THE ECONOMIC IMPACT OF ORAN SAFETY GLASS'S OPERATIONS AND INVESTMENTS IN THE COMMONWEALTH OF VIRGINIA

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Abstract

Oran Safety Glass (OSG) develops and produces safety glass at its Emporia, Virginia production facility. We conservatively assume that OSG sources its materials from other states and sells its products to the customers outside of Virginia. We estimate that the total economic impact of OSG's operations in the Commonwealth of Virginia are approximately $400.0 million in 2019 dollars from 2009 to 2019. We also find that OSG's overall impact on nonfarm employment in Virginia climbed from 107 jobs in 2009 to 239 jobs in 2019.

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Executive Summary

Oran Safety Glass (OSG) develops and supplies laminated glass solutions for the defense and security industries, the transportation industry, and a wide variety of special applications. The defense and security division of OSG specializes in glass solutions for a variety of defense, law enforcement, and security-oriented organizations. While OSG is headquartered in Israel where it operates glass production facilities, OSG also manages two glass production facilities in the United States, including one facility in Emporia, Virginia.

Safety glass is one of the products that is made with flat glass. In general, safety glass is composed of layers of glass held together with an interlayer. When the glass is broken, the interlayer keeps the layers of glass bonded and inhibits the shattering of the glass into larger pieces. Ballistic safety glass, for example, is designed to mitigate the impact of small caliber weapons and shrapnel. Much of OSG's work in the United States is focused on defense-oriented applications of its glass products.

OSG's production facility in Emporia currently employs about 130 employees with average sales of $30 to $50 million annually. OSG recently invested $2.5 million in its Emporia facility and plans to add additional equipment and machinery over the next two years. The projected investments will not only diversify OSG's production line but are also expected to increase overall production at the Emporia facility. As a result, OSG expects to create approximately 55 new jobs in the Commonwealth of Virginia by 2021.

We present static estimates of the estimated total economic impact of OSG's investment and employment in Virginia. We use JOBSEQ software, developed by Chmura Economics, which is based on regionalized input-output tables and estimates of relationships between industries. The static estimates provide annual measures of the incremental impact of OSG's operations on economic output in Virginia.

Economic output is a measure of the value of the production of goods and services in an area during a given period. We assume that OSG purchases inputs from other states and sells its products to clients in other states as we do not have specific information on OSG's operations. This approach also provides a more conservative estimate of the impact of OSG's operations on economic output in the Commonwealth.

We estimate the annual incremental change in real (inflation-adjusted) economic output in the Commonwealth from 2009 to 2019 in 2019 dollars. We estimate the incremental impact of Oran Safety Glass on the Virginia economy increases from approximately $21.9 million in 2009 to $58.4 million in 2019. We estimate the total economic impact of OSG's operations in the Commonwealth of Virginia from 2009 to 2019 to be approximately $400.0 million. We estimate that for every $1 of OSG sales, an additional $0.84 of economic activity is created in Virginia. Likewise, every job created by OSG in Virginia yields approximately 0.68 more jobs in the Commonwealth. We estimate that OSG's direct employment increased from 50 in 2009 to 130 in 2019, leading to an increase in overall employment in the Commonwealth from 107 in 2009 to 239 in 2019.

Introduction

Oran Safety Glass (OSG) develops and supplies laminated glass solutions for the defense and security industries, the transportation industry, and also a wide variety of special applications. The defense and security division of OSG specializes in glass solutions for a variety of defense, law enforcement, and security-oriented organizations. While OSG is headquartered in Israel where it operates two glass production facilities, OSG also manages two glass production facilities in the United States, including one facility in Emporia, Virginia. OSG's expansion into the U.S. market was, in part, driven by the rapid expansion in the demand for laminated glass. Current projections estimate that the value of the flat laminated glass market in the U.S. will exceed $40 billion by 2025.

OSG's production facility in Emporia, Virginia currently employs about 130 employees with average sales of $30 to $50 million over the past decade. OSG recently invested $2.5 million in its Emporia facility and plans to add additional equipment and machinery over the next two years. The projected investments will not only diversify OSG's production line but are also expected to increase overall production at the Emporia facility. As a result, OSG expects to create approximately 55 new jobs in the Commonwealth of Virginia by 2021.

In this report, we estimate the total economic impact of OSG's operations and investments in the Commonwealth of Virginia from 2009 to 2019. OSG's operations and investments ripple throughout the Virginia economy so that its overall economic impact is larger than its direct employment and investment. We estimate that for every $1 of OSG investment, an additional $0.84 of economic activity is created in Virginia. Likewise, every job created by OSG in Virginia yields an additional 0.68 jobs in the Commonwealth.

