



**ECONOMIC IMPACTS OF
PALO VERDE NUCLEAR GENERATING STATION
ON ARIZONA**

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1.0 Introduction

Purpose of the Study

Applied Economics was retained by Arizona Public Service Company to perform an economic analysis of the Palo Verde Nuclear Generating Station (Palo Verde). This analysis is intended to provide a framework for understanding the economic and revenue impacts that this nuclear generating facility creates in Arizona. Palo Verde, located about 55 miles west of Phoenix, has been the largest power producer of any kind in the United States since 1992. Its three units are capable of generating over 4,000 megawatts of electricity. The facility is operated by APS and is owned by a consortium of seven utilities in the Southwest. APS owns 29.1 percent of the plant. This analysis documents economic and revenue impacts of Palo Verde on Arizona. It covers a six year period from 2008 to 2013. Impacts are shown for Maricopa County and for the state as a whole.

Palo Verde is not only a major employer in the West Valley, but also makes a substantial amount of local supplier purchases that support the region's economy. Palo Verde directly employs over 2,400 people, plus 400 to 500 local contractors, with a combined annual payroll of \$255 million in 2009. Non-local contractors are employed at Palo Verde twice per year to support 30 to 60 refueling outages, spending substantial sums on temporary lodging and food. APS also makes over \$224 million per year in local vendor purchases on behalf of Palo Verde. Palo Verde is a significant contributor to the local economy through the jobs it creates directly, as well as the hundreds of other local companies they support through their vendor purchases and through spending by their employees. This analysis does not attempt to quantify additional environmental value of clean sustainable power produced by Palo Verde, or the economic development advantages of providing reasonably priced power to the Southwest region. However, these are important additional benefits that Palo Verde creates.

Applied Economics Background

Applied Economics is an economic consulting firm, based in Phoenix, Arizona, specializing in economic development, economic and fiscal impact assessment, socioeconomic modeling, urban planning and custom software applications. Applied Economics conducts economic and fiscal impact studies and develops models to measure the effects of a wide variety of activities. These activities include development land use and policy changes, business-driven economic impacts, incentives, and program-driven economic and fiscal impacts. The partners at Applied Economics have worked together for more than twenty years, and are very experienced in working with local and regional planning and development issues. Applied Economics was formed in 1995 and specializes in the technical aspects of economic research.

The information and observations contained in this report are based on our present knowledge of the components of development, and of the current physical, socioeconomic and fiscal conditions of the affected areas. Estimates made in this analysis are based on hypothetical assumptions, current tax policies, and the current economic structure of the region.¹

¹ This analysis is based on the best available information and is intended to aid APS in quantifying Palo Verde's impacts on the local economy. Even if the assumptions outlined in this report were to occur, there will usually be differences between the estimates and the actual results because events and circumstances frequently do not occur as expected. In no way will Applied Economics be held responsible or have any liability or be subject to damages as a result of this analysis. This report may be used only for the purposes that it was intended.

2.0 Impact Summary

The economic benefits resulting from Palo Verde include the direct activity created by the power plant itself, as well as the impacts create by local supplier purchases and by employee spending. Economic impacts measure the effects of economic stimuli, or expenditures, in the local economy. These impacts include direct and indirect jobs, personal income, and economic activity or output that is generated by the nuclear generating station. Indirect impacts are the result of the multiplier effect and capture supported supplier and consumer businesses and their employees in Maricopa County and Arizona that benefit from Palo Verde.

The operations of Palo Verde detailed in this analysis provide substantial economic benefits to Maricopa County and Arizona. These positive impacts include the following:

Economic Impacts

- **Overall Operations Impacts.** All total, Palo Verde created an annual economic impact of \$1.8 billion on the Arizona economy in 2009. The operations of Palo Verde directly and indirectly support an estimated 8,800 jobs and \$508.8 million in annual payroll in Arizona.² This is in addition to the revenue impacts created by Palo Verde.
- **Jobs and Income.** The facility directly employs about 2,900 employees and contractors with a combined payroll of \$255.1 million annually in 2009. Through the multiplier effect, an additional 5,800 jobs and \$253.7 million in payroll are supported annually at other businesses throughout the state. These additional jobs and payroll stem from direct and indirect impacts of supplier demand created by Palo Verde and consumer demand created by its employees.
- **Local Spending.** The nuclear generating facility made an estimated \$223.8 million in local purchases for various equipment, supplies and services in 2009, representing 31 percent of total vendor purchases in that year. Purchases vary from year to year and local purchases represented 35 percent of total vendor spending in 2008. Based on the share of vendor purchases that are made locally, the annual economic impact on the state is estimated at \$399.4 million in 2009. This impact is included in the overall operations impact above.
- **Employee Spending.** Another component of the overall operations impact comes from employee spending. The 2,900 current FTE employees and contractors working at Palo Verde also make a significant amount of local purchases. The effect of employee purchases from current employees and contractors generated a total economic impact of \$300.0 million on the state in 2009. A sizeable portion of the contractor spending occurs during two 30 to 60 day refueling outage periods twice a

