

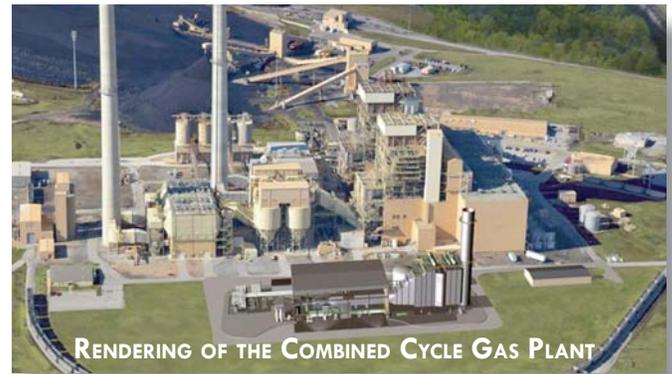
EXECUTIVE SUMMARY

In 2012, the Oklahoma Department of Commerce completed an economic impact study of the Grand River Dam Authority (GRDA), and this report provides an update of those impacts. GRDA continues to invest in power generation in Oklahoma, and with its sizeable investment in a new gas plant at the Grand River Energy Center, the considerable impact that GRDA already has in the state will grow.

The operations, construction and positive externalities from GRDA result in a significant economic impact for in Oklahoma.

Focusing on the operational impact alone, GRDA's economic impact is projected to be:

- \$541 million in economic activity (output) in 2016,
- 2,870 jobs in 2016, and
- \$150 million in real disposable income in 2016.



GRAND RIVER DAM AUTHORITY BACKGROUND

Senate Bill 395 was passed in 1935 as the Enabling Act for the Grand River Dam Authority. It created a conservation district, the purpose of which was to harness waters for power generation and also for flood control within the district. Construction started on the Pensacola Dam in 1938 and it was operational by the end of 1940 at a cost of \$28 million. Some of the financing originated from the Federal Government as a New Deal Public Works Administration project. In current dollars, it would cost more than \$470 million to reconstruct the Pensacola Dam.

Additional hydroelectric power was added in 1962 with the construction of the Robert S. Kerr Dam at a cost of \$40 million. In current dollars, it would cost more than \$310 million to replace the Robert S. Kerr Dam. In 1971, the Salina Pumped Storage Project, which pumps water from a lower reservoir to Lake Hudson, was completed.

Combined, the hydroelectric power generated by the dams on the Grand River total 256 MW of rated capability with an additional 260 MW of hydroelectric peaking power capability from the Salina Pumped Storage Project for a total potential rating capability 514 MW of hydroelectric power.

In the late 1970's, GRDA diversified beyond hydro power to include power generation from the GRDA Coal Fired Complex near MidAmerica Industrial Park and a 36% interest in the natural-gas fired Redbud Power Plant near Luther. Total coal-fired units currently generate 812 MW, and total gas-fired combined cycle generation is 439 MW. In January 2015, GRDA broke ground to construct a combined-cycle gas generation plant to replace a current coal fired unit. GRDA's diverse generation portfolio supports its obligations as a major regional power provider.

GRDA is committed to sustainability and purchases 48 MW of wind-generated electricity from the Canadian Hills wind development. GRDA has contracted to purchase an additional 335 MW in wind-generated electricity from three additional wind developments in Oklahoma due to be operational in Oklahoma in 2017. GRDA's investment in hydroelectric power, wind power and natural gas power is a commitment to sustainability and is appealing to forward-looking companies that are seeking clean and affordable sources of energy to fulfill their energy needs.

In addition to power generation, GRDA delivers electricity over more than 1,200 miles of transmission lines in Oklahoma. The company supplies energy to 75 of the 77 counties in Oklahoma and delivers energy to the Southwest Power Pool.

MODELING THE ECONOMIC IMPACT

Modeling the economic impact of a utility similar to the Grand River Dam Authority requires more than examining the jobs and payroll at the utility. In addition to employment and payroll at GRDA, tourism, quality of life, and relatively low cost power have been included in the simulation of GRDA's economic impact. Communities that have high involvement from their utilities usually enjoy a high quality of life and high property values. These factors have been included in the model.

