DIRECT TESTIMONY OF
ROGER TUTTEROW, PH.D.
ON BEHALF OF
GEORGIA ASSOCIATION OF MANUFACTURERS
DOCKET NO. 44280

Q. PLEASE STATE YOUR NAME, TITLE AND BUSINESS ADDRESS.

A. My name is Roger Tutterow. I am Professor of Economics at Kennesaw State University, 560 Parliament Garden Way, Kennesaw, GA 30144.

Q. PLEASE SUMMARIZE YOUR EDUCATIONAL AND PROFESSIONAL BACKGROUND.

A. I received a Bachelor of Science in Decision Sciences from Berry College, a Master of Arts in Economics and a Doctor of Philosophy in Economics, both from Georgia State University. Subsequent to my graduation, I taught at West Virginia University in Morgantown, West Virginia before accepting a position at Kennesaw State University. At Kennesaw State University, I served as a tenured professor in the Department of Economics & Finance. From 1995 to 2005, I served as Chair of that department. In 2005, I moved to Mercer University where I served as Dean of the Stetson School of Business during 2005 and 2006 and as a tenured Professor of Economics from through 2014. In 2014, I returned to Kennesaw State University as a tenured Professor of Economics. I also serve as Director of the Econometric Center and hold the Henssler Financial Endowed Chair. I have taught a variety of courses in economic theory, finance theory and quantitative analysis at the undergraduate and graduate level. In addition, I conduct research, speak to professional groups and serve as a consultant to businesses. I also have provided

expert testimony on economics, financial and statistical matters in state and federal court, before the Georgia General Assembly and before this Commission in the 2004, 2007, 2010, 2013 and 2019 Georgia Power Company Rate Cases.

Q. IN ADDITION TO THESE QUALIFICATIONS, HAVE YOU SERVED IN ANY OTHER CAPACITIES THAT WOULD GIVE YOU SPECIAL EXPERTISE AND INSIGHT WITH REGARD TO THE GEORGIA ECONOMY?

A. Yes. From 2003 until 2011, I served on the Council of Economic Advisors to Governor Perdue. From 2011 through 2019, I served in that capacity for Governor Deal. I currently serve on the Council for Governor Kemp. In 2010, I was named to serve on the Special Council on Tax Reform and Fairness for Georgians, which was charged with conducting a comprehensive review of Georgia's tax code and recommending changes to the General Assembly.

Q. WHAT ARE THE PURPOSES OF YOUR TESTIMONY?

A. The purposes of my testimony are:

(1) To describe the importance of manufacturing to the Georgia economy;

(2) To address the impact of energy costs on manufacturing and outline the regional and global competitive pressures that impact manufacturing and distinguish manufacturing from other classes of customers served by Georgia Power Company ("Georgia Power");

(3) To discuss the economic changes that have occurred since my last testimony before the Commission;

(4) Relative to this rate case, to emphasize the importance of a Commission decision that recognizes the importance of manufacturing to the Georgia

economy and policies that encourage continued growth and investment by manufacturers in the state; and

(5) To support the retention of any existing rate design or other mechanisms that promote the goal of a healthy manufacturing base in Georgia, as well as the adoption of positions and proposals that will further that goal in light of the harshly competitive environment posed by surrounding states and other countries as locations for potential manufacturing investment.

I. THE IMPORTANCE OF MANUFACTURING TO GEORGIA

Q. WHY DOES MANUFACTURING MATTER TO GEORGIA?

A. As I have argued in the past, it remains critical to recognize the importance of manufacturing when considering matters of public policy. Manufacturing matters to Georgia for several reasons: (1) it creates wealth for local communities; (2) it remains a significant contributor to Georgia employment; (3) it pays premium compensation to its employees; (4) it plays a disproportionate and important role in the economies of Georgia's smaller communities and local areas; and (5) it produces the largest positive multiplier or "spillover" effects that support related industries and other sectors of the economy.

Q. PLEASE DESCRIBE WHAT YOU MEAN BY CREATING WEALTH FOR LOCAL COMMUNITIES.

A. When assessing the impact of a business or sector on a community, it is crucial to recognize the role of that business in "wealth creation"; that is, the degree to which that business or sector creates wealth in the community rather than redistributing wealth that is already present. For this reason, economic developers have long recognized the export-based model of economic growth. Under the export-based

growth model, the ability of a region to grow is linked to the presence of industries that export their products outside that region. In its crudest form, one could argue that, in the absence of the ability to export products outside a region, the inhabitants are selling goods and services to each other and thus only redistributing the collective wealth of the community.