The remainder of this report is structured as follows: In the second section, we briefly review the operations of Oran Safety Glass in Virginia. We then discuss the methodology and the assumptions underlying the economic impact estimates in the third section. The fourth section presents the economic impact estimates. The last section concludes.

A Brief Background on Flat Glass

How glass is cast when it is in its molten state determines its final shape. When molten glass is dispersed over a plane, it makes a product called **flat glass** or plate glass. Flat glass can be rolled or made by broad sheet. Flat glass can also be bent after it is cast, a desirable property in the transportation industry. Layering multiple planes of flat glass can yield a final product that is relatively light yet surprisingly effective in protective capabilities.

While estimates about the size of the global flat glass market vary, there is broad consensus that the global market will grow rapidly over the coming decade. The construction industry is becoming increasingly reliant on flat glass for windows, railings, skylights, and other features. The solar energy industry uses flat glass in the production of solar panels and, given the significant rise in solar energy investments globally, flat glass demand is expected to rise accordingly. Laminated glass products which are used in the construction, transportation, and security industries (among others), also continue to increase in demand (IMARC Group, 2019; Market Reports World, 2019; Research and Markets Limited, 2019). Recent reports project that the overall size of the United States' flat glass market will grow at an annual rate of nearly ten percent through 2025 (IMARC Group, 2019).

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Oran Safety Glass

OSG produces a range of products for a variety of industries. OSG provides commercial construction products such as heavy impact/protection glass, insulated and infrared radiation blocking glass, light-weight compositions, and special curves and blends of glass compositions. OSG also produces windshields and side windows for automobiles and high-speed locomotives, anti-vandalism glass, and recently introduced glass with embedded displays. Additionally, OSG provides safety glass products for defense and security applications, including ballistic protection (which covers bullets, blast, and fragment strikes) for a variety of land and marine platforms.

As demand of OSG products increased in the United States in the early 2000's, OSG decided to open a production facility in the southeastern United States. After scouting locations in North Carolina and Virginia, OSG selected Emporia, a city in Virginia, as the site for its new manufacturing facility. OSG invested approximately $4.2 million in the production facility to make ballistic glass for military vehicles. The Commonwealth provided financial incentives, including a $125,000 grant from the Governor's Opportunity Fund and $125,000 from the Virginia Tobacco Indemnification and Community Revitalization Commission (Glassonline, 2006). Approximately 50 employees worked at the facility after construction was complete.

In 2009, OSG invested an additional $2.2 million in the Emporia plant, increasing average employment to approximately 75 employees. In 2017, OSG and the Commonwealth of Virginia announced that OSG would again expand its Virginia facility. OSG would invest $4.45 million and

create an additional 55 manufacturing jobs. The Commonwealth provided financial incentives to aid OSG's investment and expansion of its existing workforce by 55 jobs. These incentives came in the form of the Commonwealth's Opportunity Fund ($150,000) and the Tobacco Region Opportunity Funds ($235,000) from the Virginia Tobacco Region Revitalization Commission (Area Development News Desk, 2017; Emporia News, 2017). The OSG glass plant produces all types of OSG products for sale throughout the United States.

At the end of 2019, the OSG facility in Virginia employed approximately 130 employees. Most of the employees were engaged in the manufacturing field, earned between $13 and $14 an hour, and worked 40 hours a week. The Bureau of Labor Statistics tracks average weekly wages of all employees in the manufacturing industry, as well as average weekly wages in total private nonfarm employment. Average weekly wages for the manufacturing sector in Emporia were higher than average weekly wages for total private nonfarm employment in Emporia, in part due to the presence of the OSG facility. The planned addition of new technology and machinery in OSG's Virginia location will not only add to OSG's production capacity, but also increase the number of manufacturing jobs in an economically distressed region.

OSG credits the involvement of the Virginia Israel Advisory Board (VIAB) with its initial decision to locate in the Commonwealth and noted publicly that VIAB was instrumental in working with the Governor's office and other entities in the Commonwealth government. When Governor Terry McAuliffe spoke about the most recent expansion in 2017, VIAB was present and a participant in the announcement. OSG viewed, and continues to view, their work with VIAB as a partnership as OSG was able to draw upon VIAB's expertise to ensure that its investments were handled with "utmost care."

The Importance of Manufacturing Jobs – OSG and Commonwealth Policy

Growing manufacturing employment in Virginia has and continues to be a foundation of economic policy. Manufacturing employment compensation is typically higher than average compensation for the private sector. Workers at all ages and levels of education are able to find employment within manufacturing. Leaders within the Commonwealth have recognized how crucial manufacturing is in the creation of jobs. As such, economic development efforts have focused on bringing companies to Virginia, especially if those companies locate in relatively more rural areas of the state.