Quality of life impacts on a region may be demonstrated by population growth. In the 10 years after the Pensacola Dam was finished in 1940, this region's population grew 8.2% compared to the 5.0% decline experienced by Oklahoma's non-metro counties over the same time period. Over a longer period of time (1940-2010), the region around Grand Lake and Lake Hudson posted a 33% population growth rate. Comparatively, Oklahoma's non-metro counties experienced virtually no population growth.

Beyond the clean and renewable power provided by hydro and natural gas generation sources, GRDA's environmental stewardship includes flood mitigation activities as well as the management of approximately 70,000 surface acres of lakes in Northeast Oklahoma. The US Army Corps of Engineers estimates that for every \$1 spent on flood mitigation projects, the benefit to the economy is greater than \$6 in avoided economic costs and damages. Additionally, the management of lakes in Northeast Oklahoma attracts tourism and generates higher property values. Without the proper management of resources, people from outside the state would not be as willing to spend their time and money in water recreation activities on the lakes of Northeast Oklahoma.

With reliable power delivery and electric rates at least 20-45% lower than the national average, GRDA contributes to the state's economic development by attracting companies to the state that value reliable and low-cost electric power. Reliable, low-cost power allows industry to remain competitive in the global marketplace by lowering operating costs leading to increased profitability. Power costs are a factor considered in location and expansion decisions. The relative cost differential has been factored into the economic impact model, which represents an energy cost savings that can be utilized elsewhere.

In addition to a total economic impact presented in the report, GRDA's impact has been grouped into three factors in the following pages.

1. **Operational activities** represent the impacts that are directly associated with the employment and payroll of GRDA in Oklahoma.
2. **Construction and investment activities** reflect the significant outlays that GRDA will invest in a gas-fired combined-cycle unit at the Grand River Energy Center in order to make it operational. While there are other capital investment activities, the combined-cycle gas-fired unit represents the majority of these outlays. Routine capital expenditures, such as maintenance expenditures, were not included in the economic impact simulation as these are already accounted for in the normal business demands of the operational impact.
Construction and investment impacts are temporary and include construction and engineering activities as well as machinery investment activities. Given the nature of building the gas-fired combined-cycle unit, it was assumed that some of the supply chain associated with the machinery investment would be captured by Oklahoma companies. However, with much of the work performed outside Oklahoma, the state will not capture all of the impact associated with construction & investment. The project was assumed to take 3 years and the expenditures were assumed to be equal the first two years and taper off in the third year.
3. **Externalities and Amenities** reflect the impacts associated with quality of life, tourism, and relatively low power costs in the GRDA region discussed above. These positive externalities represent cost savings and amenities that are present and are not captured by the employment and payroll associated with the operations of power generation companies.