Q. AREN'T THERE SOME SERVICES THAT ARE EXPORTED OUT OF STATE?

A. Yes. Major urban areas that are hubs for professional services do, in fact, export those services to some customers outside the region. One example would be a law firm that serves clients from other states. Likewise, an information technology firm that sells software to businesses in other communities, states or countries also "creates wealth." However, manufactured products are distinctive because of the degree to which they are sold outside their region, or even country, of production. For example, at the national level, goods comprised 69% of U.S. exports in 2021. Over 52% of these exported goods were manufactured capital and consumer goods. The remainder, which include agricultural products and industrial supplies, are products that also include a manufacturing component.

Q. HOW MUCH DOES MANUFACTURING CONTRIBUTE TO GEORGIA EMPLOYMENT?

A. Manufacturing employment remains significant in Georgia. As of August 2022, the manufacturing sector provided roughly 412,900 jobs in Georgia – or about 8.6% of all non-agricultural employment. In terms of output, the role of manufacturing in the Georgia economy is even more pronounced. For 2021, the manufacturing sector accounted for $64.9 billion, or 9.4%, of Georgia's Gross Domestic Product. Further, if one factors out the public sector, then manufacturing accounted for

10.6% of the private industry component of Georgia's GDP – or roughly $1 in every $9.47 of Georgia's private economic output.

Q. HOW DOES GEORGIA'S MANUFACTURING OUTPUT COMPARE WITH OTHER STATES?

A. Georgia is the 11th largest state in the nation in terms of the value of its manufacturing output. By way of comparison, the value of manufacturing's output in Georgia is larger than the manufacturing output of the smallest 33 states combined.

Q. WHAT HAS BEEN THE EXPERIENCE OF GEORGIA'S MANUFACTURING BASE OVER THE LAST 15 YEARS?

A. Manufacturing's share of nonagricultural employment in Georgia stands at 8.6%. Georgia lost a significant number of manufacturing jobs during the "Great Recession" of 2008-09, but this subsequently stabilized at roughly the same level from 2010 to 2019. Manufacturing's share of employment fell again, modestly, during the COVID-19 pandemic, but again has been restored to its prior levels. This recent shift to manufacturing expanding more in line with broad employment is likely, to some degree, the effect of shifts in state policy including the tax treatment of energy and the recognition of manufacturing's importance in decisions by this Commission. It is important that the Commission continue this recognition and not make decisions that would impair this stabilization or to discourage future investment in manufacturing.

Q. TO WHAT EXTENT DOES MANUFACTURING PAY PREMIUM COMPENSATION TO ITS EMPLOYEES?

A. Manufacturing is distinguished from many other economic sectors because of the higher-than-average compensation it provides. For example, during 2021, average weekly wages in manufacturing were approximately 1.9% higher than the *statewide* average for non-manufacturing employment, but importantly, outside of the Atlanta Metropolitan Statistical Area ("MSA"), manufacturing wages exceed non-manufacturing wages by 16.6%. Thus, the premium of compensation that is paid by manufacturers is even greater – and significantly so – in the less urban regions of the state. In many rural communities, a local manufacturer is both the largest and best compensating employer.

However, even comparing average weekly wage data understates the premium in total compensation paid by manufacturing firms because it does not capture the value of employer–provided fringe benefit packages. At the national level, employers' actual contributions to discretionary fringe benefit programs were 27.4% higher in goods-producing firms than for service-producing firms.

Q. CAN YOU DISCUSS THE DISPROPORTIONATE IMPACT THAT MANUFACTURING HAS ON GEORGIA'S MORE RURAL COMMUNITIES?

A. Manufacturing plays a disproportionately large role in the rural economies of Georgia. In August 2022, manufacturing represented 5.9% of non-agricultural employment in the Atlanta MSA and 12.9% of employment outside of the Atlanta MSA. In other words, manufacturing employment comprises twice as large a percentage of employment outside the 28-county Atlanta MSA as it does inside the Atlanta MSA.

Q. WHAT DO YOU MEAN BY THE "MULTIPLIER EFFECT" AND WHY IS IT CRITICAL FOR UNDERSTANDING THE IMPORTANCE OF MANUFACTURING?

A. When evaluating the importance of various sectors of the economy, it is important to recognize the broad impacts of spending in one sector upon activity in other sectors. The indirect and induced spending associated with manufacturing creates a "multiplier effect" of the employment directly associated with manufacturing.

