan and implement strategic growth initiatives. In addition to investment, connection fees can be used to shape local objectives, usage patterns, and managing service costs. Leveraging connection fees internalizes costs and ensures that taxpayers are not on the hook for new development. Connection fees are necessary to service new developments that attract new real estate (both commercial and residential), which in turn promotes economic development in the short and long run. Without connection fees, local governments may have difficulty raising the necessary funds to pay for infrastructure, to the detriment of growth.

Conclusion

RPU generates an economic impact on the City of Riverside through its operations, its capital improvements, and additional activities and programs that benefit RPU's customers and the City. RPU generates an estimated \$480 million in economic output on an ongoing basis. Of this total, \$289 million results from direct impacts, which includes \$129 million in operations (including operational expenditures, local wages, and transfers to the City of Riverside General Fund). This also includes more than \$55 million in annual capital improvements on average, as well as roughly \$106 million in ancillary activities coming from rate savings, rebates, and reliability of supply.

As a result of RPU's ongoing economic activity, the demand for labor in Riverside increases by more than 3,539 jobs—over half of which are supported through direct economic activity by RPU. These jobs generate more than \$155 million in labor income, with over \$96 million of that directly credited to RPU.

Furthermore, locally based capital improvement projects, multiple rebates and green initiative spending, and minimal service disruptions all contribute to the savings and high quality of service that RPU customers enjoy. With exceptional fiscal management policies, RPU enjoys a strong reputation regarding its water bond ratings, which lowers the cost of financing important infrastructure investments.

Through its low prices and high quality and reliability of service, RPU stands as a major benefit to the City of Riverside. Riverside Public Utilities is good for the Riverside economy, the environment, and, most of all, the customer.

Impact Modeling Appendix

The IMPLAN Input-Output Model

The input-output modeling system used in this study is IMPLAN (Impact for Planning), originally developed by the USDA Forest Service and now operated by the Minnesota IMPLAN Group (MIG). In addition to updating and improving the databases and software, MIG holds regular training sessions, biannual user conferences and maintains a collection of hundreds of papers that have used IMPLAN.

One advantage of the IMPLAN system is the open access philosophy of the software design. IMPLAN is designed to provide users with maximum access so that they can alter the underlying structure of the data, the model, or means of assessing impact. The combination of the detailed database, flexibility in application, and the open access philosophy has made IMPLAN one of the most widely used and accepted economic impact modeling systems in the U.S. The results derived from IMPLAN analyses have been accepted in the U.S. court system and in many regulatory settings.

The IMPLAN modeling system combines the U.S. Bureau of Economic Analysis' Input-Output Benchmarks with other data to construct quantitative models of trade flow relationships between businesses, and between businesses and final consumers. From this data, we can examine the effects of a change in one or several economic activities to predict its effect on a specific state, regional, or local economy (impact analysis). The IMPLAN input-output accounts capture all monetary market transactions for consumption in a given time period. The IMPLAN input-output accounts are based on industry survey data collected periodically by the U.S. Bureau of Economic Analysis and follow a balanced account format recommended by the United Nations.

IMPLAN's Regional Economic Accounts and the Social Accounting Matrices were used to construct region-level multipliers that describe the response of the relevant regional economy to a change in demand or production as a result of the activities and expenditures related to Riverside Public Utilities. Each industry that produces goods or services generates demand for other goods and services and this demand is multiplied through a particular economy until it dissipates through "leakage" to economies outside the specified area. IMPLAN models discern and calculate leakage from local, regional, and state economic areas based on workforce configuration, the inputs required by specific types of businesses, and the availability of both inputs in the economic area.

The model accounts for substitution and displacement effects by deflating industry-specific multipliers to levels well below those recommended by the U.S. Bureau of Economic Analysis. In addition, when estimating the impact of household spending, multipliers are applied only to personal disposable income to obtain a more realistic estimate of the multiplier effects generated by increased demand. Importantly, IMPLAN's Regional Economic Accounts exclude imports to an economic area, so the calculation of economic impacts identifies only those impacts specific to the economic impact area, as determined by the purchasing patterns of the industries where changes in output are occurring. IMPLAN calculates this distinction by applying the area's economic characteristics described in terms of actual trade flows within the area. The current version of IMPLAN not only identifies what proportion of inputs are purchased locally, but also determines where inputs are sourced from that are not obtained within the local economic area ("leakages"). This enables a user to estimate the impact of a spending increase in one economy on other nearby economies and how increased economic activity in those areas in turn impact the original study area.