The Commonwealth's Department of Planning and Budget spoke to the importance of the manufacturing industry in their most recent Fiscal Impact Statement. The statement discusses the 60 new projects within the manufacturing and supply chain sectors. These projects represent approximately 6 billion dollars in investment and over 8,000 jobs. Undoubtedly, manufacturing employment is crucial to economic development in the Commonwealth.

In many ways, the Commonwealth's strategy for growth within this sector is to focus on shipbuilding, mechanics and repairs, and transportation. Manufacturing of mechanical equipment, as well as parts for military equipment and passenger vehicles complements this growth strategy. Oran Safety Glass is one elements of Virginia's success story. Oran Safety glass is located in a more rural part of the Commonwealth and has created relatively well compensated manufacturing jobs. As Oran Safety Glass has expanded over the previous decade, it has increased employment and its corresponding economic impact. The importance of these expansions is highlighted by the fact that multiple governors have announced the location and expansion of OSG in the Commonwealth.

A Short Primer on Economic Impact Analysis

To estimate the impact of OSG's investment and production for its Emporia production plant, we quantify the direct, indirect, and induced economic impacts. We focus our analysis on the impact of OSG's investments in 2009 and 2018 and its average annual employment from 2009 to 2015. We conservatively use the lowest average levels of employment for our estimates to provide a lower-bound on the economic impact of OSG on the Virginia economy. We also explicitly assume that inputs are sourced from outside the Commonwealth and sales are made to customers outside Virginia, as we do not have data on input purchases and sales.

To understand our approach, it is helpful to imagine a pebble dropped into a puddle of water to visualize how the economy reacts to a change in investment in a glass production facility. The impact represents the initial round of economic activity on output, earnings, and employment. The initial round of economic activity ripples through the rest of the economy like the waves moving through the puddle. These ripples represent the indirect and induced impacts that come about through the interconnectedness of the local economy. The indirect economic impact comes from economic activity by suppliers to OSG. The induced impact comes from industries directly and indirectly affected by OSG's investments and operations in Virginia.

These spillovers can create a total economic impact that is larger than the direct impact. The notion of an economic multiplier summarizes the total economic impact of a change in economic activity. If a firm invests a $1,000,000 (direct impact) that generates $300,000 in indirect economic impacts and $200,000 in induced economic impacts, then the economic impact multiplier effect is ($1,000,000 + $300,000 + $200,000) / $1,000,000 = 1.5.

There are two important considerations when evaluating economic multipliers. First, the size of the multiplier inherently depends on how much of the economic activity continues to recycle within the region. If a firm obtains most of its materials from outside of the region (a "leakage"), then the actual multiplier effect will necessarily be smaller. Second, the multiplier effect, where spending spills over to a variety of other sectors, is great when the direct impact is positive; however, it is equally painful when there is a reduction in direct economic activity. From an economic impact perspective, "new" money that is "injected" in a state has a greater economic impact than "old" money that is "redistributed" from existing spending in a state.

We present static estimates of the estimated total economic impact of OSG's investment and employment in Virginia. We use JOBSEQ software, developed by Chmura Economics, which is based on regionalized input-output tables and estimates of relationships between industries. The static estimates of the estimated total economic impact "lump" the investment spending and employment into an annual period and there is no feedback mechanism. We also caution the reader that we employ data on average employment and assume the timing of investments occurs within one year. A lack of data on inputs and sales requires an assumption that excludes these impacts from the analysis.

We also must assume that the multipliers do not change over the period of analysis. The estimated impacts on output may be sensitive to changes in these assumptions and the estimates should be viewed as conditional on the data. This approach avoids the possibility of double counting the impact of OSG's operations on the Virginia economy and provides a more conservative estimate of the overall economic impact of OSG's operations on the Commonwealth economy.

Estimating the Economic Impact of Oran Safety Glass

To estimate the total economic impact of OSG's operations in the Commonwealth of Virginia from 2009 to 2019, we must first estimate the flow of investment expenditures and employment. Table 1 illustrates our estimates regarding these key variables.

Economic output is a measure of the value of the production of goods and services in an area during a given period. Figure 1 displays the annual incremental change in nominal output in the Commonwealth of Virginia from 2009 to 2019. The incremental impact of OSG on the Virginia economy increases from $21.9 million in 2009 to $58.4 million in 2019. In other words, the Commonwealth's economic output was $58.4 million higher in 2019 due to the presence of OSG's facility. Table 2 provides estimates for output, employment, and compensation.