Q. CAN YOU DESCRIBE THE INDIRECT AND INDUCED EFFECTS?

A. Sure. When a manufacturing firm purchases products, services or raw materials from local suppliers, employment by the supplier enterprises is enhanced. This is known as the indirect effect. Further, when the employees of a manufacturer or its suppliers spend their wages in their community, that spending also supports employment at a variety of businesses. This is known as the induced effect.

The size of the "multiplier effect" in manufacturing is confirmed by data from the U.S. Department of Commerce. Based on its 2021 Input-Output Accounts Data and 2020 Regional Data, the manufacturing sector has a total requirements multiplier of 2.31. In other words, every dollar of final demand for manufactured products generates an additional $1.31 in demand for products that are required to produce the original manufactured product.

Of the fifteen sectors in the Department of Commerce classification, the manufacturing sector had the highest multiplier effect.

Of course, the multiplier effects of manufacturing spill over broadly into most industries in the economy. Of the $1.31 in additional product demand associated

with the multiplier for manufactured products, over $0.74 of that demand is for products outside the manufacturing sectors. The professional and business services, mining, agriculture and wholesale trade sectors benefit the most from manufacturing's multiplier effect. For example, for each dollar of final demand for manufacturing products, there is an associated demand of over $0.14 in demand for professional and business services and over $0.13 of activity in wholesale trade. Finally, these multipliers reflect linkages between the final demand for manufactured products and the associated demand for products from other industries. However, they do not capture the effect of the induced spending of employees at the manufacturing and associated businesses in their communities. Given the competitive compensation paid by the manufacturing sector, that induced spending is likely quite significant.

II. THE IMPACT OF ENERGY COSTS ON MANUFACTURERS

Q. DO INCREASES IN ENERGY COSTS IMPACT THE ABILITY OF MANUFACTURERS TO CONTINUE PRODUCTION AND COMPETE EFFECTIVELY?

A. Yes. Higher electricity rates raise the cost to businesses of producing goods and services. Funds available to finance capital investment are lowered as well. For industrial customers, electricity is not consumed as a final product itself, but rather, is an input into the process through which they produce goods. To use the syntax of microeconomics, energy is a "factor of production" rather than consumption good. As with other factors of production, higher energy rates will increase the cost to industrial customers of producing goods. This increase in cost likely will lead to a reduction in competitiveness, lower production and employment or both, depending on the ability of the business to pass on the higher production cost. In a

competitive global marketplace, manufacturers find it difficult to pass along increased costs of production such as the cost of electricity.

Q. WHY CAN'T MANUFACTURERS SIMPLY PASS ALONG THESE COSTS IN THE PRICE OF THE PRODUCTS THEY SELL?

A. In the current competitive environment for manufacturers, it is not easy or even possible to do in many cases. Global competition, especially from low production cost areas of the world, serves as a strong constraint on the ability of manufacturers to pass along cost increases to customers. Customers are more likely to press manufacturers for lower prices than to pay more for the products they produce. Manufacturers, then, are constantly challenged to lower their costs of products to compensate for higher raw material, labor, and energy costs. There are practical limits, including regulatory restrictions, on their ability to do so. When manufacturers cannot meet these pressures, they generally lose customers to a lower cost producer, in many cases from another region or country.

Q. CAN HIGHER ENERGY COSTS IMPACT A MANUFACTURER'S DECISION AS TO WHERE TO LOCATE PRODUCTION?

A. Yes. Facing the pressures of surviving in the current environment, manufacturers need to maintain a competitive cost structure in order to succeed. If the costs of production in a particular region, or state, become less competitive than readily available alternatives, a manufacturer might need to relocate production to lower cost states or countries. Energy costs certainly can be a driving factor in this regard.

Further, if a manufacturer with multiple production facilities decides to expand production, there will be a clear preference for expanding activity in the facilities

with the lower production cost. Those locations within the United States with lower production cost are the more likely beneficiaries of any shift in location.

Q. HOW WOULD YOU DESCRIBE THE REGIONAL ENVIRONMENT IN TERMS OF COMPETITION FOR MANUFACTURING?

A. There is significant competition for manufacturing investment and jobs from surrounding states. Many industrial customers have production facilities in other states in the region. Since labor flows easily between states, labor differentials will be smaller and energy costs are even more likely to be a factor in domestic location decisions.

With regard to local competition, what matters are the rates charged by electric utilities in similarly situated locations. In the case of Georgia, the most natural comparables would be the rates charged in other Southeastern states including Alabama, North Carolina, South Carolina and Tennessee. To the extent the cost of electricity in Georgia is greater than in neighboring states, it acts as a disincentive to invest and create jobs in the state.