Impact studies operate under the basic assumption that any increase in spending has three effects: First, there is a direct effect on that industry itself, resulting from the additional output of goods or services. Second, there is a chain of indirect effects on all the industries whose outputs are used by the industry under observation. These are the impacts generated by a business' supply chain. Third, there are induced effects that arise when employment increases and household spending patterns are expanded. These impacts follow from the additional income that is earned in the course of producing this output, both by employees in the target industry and in those supplying it. In this analysis the IMPLAN model has been used to quantify all three of these effects.

Our analysis using input-output accounts is based on three important assumptions. First, there are constant returns to scale. This means that a 10% cut in spending will be ten times as severe-across every sector in the economy-as a one percent cut. Second, there are no supply constraints. This means that any marginal increase in output can be produced without having to worry about bottlenecks in labor markets, commodity markets, or necessary imports. This assumption is quite realistic in a free-market economy like California's where there is some unemployment. It is even more reasonable in times of high unemployment, such as the present economic environment, because there are many under- and un-utilized resources that can be activated without detracting from other industries or businesses. Third, the flow of commodities between industries is fixed. This means that it is not possible to substitute in the short-run the many different inputs that go into the target industry.

Finally, within the IMPLAN model, we define the term "job" as the annual average of monthly jobs in that industry. This is the same definition used by the Bureau of Labor Statistics and the Bureau of Economic Analysis. Thus, to illustrate, 1 job lasting 12 months is equal to 2 jobs lasting 6 months each, which are equal to 3 jobs lasting 4 months each, and so on. This definition should be kept in mind throughout the reading of this report.

Technical Appendix

ⁱSource: Received from Riverside Public Utilities.

RPU provided wages by job type along with the number of workers living in the City of Riverside. Total wages by job type were then adjusted to account for the share of workers who live in the City of Riverside. Workers who live and work in the City of Riverside form the basis of local wages for the analysis.

ⁱⁱSource: Riverside Public Utilities 2016 Financial Report available at: http://www.riversideca.gov/utilities/about-rpu/pdf/2016_Financial_Report_Separated_Print.pdf.

Data was collected from pages 14 and 71 of the 2016 Financial Report. Depreciation was excluded, as it's not creating economic activity to the city's economy. Purchased energy (water) was excluded as these expenditures go to areas outside the City of Riverside. Similarly, production and purchased power (electricity) and transmission (electricity) were excluded. The Public Benefit Programs were calculated separately and excluded from the calculation of other operational expenditures in this analysis. Similarly, transfers to the city's general fund were calculated separately and excluded from the calculation of other operational expenditures in this analysis. Other differences arise from the netting out of employee wages, which are described and calculated separately.

ⁱⁱⁱSource: Riverside Public Utilities 2016 Financial Report available at: http://www.riversideca.gov/utilities/about-rpu/pdf/2016_Financial_Report_Separated_Print.pdf.

Data was collected on actual transfers to the City's general fund from pages 14 and 71 of the 2016 Financial Report.

^{iv}Source: Riverside Public Utilities Finance 101 available at: <http://www.riversideca.gov/utilities/pdf/2015/Finance-101.pdf>.

This analysis used the 10-Year Average for CIP for the electric utility (\$31.8 million) and water utility (\$23.4 million) to estimate CIP for a typical fiscal year in the City of Riverside.

^vSource: RPU and SCE rate schedules available at: <http://www.riversideca.gov/utilities/residents/rates-electric.asp>
<http://www.riversideca.gov/utilities/businesses/rates-electric.asp>
<https://www.sce.com/wps/portal/home/business/rates/!ut/p/b1/>
<https://www.sce.com/wps/portal/home/residential/rates/!ut/p/b1/>

This analysis used the price per kWh for the average RPU residential, commercial, and industrial customers at current rates as a baseline, and then compared the price per kWh at SCE rates for the average RPU residential, commercial, and industrial customers. The difference between these two form the basis for the benefit offered by RPU to its customers.

^{vi}Source: Received from Riverside Public Utilities.

RPU provided data on the annual cost to purchase water from MWD. This analysis then used this annual cost as a baseline for the benefit RPU customers receive from RPU not having to purchase water from outside agencies.

^{vii}Source: Received from Riverside Public Utilities.

Data on electric, solar, and water rebates was received from RPU. This analysis then used these rebate figures as a baseline for the benefit RPU customers receive from electric, solar, and water rebates.

^{viii}Source: SAIFI and SAIDI Data from the U.S. Energy Information Administration (EIA) 2014 (latest available data year) and estimates for economic activity loss come from Lawrence Berkeley National Laboratory "Updated Value of Service Reliability Estimates for Electric Utility Customers in the United States," January 2015.

This analysis calculated the average frequency and duration of outages for both RPU and SCE customers. A study from Lawrence Berkeley National Laboratory was used to obtain estimates for economic activity losses for these outages. The analysis then compared the economic activity that would be lost for RPU customers based on SAIFI and SAIDI rates for both RPU and SCE. The difference in economic activity loss at each utility forms the basis for the economic benefit RPU provides its customers.

^{ix}Source: <http://www.riversidedrought.com/restrictions.html>.

^xSource: Received from Riverside Public Utilities. In the 2013-14 fiscal year, total rebates across all public benefits programs (including residential, non-residential, and other) totaled \$471,000. In the following fiscal year, total rebates totaled \$5.07 million.

^{xi}Source: Received from Riverside Public Utilities.

^{xii}Source: Riverside Public Utilities 2015 Public Benefits Annual Report available at: <http://www.riversideca.gov/utilities/pdf/cbr/2015%20Public%20Benefits%20Annual%20Report.pdf>.

^{xiii}Source: Received from Riverside Public Utilities.

^{xiv}Source: Riverside Public Utilities 2015 Public Benefits Annual Report available at: <http://www.riversideca.gov/utilities/pdf/cbr/2015%20Public%20Benefits%20Annual%20Report.pdf>.

^{xv}Source: Received from Riverside Public Utilities.

^{xvi}Source: Riverside Public Utilities 2015 Public Benefits Annual Report available at: <http://www.riversideca.gov/utilities/pdf/cbr/2015%20Public%20Benefits%20Annual%20Report.pdf>.

^{xvii}Source: Riverside Public Utilities 2013 Financial Report available at: <http://www.riversideca.gov/utilities/pdf/annual/2012-2013-RPU-Financial-Annual-Report.pdf>.

^{xviii}Source: Data available at DSIRE, aggregating data on incentives and policies supporting renewable energy: <http://programs.dsireusa.org/system/program/detail/135>.

^{xix}Source: Received from Riverside Public Utilities.

^{xx}Source: U.S. Energy Information Administration (EIA) data available at: <https://www.eia.gov/electricity/data/eia861>.

^{xxi}Source: U.S. Energy Information Administration (EIA) data available at: <https://www.eia.gov/electricity/data/eia861>.

^{xxii}Source: Riverside Public Utilities Water Quality Report 2015 available at: <http://www.riversideca.gov/utilities/pdf/wqar/2015-water-quality-annual-report.pdf>.

^{xxiii}Source: Information on facilities available at: <http://riversidepublicutilities.com/assets>.

^{xxiv}Source: Press release available at: http://www.riversideca.gov/press_releases/2016-0728-bonds-issued-by-city-of-riverside-and-riverside-public-utilities-earn-high-ratings.pdf.

^{xxv}Source: "City of Riverside Remains Committed to Strong Financial Reserves for Utilities." City of Riverside News Release. May 28, 2015. http://www.riversideca.gov/press_releases/2015-0528-city-of-riverside-remains-committed-to-strong-financial-reserves-for-utilities.pdf.

^{xxvi}Source: Information available at: <http://riversidepublicutilities.com/reserve/reserves-op-ed-final.pdf>.

^{xxvii}Source: "Riverside Public Utilities Receives National Award for Enhancing Prestige of Public Power From APPA." City of Riverside News Release. June 9, 2015. <http://riversidepublicutilities.com/news-display.asp?newsid=451>.

^{xxviii}Source: "Current RP3 Utilities." American Public Power Association. <http://www.publicpower.org/Programs/interiordetail2col.cfm?ItemNumber=41937>.

^{xxix}Source: "ACWA Honors East Bay Municipal Utility District with 2011 Clair A. Hill Award." Yahoo! News. May 12, 2011. <https://www.yahoo.com/news/ACWA-Honors-East-Bay-iw-3710419087.html>.

^{xxx}Source: "2009 Gold Award for Exceptional Utility Performance." Association of Metropolitan Water Agencies. <http://www.amwa.net/article/2009-gold-award-exceptional-utility-performance>.

^{xxxi}Source: "2011 Platinum Award for Utility Excellence." Association of Metropolitan Water Agencies. <http://www.amwa.net/article/2011-platinum-award-utility-excellence>.

^{xxii}Source: "2015 Sustainable Water Utility Management Award." Association of Metropolitan Water Agencies. <http://www.amwa.net/2015-sustainable-water-utility-management-award>.

^{xxxiii}Source: Received from Riverside Public Utilities.

^{xxxiv}Source: "Governor Brown Issues Order to Continue Water Savings as Drought Persists." State of California News Release. May 9, 2016. <https://www.gov.ca.gov/news.php?id=19408>.

^{xxxv}Source: "Public versus Private: Does It Matter for Water Conservation? Insights from California." *Environmental Management*. 2010.