To estimate the cumulative impact on output across time, we must convert the nominal impacts in Figure 1 to real (inflation-adjusted) terms. Figure 2 displays the real (inflation-adjusted) impact of OSG's operations on output in Virginia. We estimate that the total economic impact of OSG's operations in the Commonwealth of Virginia to be approximately $400.0 million in 2019 dollars over the 2009 - 2019 time period.

Figure 3 displays the impact of OSG's investments and continued operations on private nonfarm employment (jobs). While OSG's direct employment increases from 50 in 2009 to 130 in 2019, overall employment in the Commonwealth increases from 107 to 239 over this period. If the increases in investment spending were not associated with increases in OSG employment, then the impact on employment in Virginia would be fleeting. However, as OSG's investments increase the capacity and diversity of its facility, and have and will increase the number of jobs, there are positive spillovers in the Virginia economy.

Table 1

Estimated Investment and Employment

Oran Safety Glass Production Facility in Virginia

2009 – 2019

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Investment Spending (In Millions of Nominal Dollars)	$2.2	$0	$0	$0	$0	$0	$0	$0	$0	$4.45	$0
Employment	50	75	75	75	75	75	75	75	75	75	130

Source: OSG and the Dragas Center for Economic Analysis and Policy. Investment spending is in millions of nominal dollars. Employment is measured in full-time jobs in flat glass manufacturing.

Figure 1

Estimated Impact on Economic Output

Oran Safety Glass Operations in the Commonwealth of Virginia

Millions of Nominal Dollars

2009 - 2019

Source: Dragas Center for Economic Analysis and Policy (2020) and Bureau of Economic Analysis (2019). The estimates represent the contribution of employment and investment to economic output in the Commonwealth for each year. The estimates assume that the multipliers for employment and investment are constant for the period. Data on average employment and investment obtained from OSG.

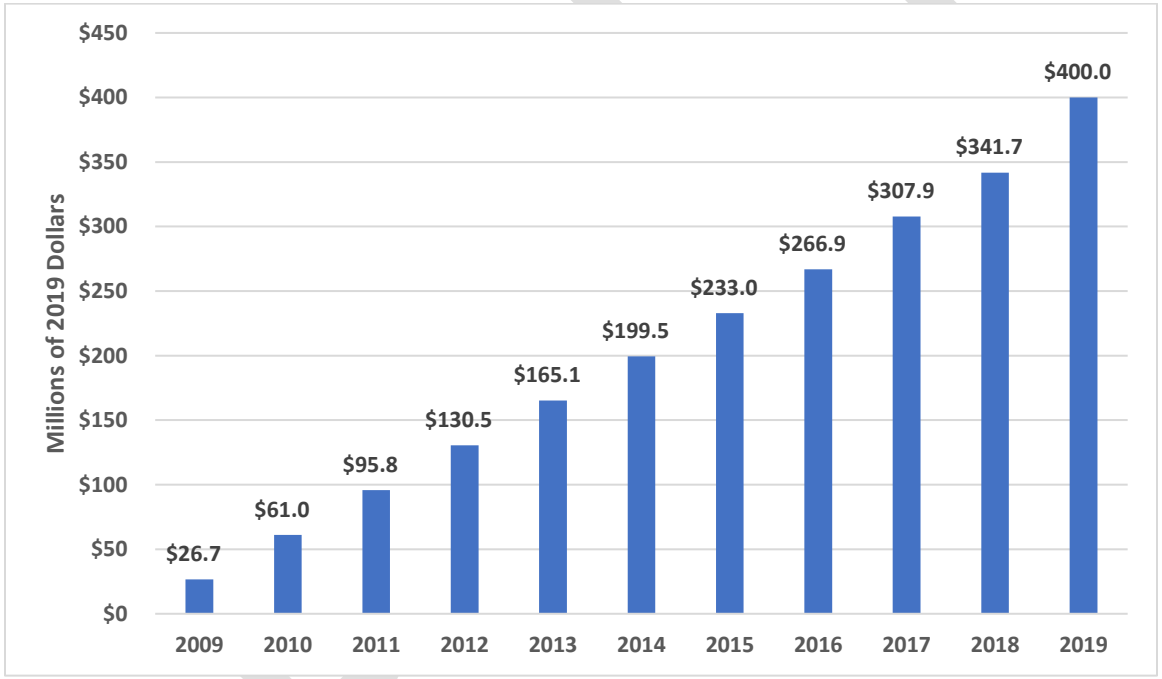
Figure 2

Cumulative Impact on Economic Output

Oran Safety Glass Operations in the Commonwealth of Virginia

Millions of 2019 Dollars

2009 - 2019



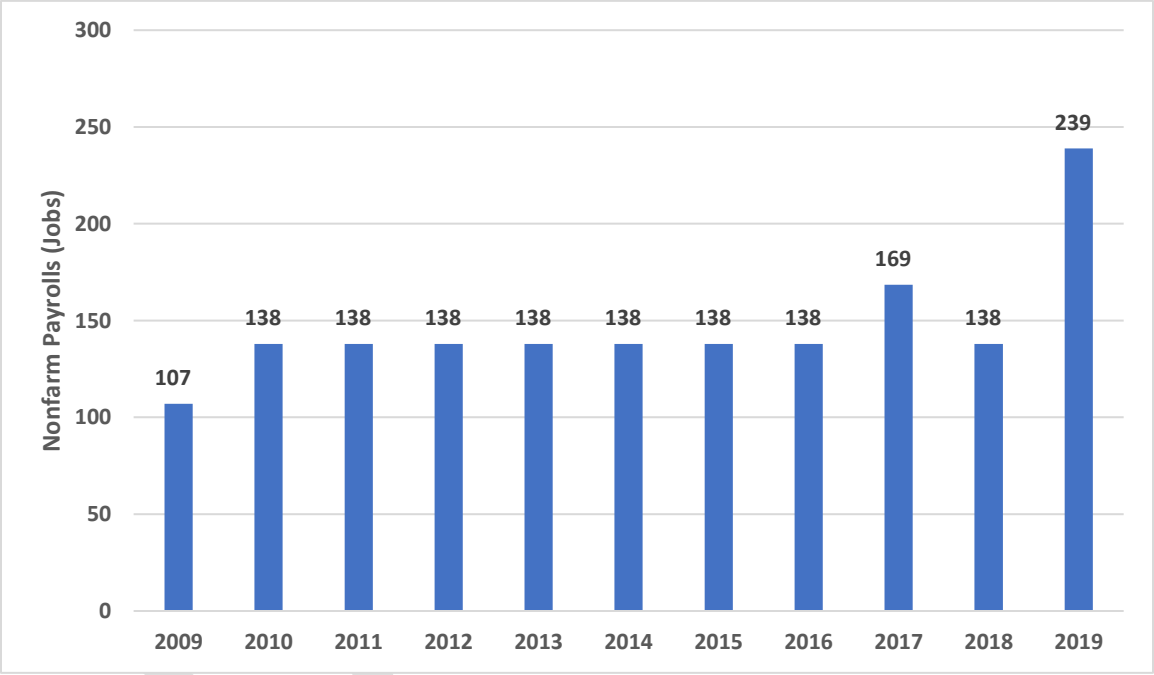
Source: Dragas Center for Economic Analysis and Policy (2020) and Bureau of Economic Analysis (2019). The nominal estimates in Figure 1 are converted to 2019 dollars using the Consumer Price Index for All Urban Consumers. The estimates represent the cumulative impact of employment and investment for OSG's operations in the Commonwealth under the assumptions stated for Figure 2.

Figure 3

Estimated Annual Economic Impact on Private Nonfarm Payrolls (Jobs)

Oran Safety Glass Operations in the Commonwealth of Virginia

2009 - 2019



Source: Dragas Center for Economic Analysis and Policy, 2019. The estimates represent the impact of OSG's operations in the Commonwealth on nonfarm employment given information on OSG's average employment and specific investments over the period.

Table 2
Estimated Incremental Economic Impacts
Oran Safety Glass Operations in the Commonwealth of Virginia
2009 – 2019

Year	Employment	Sales/Output	Compensation
2009	107	$21,941,098	$6,674,706
2010	138	$28,731,969	$8,740,558
2011	138	$29,634,054	$9,014,982
2012	138	$30,248,423	$9,201,879
2013	138	$30,691,856	$9,336,776
2014	138	$31,187,674	$9,487,609
2015	138	$31,224,938	$9,498,945
2016	138	$31,621,498	$9,619,582
2017	169	$39,448,910	$12,000,761
2018	138	$33,083,473	$10,064,330
2019	239	$58,384,324	$17,761,107

Source: JOBSEQ (2019) and Dragas Center for Economic Analysis and Policy. Estimates are in nominal dollars and are based on assumptions regarding OSG's employment and sales based on averages provided by OSG. Estimates include employment and investment impacts only. Estimates include the direct, indirect, and induced impacts and assume that the multipliers are constant for the period of analysis.