The importance of energy costs for regional locations decisions has long been recognized by economic developers. While incentives are sometimes employed to attract new enterprises, they are less likely to be used to retain existing enterprises. Thus, recognizing the role of base energy prices in the competitive position of existing enterprises is important for retaining, and encouraging the expansion of, existing industry. In a very real sense, Georgia competes with its closest neighboring states to retain and expand industry and manufacturing and the myriad of benefits they bring to the economy and well-being of all Georgia citizens.

That energy costs affect location decisions for goods producing industries was recognized by the Special Council on Tax Reform and Fairness for Georgians on which I served in 2010. The council acknowledged its importance, and the uniqueness of the challenge faced by manufacturing and agricultural businesses, in recommending that energy used in manufacturing be exempted from sales taxes. While that recommendation was translated into policy, the removal of the sales tax from energy only reduced an existing competitive disadvantage faced by Georgia producers.

Q. ARE INDUSTRIAL AND OTHER CUSTOMER CLASSES EQUALLY IMPACTED BY HIGHER ELECTRICITY RATES?

A. No. In general, while higher electricity rates will increase the cost of production for industrial customers or other customer classes, the magnitude of that effect will vary across sectors of the economy and across businesses within each sector. For reasons upon which I will further elaborate, the impact of higher electric rates on manufacturers is more adverse than other customer classes.

Q. WHAT FACTORS DETERMINE THE MAGNITUDE OF THE EFFECT OF HIGHER ELECTRICITY RATES ON BUSINESSES?

A. Higher electricity rates will impact all businesses primarily through changing their cost structure. The magnitude of the effect of an increase in electricity rates on the cost structure is determined by the proportion of the business's operating cost that is represented by the cost of electricity as well as their ability to substitute among energy sources. For most industrial customers, energy and labor are generally recognized as the two largest costs for conversion of raw materials into final products. For some industrial customers, energy is the largest cost of conversion.

Equally important is the effect of a rate increase on the competitive environment in which the customers operate. Specifically, if an increase in electricity rates leads to a comparable increase in production cost for all competitors in a market area, then the effect on the competitive position of a single business is mitigated. If a customer's competitors are in areas not subject to the rate increase, then an increase in costs associated with a rate increase will diminish the customer's competitive position. These competitors can be global or regional.

Q. PLEASE ELABORATE ON THE ISSUE OF REGIONAL COMPETITION.

A. Manufacturers generally will invest capital in locations where they can achieve the lowest costs of production. This is particularly the case for manufacturers that operate in several states within a region. As noted above, a manufacturer's decision as to where to place, consolidate, or curtail production can be significantly influenced by the cost of energy.

Q. HOW DO INDUSTRIAL AND OTHER CUSTOMERS COMPARE IN THIS REGARD?

A. One of the challenges facing industrial customers, and one which differentiates their class from other classes of customers, is that they face competition regionally, nationally and globally rather than just locally. Thus, many of the industrial customers' competitors will not be subject to the same increase in electricity rates and resultant increase in production costs. As such, when an industrial customer receives a rate increase, it will hurt their competitive position versus its competitors who are operating outside the regulated area.

It is understood that no business would welcome a rate increase. However, a rate increase generally has less effect on electricity customer who compete only locally because their competitors are likely to be subject to the same increase.

Many industrial businesses have broad geographic markets and multiple production facilities. These production facilities within a company compete among themselves in the sense of having production levels varied in response to cost considerations, including the cost of electricity. They also compete for new investment on the basis of production costs.

Thus, an increase in electricity rates would likely have a greater impact on production, facility location and investment for expansion decisions of industrial class customers than for business that compete only locally. Thus, the outcome of these decisions impact job retention and job creation.

Further, the importance of initially selecting or remaining in a specific geographic location, and hence being subject to a specific utility rate structure, is not the same for all customer classes. Specifically, for businesses who compete only locally, close proximity to their customers and the cost of real estate drive location decisions more than the cost of electricity.

For example, for these businesses, being located in close geographic proximity to their customers is the crucial consideration. Since customers tend to patronize commercial businesses that are close to their residence or employment, the business location is a determinant of the relevant customer market. For manufacturers, however, the decision as to where to locate or expand a production facility is most likely based on the cost of production, of which energy cost is a substantial component.

Businesses that depend on geographic proximity to customers will be less likely to reduce or cease operations in response to an increase in their electricity rates. As has been evident by the regional and international migration of manufacturing firms in past decades, the manufacturing sector has demonstrated the ability to relocate in response to changes in the cost of production.