ECONOMIC OUTPUT

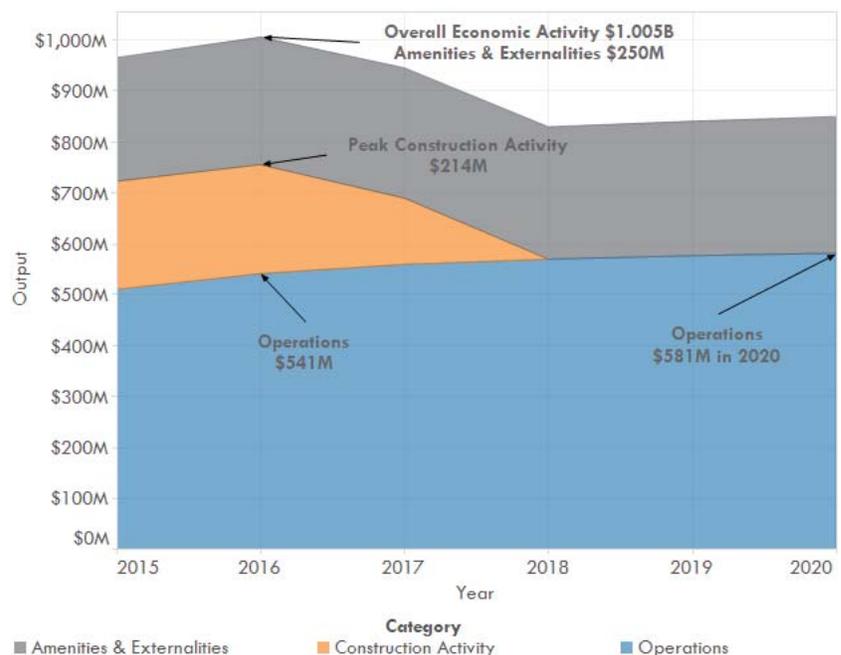
ECONOMIC OUTPUT

Economic output is a measure of the value-added economic activity in the state. This includes the value of intermediary goods along with value-added activities associated with the production of finished goods within the state. For GRDA, this includes the value of the electricity generated (final good) and the value of the goods sold to the company as an input to the production process (intermediary goods). GRDA serves several communities, but it also creates demand for goods and services from local businesses.



2016 OPERATIONAL IMPACTS: \$541 MILLION

- As a result of the Grand River Dam Authority's investment, operations, quality of life and power costs, the Grand River Dam Authority is estimated to facilitate an annual economic activity impact of \$960 million to a little over \$1 billion in Oklahoma's economy during the first two years of construction. This decreases to \$940 million in the last year of construction. The longer term impact, without construction activity, is about \$840-\$850 million.
- Between 2015 and 2020, the Operational impact alone represents economic activity of \$510 to \$581 million in the state's economy. This results from the employment and payroll associated with operating a power generation company.
- The impact resulting from construction and investment activities, most of which are associated with the construction of the combined-cycle gas generation plant at the Grand River Energy Center, are projected to generate \$210 million in additional economic activity in the first year of the project, increase to \$214 million in the second year, and taper off as the combined-cycle gas unit becomes operational.
- The impact resulting from tourism, quality of life and relative power costs are estimated to contribute \$240-\$260 million in Oklahoma's economic activity.



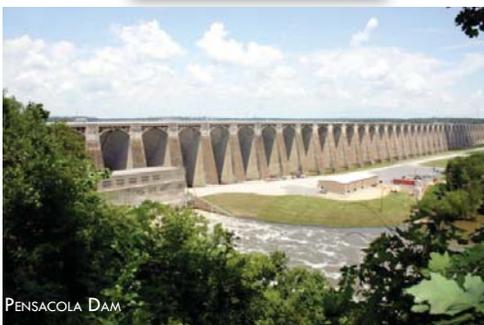
EMPLOYMENT

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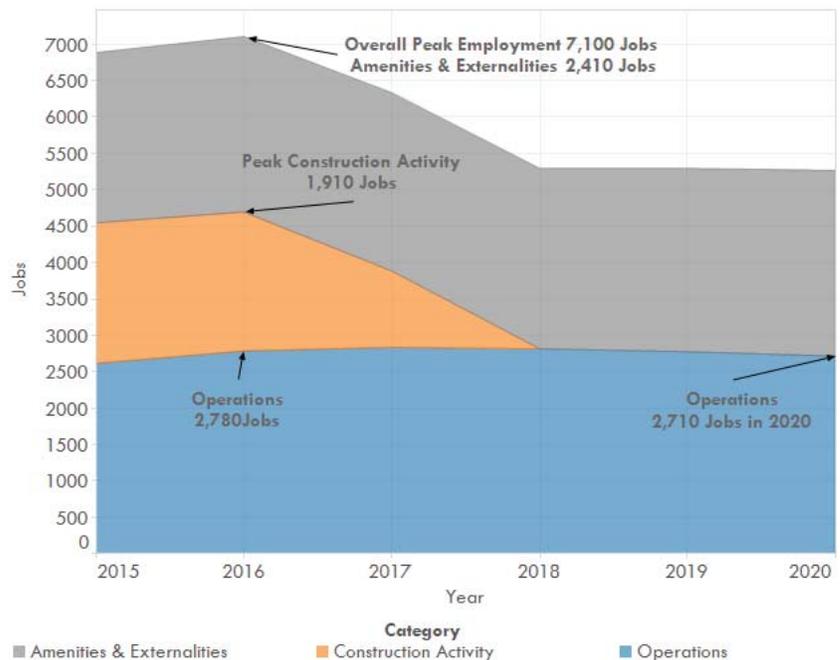
2016 OPERATIONAL IMPACTS: 2,780 JOBS

Employment impacts are not only limited to people directly employed by GRDA, but also include the impacts from the indirect and induced employment impacts. The indirect impacts would include goods and services consumed by GRDA and the induced impacts would include household consumption.

Employment impacts also take into consideration the advantages of producing reliable, sustainable and lower cost energy. These factors improve the competitive position of regional companies and can attract companies seeking reliable, sustainable and lower cost energy.



- As a result of the Grand River Dam Authority's investment, operations, quality of life and power costs, the Grand River Dam Authority is estimated to support over 7,100 jobs in Oklahoma's economy in 2015-2016.
- Between 2015 and 2020, the Operational impact is estimated to support about 40% of the 7,100 jobs mentioned above. Employment impacts range from 2,600 jobs and 2,800 jobs between 2015 and 2018 and taper off to approximately 2,700 jobs through 2020 and remain at those levels in the longer term.
- The impact resulting from construction and investment activities depends on the amount of work performed in Oklahoma to construct the combined-cycle gas generation plant at the Grand River Energy Center. It was assumed that a portion the activity would be performed in the state and some of the activity performed out-of-state. During the construction phase, the employment impact is estimated to be over 1,900 jobs in the first two years of the project and taper off to 1,000 jobs as the project is completed in the third year.
- The impact resulting from tourism, quality of life and power costs are estimated to support over 2,400 jobs in Oklahoma's economy.



REAL DISPOSABLE INCOME

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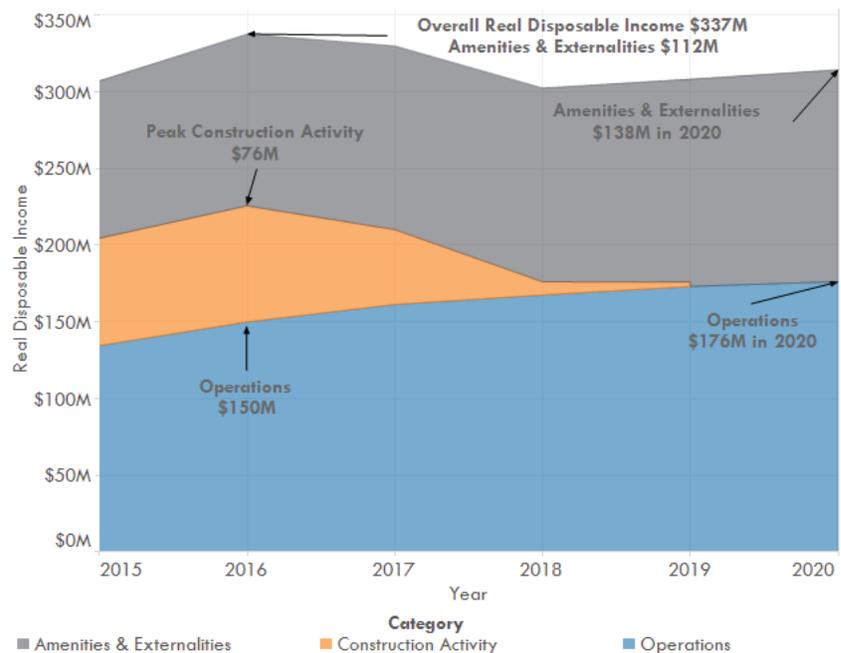
Real Disposable Income is the earned income that is available for spending or saving by workers and their households after paying taxes. Real disposable income is adjusted for expected inflation over time as opposed to disposable income which is a nominal value unadjusted over time.

Highly skilled and educated people are employed by the Grand River Dam Authority. Additionally, many businesses are attracted to the region for reliable, sustainable and lower cost power. These businesses also attract a skilled workforce, and the education and skills obtained by these workers are reflected in the wages and income earned.



2016 OPERATIONAL IMPACTS: \$150 MILLION

- As a result of the Grand River Dam Authority's investment, operations, quality of life, and power costs, the Grand River Dam Authority is estimated to support an annual real disposable income impact of \$310-\$337 million in Oklahoma's economy between 2015 and 2020.
- GRDA's operations are estimated to support between \$150 million and \$176 million in real disposable income in Oklahoma's economy.
- The temporary impact resulting from construction and investment activities is projected to generate \$70 million in additional real disposable income in Oklahoma in the first construction year, grow to \$76 million in the second year and decrease to \$48 million in the last year as the combined-cycle gas unit becomes operational.
- The additional impact resulting from tourism, quality of life and relative power costs is estimated to support \$112-\$138 million in real disposable income impacts in Oklahoma's economy.



LABOR FORCE

LABOR FORCE & OCCUPATIONS

The job opportunities, low electricity rates and overall improved quality of life attract individuals to move to Oklahoma. Many of these individuals have moved with their families in the past and are in the labor force. They were attracted to or remained in the area because of job opportunities in the region. As a component of labor force, occupational information provides additional information about the labor force. Children under 16 are not counted in the labor force.



POWER GENERATORS



GRDA ECOSYSTEMS AND EDUCATION CENTER

2016 OPERATIONAL IMPACTS: 1,250 WORKERS

- GRDA's operations in Oklahoma contribute to a larger labor force in the state. GRDA is estimated to increase the labor force by over 1,250 workers in 2016. Some typical occupations in demand by electric power generation, with median earnings and typical education level, are presented below. This does not necessarily indicate the median earnings at GRDA or the level of education for each of the occupations at GRDA.

- Electrical Power-Line Installers & Repairers; \$22.76; HS diploma or equivalent
- Customer Service Representatives; \$12.85; HS diploma or equivalent
- Power Plant Operators; \$31.21; HS diploma or equivalent
- Supervisors of Mechanics & Installers; \$27.42; HS diploma or equivalent
- Supervisors of Production Workers; \$25.38; Postsecondary non-degree
- Control & Valve Installers & Repairers; \$24.44; HS diploma or equivalent
- Electrical Engineers; \$36.24; Bachelor's degree
- Security Guards; \$11.39; HS diploma or equivalent
- Electrical Repairers, Powerhouse, Substation, & Relay; \$32.42; Postsecondary non-degree
- Meter Readers, Utilities; \$14.16; HS diploma or equivalent
- General & Operations Managers; \$38.41; Bachelor's degree
- Industrial Machinery Mechanics; \$23.6; HS diploma or equivalent
- Electrical & Electronics Engineering Technicians; \$29.71; Associate's degree
- Supervisors of Office & Administrative; \$21.36; HS diploma or equivalent
- Power Distributors & Dispatchers; \$34.79; HS diploma or equivalent

CONCLUSION

With reliable power delivery and retail electric rates approximately 45% lower than the national average, GRDA contributes to the state's development by attracting companies that value sustainable, reliable and low-cost power. Electric reliability, combined with relatively low cost power, allows energy intensive companies to minimize their operating costs, thus improving their bottom-lines and enabling them to be more competitive in the global marketplace.

GRDA is a vital component of Oklahoma's infrastructure and enriches the state's economy and quality of life. While its operational impact is considerable by itself, GRDA's impact on the state economy goes beyond the impacts resulting from employment and payroll. In addition to a substantial impact from capital investment, there is also a sizeable impact resulting from sustainable, reliable and low-cost electric power to the state. The Grand River Dam Authority facilitates economic development and provides stewardship to the state's environmental resources thus enhancing quality of life in Oklahoma.

Sources & Resources:

Source for History, photos and data input into the model: Grand River Dam Authority

Economic Impact Software: REMI Policy Insight+