² This level of annual economic impact is consistent with a 2009 report by the Nuclear Energy Institute that estimates the average 1,000 MW nuclear plant generates an annual economic impact of \$430 million, based on normalized averages from analyses of 22 U.S. nuclear power plants. Palo Verde generates an average of 4,000 MW per year, with an annual impact that is approximately four times the NEI average. (Nuclear Energy Institute, New Nuclear Plants: An Engine for Job Creation, Economic Growth, October 26, 2009.)

year when there are extra non-local contractors on-site. Due to the transient nature of these non-local contractors, a substantial number of them reside in local hotels, eat at local restaurants, and utilize other local services businesses. This activity will continue for the life of the plant.

- **Pension Spending.** There are also a number of retirees from Palo Verde that live in Arizona and receive monthly pensions estimated at \$1,325 each. To the extent that these pensions are spent locally on goods and services, these retired workers created an annual impact of \$4.7 million on the state in 2009. Pension impacts will continue to increase from 2010 forward as an increasing number of workers at Palo Verde reach retirement age over the next three to five years.
- **Community Contributions.** While supporting the local economy, APS also encourages the employees at Palo Verde to give back to the community. Palo Verde employees logged close to 6,300 volunteer hours in 2008 and 5,050 hours in 2009.
- **Regional Benefits.** In addition to the local economic impacts reported here, Palo Verde creates economic benefits for the entire Southwest Region. Due to its size, Palo Verde is able to take advantage of economies of scale and produce a large volume of power for a competitive price. This power is sold throughout the Southwest by the seven utilities that jointly own the facility. However, since the facility is actually located in Arizona, the majority of the direct and indirect economic benefits of Palo Verde's operations are captured locally.
- **Local Supplier Expansions.** Palo Verde supports local suppliers through vendor purchases as described above, however there are also several instances in which national companies have set up local offices in the West Valley. These offices now serve Palo Verde as well as other local and non-local customers. These companies would not have located in the region had it not been for Palo Verde. One of the companies employs approximately 50 people and has plans to expand over the next several years. Palo Verde made up about 95 percent of their businesses in 2009, but in 2010 and 2011, about 20 to 30 percent of their business is likely to come from other customers. The economic impacts of expansions related to growing their customer base are in addition to the impacts reported here. There are also 36 employees at a local office that employs contractors and employees from other utilities and provides services related to nuclear plant re-licensing for Palo Verde as well as for four other nuclear plants outside of Arizona. These employees in turn create local economic impacts not included in this analysis.

Revenue Impacts

- **Direct Revenue Impacts.** Palo Verde generates a substantial amount of direct property tax revenues to Maricopa County, the community college district and local school districts. These revenue impacts are in addition to the \$1.8 billion economic impact described above. Arizona Public Service Company is the largest taxpayer in the county, primarily due to taxes associated with Palo Verde. Annual property tax revenues from the nuclear generating station are estimated at \$48 million to \$52

million per year. In addition, Palo Verde also generates state, county and city sales taxes, estimated at an average of \$54.7 million per year.

- **Indirect Revenue Impacts.** Palo Verde also generates substantial indirect property, sales and income tax revenues in Arizona through employee spending and property ownership. Indirect revenues are estimated at an average of \$13.8 million per year.

FIGURE 1
SUMMARY OF RESULTS
(Millions of Dollars)

	2008	2013	6 Year Total
PVNGS Operations			
Direct Employees	2,387	2,259	na
Estimated Payroll	\$206.50	\$215.86	\$1,279.90
Contract Employees	415	295	na
Estimated Payroll	\$41.09	\$24.34	\$204.02
Local Vendor Purchases*	\$254.43	\$447.70	\$2,045.23
Local Pension Payments	\$2.83	\$6.67	\$27.83
Annual Economic Impacts on Arizona			
Total Output	\$1,885.03	\$1,790.92	\$9,147.13
Total Personal Income	\$525.78	\$490.43	\$2,495.44
Total Jobs	9,124	8,305	8,305
Annual Direct and Indirect Revenue Impacts			
Direct			
Property	\$49.30	\$47.60	\$293.70
Sales	\$5.83	\$5.80	\$34.72
Indirect			
Property	\$3.29	\$3.00	\$19.66
Sales	\$5.87	\$5.69	\$35.17
Personal Income	\$4.70	\$4.28	\$28.11

*Includes purchases made from non-local companies where services were performed locally.

3.0 Economic Impacts

Operations Impacts

Palo Verde has an annual economic impact of \$1.8 billion on Arizona's economy. It directly and indirectly supports close to 8,800 jobs and \$508.8 million in annual payroll throughout the state, based on estimates for 2009. This includes the impacts of production activity at Palo Verde, as well as the impacts of supplier purchases and employee spending at other local businesses. Approximately 99 percent of these impacts are captured in Maricopa County.

Economic impact analysis is a means for identifying the nature of changes in jobs, personal income and business activity that can occur in a given area as a result of a project or program. Economic impacts include direct and indirect jobs, personal income, and economic activity or output that is generated by the facility through its operations. Indirect impacts are the result of the multiplier effect, and capture supported supplier and consumer businesses and employees throughout Maricopa County and Arizona that benefit from Palo Verde. Multiplier effects are a way of representing the larger economic effects on the local economy. In essence, the multiplier effect represents the recycling of local spending that, in turn, creates new business opportunities.

Direct impacts include the direct value of power generated by Palo Verde, as well as employees and payroll at the facility. Total jobs include local vendors from whom Palo Verde makes purchases, as well as local establishments where employees shop. These local vendors and their employees in turn make additional local purchases that are captured in the total impact estimates. The total impact includes both the direct impacts and the secondary impacts created by other local businesses and their employees. Additional purchases by both Palo Verde and its employees will also occur outside the region and are not represented here.

Vendor Spending

One of the key components of Palo Verde's impact stems from local supplier purchases. Approximately 30 to 35 percent of total vendor spending is either from in-state vendors or from non-local vendors where the service is actually provided in Arizona. Major local purchases include construction services, bulk chemicals, consulting services, engineering services, insurance, water for the cooling towers, and computer hardware. APS supports diversity in its vendor selections with about 15 to 17 percent of in-state purchases coming from woman, minority and veteran owned businesses.

In 2008, Palo Verde made over \$84.9 million in purchases from local vendors, excluding wages paid to contractors, taxes and fees (Figure 2). They made an additional \$169.5 million in purchases from vendors who were not located in Arizona but all services were performed in Arizona for a total of \$254.4 million in 2008. Local supplier purchases for 2009 are estimated at \$223.8 million. This includes \$104.2 million from local vendors and \$119.6 million from vendors where services were performed in Arizona. In Figure 2 below, the local supplier expenditures for Maricopa County include only in-state vendors that are located in the county, versus the statewide direct expenditures that include all Arizona vendors.

**FIGURE 2
ECONOMIC IMPACTS OF LOCAL SUPPLIER PURCHASES
PALO VERDE NUCLEAR GENERATING STATION**

Year	Direct			Total		
	Local Supplier Expenditures	Jobs	Personal Income	Output	Jobs	Personal Income
Maricopa County Impacts						
2008	\$250,171,800	2,451	\$133,738,498	\$442,472,167	4,082	\$200,991,609
2009	\$217,620,186	2,139	\$113,904,405	\$380,164,754	3,518	\$171,089,678
Arizona Impacts						
2008	\$254,434,489	2,552	\$134,650,196	\$456,068,899	4,303	\$202,033,574
2009	\$223,848,901	2,250	\$116,260,886	\$399,419,931	3,757	\$175,024,936

Note: Direct supplier expenditures includes purchases made from non-local companies where services were performed locally.

As purchases are made from local suppliers they, in turn, support jobs and payroll in Arizona. There is also additional local spending that may take place on behalf of the local suppliers that supports additional jobs and payroll. These local supplier purchases support an annual economic impact of \$399 million to \$456 million statewide and support about 3,800 to 4,300 jobs at local vendors. About 95 to 97 percent of these impacts occur in Maricopa County. Note that supplier purchases fluctuate from year to year due to the inclusion of non-recurring construction expenditures.

The supplier expenditures above include vendors that are not located in Arizona, but the service is provided in Arizona and supports local vendor jobs. These purchases from non-local vendors are reduced by 12 percent to account for overhead and administrative costs that are not captured in Arizona.

Employee Spending

Palo Verde currently employs about 2,900 full time employees and contractors with a total payroll of \$255.1 million. The average wage is estimated at \$87,000, which is well above county and state average wage levels. These employees at Palo Verde are professionals and highly skilled craft worker in an industry that tends to be recession proof. These employees represent a substantial amount of purchasing power that supports additional jobs and payroll at local retail and service establishments throughout the region. Based on the Census Consumer Expenditure Survey, it is estimated that employees spend approximately 83 percent of their income on goods and services. Most of this spending occurs locally. Additionally, a sizeable portion of the contractor payroll spending occurs during two 30 to 60 day refueling outage periods twice a year when there are extra non-local contractors on-site. Due to the transient nature of these non-local contractors, a substantial number of them reside in local hotels, eat at local restaurants, and utilize other local services businesses.

Employee and contractor spending created an estimated annual economic impact of \$297.2 million in Arizona in 2009 (Figure 3). Through this spending, Palo Verde indirectly supports 1,950 jobs and \$74.1 million in payroll in Maricopa County and an additional 106 jobs and \$3.4 million in payroll in other parts of the state.

**FIGURE 3
ECONOMIC IMPACTS OF EMPLOYEE SPENDING
PALO VERDE NUCLEAR GENERATING STATION**

Year	Direct			Total		
	Employee & Contractor Spending	Jobs	Personal Income	Output	Jobs	Personal Income
Maricopa County Impacts						
2008	\$205,493,890	1,233	\$44,320,717	\$288,545,273	1,891	\$71,901,490
2009	\$211,692,330	1,270	\$45,657,590	\$297,248,844	1,948	\$74,070,299
2010	\$209,462,950	1,257	\$45,176,760	\$294,118,449	1,927	\$73,290,248
2011	\$205,085,530	1,231	\$44,232,642	\$287,971,872	1,887	\$71,758,607
2012	\$200,553,730	1,203	\$43,255,228	\$281,608,523	1,845	\$70,172,948
2013	\$199,363,510	1,196	\$42,998,522	\$279,937,269	1,834	\$69,756,495
State of Arizona Impacts						
2008	\$205,493,890	1,274	\$39,782,179	\$291,216,283	1,993	\$75,211,456
2009	\$211,692,330	1,312	\$40,982,153	\$300,000,421	2,053	\$77,480,106
2010	\$209,462,950	1,299	\$40,550,561	\$296,841,048	2,032	\$76,664,146
2011	\$205,085,530	1,272	\$39,703,123	\$290,637,574	1,989	\$75,061,995
2012	\$200,553,730	1,243	\$38,825,798	\$284,215,320	1,945	\$73,403,341
2013	\$199,363,510	1,236	\$38,595,380	\$282,528,596	1,934	\$72,967,717

Pension Payments

Workers that have retired from Palo Verde receive an annual pension of approximately \$1,325 per month. Of the 313 retirees since 2000, 82 percent of them still live in Arizona. This results in annual in-state pension payments of about \$4.1 million. To the extent that these pension payments are re-spent locally on goods and services, they created an annual economic impact of \$4.3 million in 2009, increasing to \$4.9 million in 2010 (Figure 4). From 2010 forward, Palo Verde provided information on projected number of retirements, which is expected to increase annually based on the age structure of the workforce and the average retirement age for Palo Verde employees. It was assumed that 82 percent of these future retirees would remain in Arizona.

FIGURE 4
ECONOMIC IMPACTS OF PENSIONS
PALO VERDE NUCLEAR GENERATING STATION

Year	Direct			Total		
	Retiree Pension Spending	Jobs	Personal Income	Output	Jobs	Personal Income
Maricopa County Impacts						
2008	\$2,336,346	14	\$503,901	\$3,280,592	21	\$817,478
2009	\$3,046,122	18	\$656,985	\$4,277,227	28	\$1,065,826
2010	\$3,474,945	21	\$749,473	\$4,879,361	32	\$1,215,869
2011	\$4,173,450	25	\$900,125	\$5,860,170	38	\$1,460,273
2012	\$4,883,041	29	\$1,053,169	\$6,856,547	45	\$1,708,557
2013	\$5,670,245	34	\$1,222,953	\$7,961,903	52	\$1,983,996
State of Arizona Impacts						
2008	\$2,632,086	16	\$509,553	\$3,730,069	26	\$947,524
2009	\$3,341,862	21	\$646,961	\$4,735,930	32	\$1,207,305
2010	\$3,800,259	24	\$735,704	\$5,385,548	37	\$1,373,497
2011	\$4,564,155	28	\$883,589	\$6,468,107	44	\$1,649,586
2012	\$5,340,177	33	\$1,033,821	\$7,567,848	52	\$1,930,057
2013	\$6,201,076	38	\$1,200,485	\$8,787,874	60	\$2,241,205

Note: Includes only pensions paid to retired employees living in Arizona. Pensions average \$1,325 per month.

Overall Economic Impacts

The composite operations impact results presented here are broken down in terms of direct impacts, indirect impacts (supplier purchases), induced impacts (employee spending and pension spending) and total impacts. All total, the operations of Palo Verde will create a total economic impact of \$9.1 billion in Arizona over the next five years. On an on-going basis, the nuclear generating station will create an annual economic impact of \$1.8 billion on the statewide economy, directly and indirectly supporting about to 8,300 jobs and \$489.6 million in annual payroll. This level of annual impact is consistent with recent data from the Nuclear Energy Institute that reported the average 1,000 MW nuclear plant produces an annual economic impact of \$430 million, based on normalized averages from analyses of the economic and employment impacts of 22 U.S. nuclear power plants. The annual economic impacts estimated in this analysis for Palo Verde, a 4,000 MW plant, are approximately four times this level.³

Direct impacts include the direct value of power produced by Palo Verde. Direct jobs represent employees at the nuclear generating station. Total jobs include local supplier businesses where Palo Verde makes purchases, as well as local establishments where employees shop. These supported local businesses and their employees in turn make additional local purchases that are captured in the total impact estimates. The total impact includes both the direct impacts and the secondary impacts created by other local businesses and their employees (Figures 5 and 6). Significant additional purchases by Palo Verde and their employees also occur outside the region and are not represented here.

³ Nuclear Energy Institute, New Nuclear Plants: An Engine for Job Creation, Economic Growth, October 26, 2009.

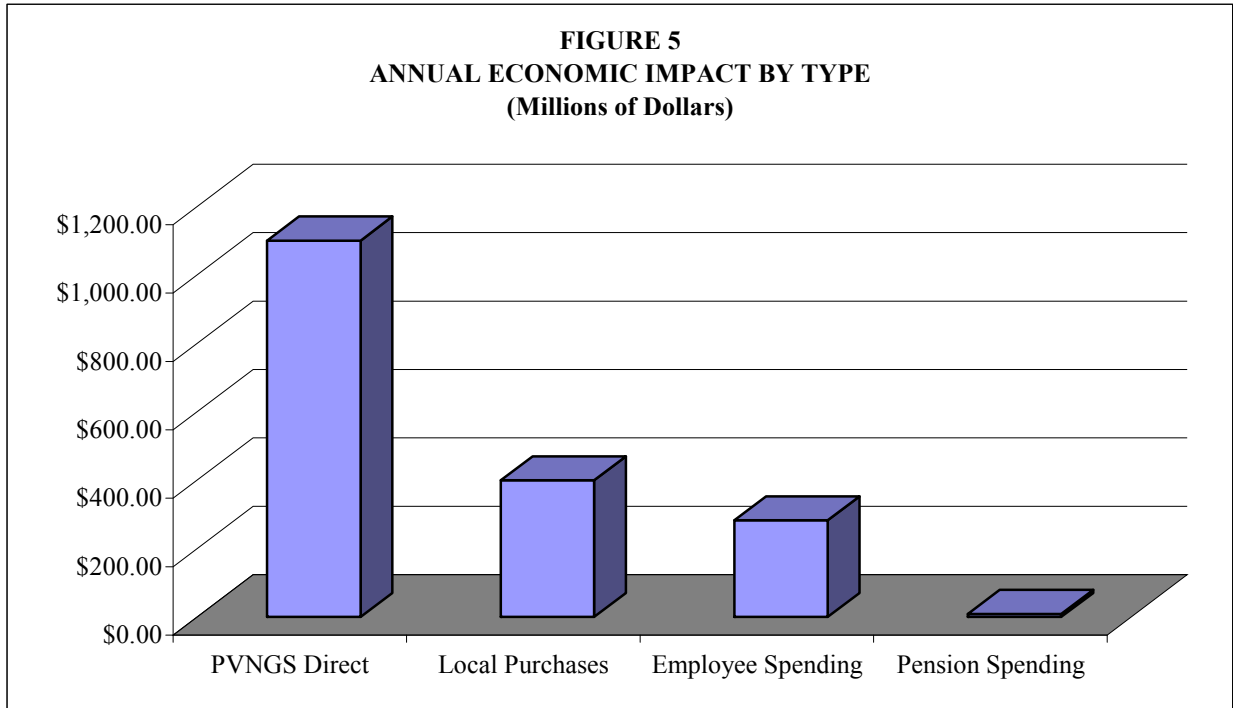


FIGURE 6
ANNUAL DIRECT AND TOTAL OPERATIONS IMPACT OF
PALO VERDE NUCLEAR GENERATING STATION
(millions of dollars)

Year	Direct			Local Supplier Purchases			Employee Spending			Pension Spending			Total		
	Output	Jobs	Personal Income	Output	Jobs	Personal Income	Output	Jobs	Personal Income	Output	Jobs	Personal Income	Output	Jobs	Personal Income
Maricopa County Impacts															
2008	\$1,134.02	2,802	\$247.58	\$442.47	4,082	\$200.99	\$288.55	1,891	\$71.90	\$3.28	21	\$0.82	\$1,868.32	8,796	\$521.29
2009	\$1,168.22	2,922	\$255.05	\$380.16	3,518	\$171.09	\$297.25	1,948	\$74.07	\$4.28	28	\$1.07	\$1,849.92	8,416	\$501.28
2010	\$1,155.92	2,979	\$252.37	\$380.16	3,518	\$171.09	\$294.12	1,927	\$73.29	\$4.88	32	\$1.22	\$1,835.08	8,456	\$497.96
2011	\$1,131.77	2,829	\$247.09	\$380.16	3,518	\$171.09	\$287.97	1,887	\$71.76	\$5.86	38	\$1.46	\$1,805.76	8,273	\$491.40
2012	\$1,106.76	2,679	\$241.63	\$380.16	3,518	\$171.09	\$281.61	1,845	\$70.17	\$6.86	45	\$1.71	\$1,775.39	8,087	\$484.60
2013	\$1,100.19	2,554	\$240.20	\$380.16	3,518	\$171.09	\$279.94	1,834	\$69.76	\$7.96	52	\$1.98	\$1,768.25	7,959	\$483.03
Total	\$5,662.86	na	\$981.28	\$1,900.82	na	\$855.45	\$1,440.88	na	\$359.05	\$29.84	na	\$7.43	\$9,034.40	na	\$2,458.27
Arizona Impacts															
2008	\$1,134.02	2,802	\$247.58	\$456.07	4,303	\$202.03	\$291.22	1,993	\$75.21	\$3.73	26	\$0.95	\$1,885.03	9,124	\$525.78
2009	\$1,168.22	2,922	\$255.05	\$399.42	3,757	\$175.02	\$300.00	2,053	\$77.48	\$4.74	32	\$1.21	\$1,872.38	8,765	\$508.76
2010	\$1,155.92	2,979	\$252.37	\$399.42	3,757	\$175.02	\$296.84	2,032	\$76.66	\$5.39	37	\$1.37	\$1,857.57	8,805	\$505.43
2011	\$1,131.77	2,829	\$247.09	\$399.42	3,757	\$175.02	\$290.64	1,989	\$75.06	\$6.47	44	\$1.65	\$1,828.29	8,620	\$498.83
2012	\$1,106.76	2,679	\$241.63	\$399.42	3,757	\$175.02	\$284.22	1,945	\$73.40	\$7.57	52	\$1.93	\$1,797.96	8,433	\$491.99
2013	\$1,100.19	2,554	\$240.20	\$399.42	3,757	\$175.02	\$282.53	1,934	\$72.97	\$8.79	60	\$2.24	\$1,790.92	8,305	\$490.43
Total	\$5,662.86	na	\$981.28	\$1,997.10	na	\$875.12	\$1,454.22	na	\$375.58	\$32.95	na	\$8.40	\$9,147.13	na	\$2,495.44

The multipliers used in this analysis are from IMPLAN, a national vendor of economic impact software, and are specific to Maricopa County and Arizona. Industry specific multipliers were used for each category of vendor purchases and household consumption multipliers were used to model employee, contractor and pension spending. On average, the output multiplier for the nuclear generating facility is 1.6. This means that for every \$1 million of power produced by Palo Verde, an additional \$600,000 in economic activity is generated in the state's economy. Similarly, for every direct job created at Palo Verde an additional 2 jobs are supported at other businesses in the state.

4.0 Revenue Impacts

In addition to creating demand and supporting jobs and payroll in the state and regional economy, Palo Verde also generates substantial state and local tax revenues. Economic impacts represent the benefits to the private economy, while revenue impacts represent the benefits to state and local government. The facility generates property and sales taxes through its own operations. It also indirectly supports additional revenues through employee spending and property ownership. All total, Palo Verde will generate an average of \$68.6 million per year in direct and indirect revenues to the state, county and local cities between 2008 and 2013.

Direct Revenues

In 2009, Palo Verde alone paid an estimated \$51.6 million in property tax revenues to Maricopa County, the Maricopa Community College District and the local school district, making APS the largest property tax payer in the county (Figure 7). Palo Verde also paid \$5.7 million in sales tax revenues on construction materials and other vendor purchases. About 77 percent of these sales tax revenues will go to the state and the remainder will go to Maricopa County and various local cities.

**FIGURE 7
DIRECT REVENUE IMPACTS
PALO VERDE NUCLEAR GENERATING STATION**

	2008	2009	2010	2011	2012	2013
Direct Revenues	\$55,133,200	\$57,284,500	\$55,800,000	\$53,400,000	\$53,400,000	\$53,400,000
Property Tax	\$49,300,000	\$51,600,000	\$50,000,000	\$47,600,000	\$47,600,000	\$47,600,000
Maricopa County	\$10,500,000	\$10,200,000	\$9,900,000	\$9,400,000	\$9,400,000	\$9,400,000
Community College	\$9,500,000	\$9,300,000	\$9,000,000	\$8,600,000	\$8,600,000	\$8,600,000
Saddle Mountain Schools	\$25,200,000	\$24,700,000	\$23,900,000	\$22,800,000	\$22,800,000	\$22,800,000
Other	\$4,100,000	\$7,400,000	\$7,200,000	\$6,800,000	\$6,800,000	\$6,800,000
Sales Tax	\$5,833,200	\$5,684,500	\$5,800,000	\$5,800,000	\$5,800,000	\$5,800,000
State of Arizona	\$4,510,400	\$4,379,500	\$4,476,714	\$4,476,714	\$4,476,714	\$4,476,714
Maricopa County	\$442,614	\$442,265	\$445,596	\$445,596	\$445,596	\$445,596
Various Cities	\$880,186	\$862,735	\$877,690	\$877,690	\$877,690	\$877,690

Indirect Revenues

Palo Verde employees and contractors living in Maricopa County also generate a significant amount of property and sales tax revenues. Indirect revenue impacts shown here are only for direct employees and contractors of Palo Verde. There are additional indirect revenues generated by indirect employment supported by local supplier purchases and employee spending. Based on residential assessed value per capita, statewide average property tax rates and supported population from Palo Verde, these employees and contractors generated an estimated \$3.4 million per year in indirect property tax revenues in 2009.

Based on employee and contractor payroll at Palo Verde, employees generated approximately \$6.0 million in sales tax revenues in 2009 to the state, county and local cities (Figure 8). This estimate assumes that employees spend approximately 28 percent of their wages on goods that

are subject to sales tax, based on data from the Census Annual Consumer Expenditure Survey. Applying this assumption to personal income of employees and applying a local sales tax rate based on the distribution of employees by place of residents yields local sales tax revenues from employee spending.

In terms of state income tax, Palo Verde employees and contractors generated approximately \$4.9 million in revenues in 2009. State income tax revenues are calculated using average personal income tax liabilities for filers in the appropriate income ranges from the 2009 Annual Report for Arizona Department of Revenue multiplied by the number of direct employees.

FIGURE 8
INDIRECT REVENUE IMPACTS
PALO VERDE NUCLEAR GENERATING STATION

	2008	2009	2010	2011	2012	2013
Indirect Revenues	\$13,853,066	\$14,372,042	\$14,470,827	\$13,918,352	\$13,361,469	\$12,971,249
Property Tax	\$3,286,387	\$3,427,131	\$3,493,985	\$3,318,054	\$3,142,124	\$2,995,515
Personal Income Tax	\$4,698,954	\$4,900,194	\$4,995,783	\$4,744,233	\$4,492,683	\$4,283,058
Sales Tax	\$5,867,725	\$6,044,717	\$5,981,059	\$5,856,065	\$5,726,662	\$5,692,677
State of Arizona	\$3,900,863	\$4,018,527	\$3,976,207	\$3,893,111	\$3,807,085	\$3,784,491
Maricopa County	\$475,882	\$490,236	\$485,073	\$474,936	\$464,441	\$461,685
Buckeye	\$278,633	\$287,038	\$284,015	\$278,079	\$271,935	\$270,321
Phoenix	\$156,906	\$161,638	\$159,936	\$156,594	\$153,134	\$152,225
Glendale	\$154,784	\$159,453	\$157,773	\$154,476	\$151,063	\$150,166
Avondale	\$173,099	\$178,320	\$176,442	\$172,755	\$168,937	\$167,935
Peoria	\$123,123	\$126,837	\$125,502	\$122,879	\$120,163	\$119,450
Goodyear	\$153,555	\$158,187	\$156,521	\$153,250	\$149,864	\$148,974
Litchfield Park	\$127,423	\$131,267	\$129,884	\$127,170	\$124,360	\$123,622
Mesa	\$13,192	\$13,590	\$13,447	\$13,166	\$12,875	\$12,798
Scottsdale	\$6,449	\$6,644	\$6,574	\$6,437	\$6,294	\$6,257
Tempe	\$9,548	\$9,836	\$9,733	\$9,529	\$9,319	\$9,263
Other Cities	\$294,268	\$303,144	\$299,952	\$293,683	\$287,193	\$285,489

Note: Includes only indirect revenues generated by PVNGS employees and contractors, not other indirectly supported employees.

5.0 Labor Shed Trends

One of the determinants of where these economic and revenue impacts will be captured locally, is the distribution of Palo Verde employees by place of residence. The geographic area from which Palo Verde draws its employees makes up its labor shed. As of 2009, the largest share of employees (20 percent) resides in Buckeye. The share of employees living in Buckeye increased from 13 percent only three years ago. Other cities that represent at least 5 percent of Palo Verde's workforce include Phoenix, Glendale, Avondale, Peoria, Goodyear, Litchfield Park, Tonopah and Surprise. About 86 percent of the Palo Verde workforce lives in these 9 cities (Figure 9).

In general, the labor shed has shifted west since 2006, with an increased number of employees living in Buckeye, Avondale, Tonopah and Surprise. There have been slight declines in the number of employees living in Phoenix and Glendale, although these cities still represent a significant share of workers.

FIGURE 9
LABOR SHED TRENDS
PALO VERDE NUCLEAR GENERATING STATION

Employee Residence	2006		2009		Change	
	Employees	Distribution	Employees	Distribution	Employees	Percent
Maricopa County						
Buckeye	279	13%	499	20%	220	79%
Phoenix	284	13%	281	11%	-3	-1%
Glendale	309	14%	252	10%	-57	-18%
Avondale	150	7%	248	10%	98	65%
Peoria	258	12%	245	10%	-13	-5%
Goodyear	239	11%	220	9%	-19	-8%
Litchfield Park	160	7%	163	7%	3	2%
Tonopah	85	4%	114	5%	29	34%
Surprise	80	4%	113	5%	33	41%
Waddell	34	2%	45	2%	11	32%
Wickenburg	47	2%	42	2%	-5	-11%
Chandler	30	1%	36	1%	6	20%
Mesa	31	1%	27	1%	-4	-13%
Gilbert	16	1%	23	1%	7	44%
Tempe	19	1%	19	1%	0	0%
Arlington	13	1%	18	1%	5	38%
El Mirage	18	1%	17	1%	-1	-6%
Scottsdale	9	0%	14	1%	5	56%
Sun City	10	0%	9	0%	-1	-10%
Laveen	3	0%	8	0%	5	167%
Queen Creek	5	0%	8	0%	3	60%
Tolleson	12	1%	8	0%	-4	-33%
Wittmann	8	0%	6	0%	-2	-25%
Sun City West	2	0%	5	0%	3	150%
Palo Verde	0	0%	4	0%	4	400%
Youngtown	2	0%	3	0%	1	50%
Carefree	0	0%	2	0%	2	200%
Cave Creek	3	0%	2	0%	-1	-33%
Paradise Valley	1	0%	2	0%	1	100%
Apache Junction	0	0%	1	0%	1	100%
New River	0	0%	1	0%	1	100%
Fountain Hills	2	0%	0	0%	-2	-100%
Higley	1	0%	0	0%	-1	-100%
Pinal County	4	0%	11	0%	7	175%
Yavapai County	8	0%	11	0%	3	38%
Other Arizona	13	1%	16	1%	3	23%
Outside Arizona	1	0%	10	0%	9	900%

Source: Arizona Public Service Company, 2009.

6.0 Summary

Palo Verde is a significant contributor to the region's economy. It provides a clean, long-term source of power for the growing population of the Valley. It also provides high quality jobs to thousands of workers and supports the local economy with millions of dollars each year in vendor purchases, creating a very significant economic impact in the region and the state. The fact that Palo Verde makes a sizeable share of vendor purchases from Arizona companies greatly increases the multiplier effect in terms of the share of economic benefits that stay in Arizona. These local vendors, in turn, are also more likely to make purchases in-state, resulting in a cascade of economic benefits to the state.