III. THE ECONOMIC ENVIRONMENT SINCE 2019

Q. DR. TUTTEROW, YOU LAST TESTIFIED BEFORE THIS COMMISSION IN 2019, CORRECT?

A. That is correct. I testified in the last Georgia Power rate case in November 2019.

Q. AND YOUR TESTIMONY AT THAT TIME, LIKE NOW, SUPPORTED THE IMPORTANCE OF MANUFACTURING AND DEMONSTRATED THE UNIQUE CHARACTERISTICS OF THE MANUFACTURING CLASS OF CUSTOMERS?

A. Yes.

Q. HAVE THERE BEEN ANY ECONOMIC DEVELOPMENTS SINCE 2019 THAT YOU BELIEVE TO BE RELEVANT TO THE COMMISSION'S CONSIDERATION IN THIS CASE?

A. Yes. When I testified in 2019, the national economy had been expanding for over ten years, the longest economic expansion since the end of the second World War. However, there were some indications that the pace of economic growth was slowing. Indeed, increases in the value of the U.S. dollar against the currencies of major trading partners was adversely affecting the trade sector. The strong dollar

was making U.S. exports more expensive on foreign markets. That effect is most pronounced in the manufacturing sector.

In early 2020, climate was disrupted by the Covid-19 pandemic. Both mandatory and voluntary changes in corporate and household behaviors sent the economy into a brief, but steep, recession. As measured by Gross Domestic Product, economic output fell at an 18.2% annual rate in the first half of 2020. For the two months of March and April 2020, industrial production fell by 16.5% while non-farm employment dropped by 14.4%.

The economy began recovering in May 2020. Output, as measured by gross domestic product, surpassed its pre-pandemic peak during 2nd Quarter of 2021. Industrial production surpassed its pre-pandemic high in November 2021. Non-farm payroll finally surpassed its pre-recession high in August 2022.

While surpassing pre-pandemic peaks is certainly commendable, it is also worth noting that economic activity has been slowing in recent quarters. Industrial production has decreased modestly in three of the past five quarters. Further, the Institute of Supply Management's monthly PMI (Purchasing Manager's Index) index has fallen to 50.9 as of September 2022. This index was above 60 for most of 2021. As 50 is the threshold between expansion and contraction in the manufacturing sector, the PMI is signaling that the manufacturing sector is coming under pressure of late.

Finally, inflation pressures are pervasive through the economy. While it is common to think of inflation in terms of the prices that consumers pay, it is also manifest as an increase in the prices of inputs used in producing goods. When these higher input prices are combined with upward pressure on wages, it is clear that many businesses will face challenges maintaining profit margins. Of course, in the case of

manufacturing, the cost of energy is also an important cost of producing final products.

Q. ARE THERE REASONS TO BE OPTIMISTIC ABOUT THE STATE'S FUTURE?

A. Yes, looking forward, I am optimistic about the Georgia economy and believe manufacturing can play a key role in its future performance. Competitive energy rates will play an important role in where that production locates. Georgia also remains committed to recruiting new corporate residents and retaining those already here. Energy cost will be important for those decisions as well. Further, infrastructure investments, including enhancements to the transportation system, such as the deepening of the port in Savannah, should also support further growth.

IV. THE ROLE OF THE COMMISSION

Q. WHAT ROLE DOES THE COMMISSION PLAY IN TERMS OF ENHANCING GEORGIA AS A COMPETITIVE STATE FOR MANUFACTURING INVESTMENT?

A. The Commission plays a very important role. The rates and terms under which manufacturers receive electric service are regulated by this Commission. The financial impacts of this Commission's decision are clear. As described in other parts of my testimony, the rates and terms of service for energy service have a direct impact on the competitiveness of manufacturers and the economic decisions they make.

Q. HOW IMPORTANT IS THE COMMISSION'S DECISION IN THIS CASE FROM THE PERSPECTIVE OF INDUSTRIAL CUSTOMERS?

A. It is very important. I know that GAM appreciates the pro-business decisions this Commission has made in the past. To the degree that they support employment growth, the decisions benefit all Georgians, not only business entities. I encourage the Commission to adopt an order that is consistent with the policies of growth and enhancing manufacturing in the state of Georgia. We remain in challenging economic times and many manufacturers are facing uncertain futures. In my judgment, this is an important window in which to make decisions that will aggressively improve the competitive position of manufacturers from an energy cost perspective. That is a role that this Commission can play in making Georgia a competitive state for manufacturing investment.

Q DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes.