

**COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION**

In the Matter:	:	
	:	
THE ELECTRONIC APPLICATION OF EAST KENTUCKY	:	
POWER COOPERATIVE, INC. FOR A GENERAL	:	Case No. 2021-00103
ADJUSTMENT OF RATES APPROVAL OF	:	
DEPRECIATION STUDY AMORTIZATION OF CERTAIN	:	
REGULATORY ASSETS AND OTHER GENERAL RELIEF	:	

**DIRECT TESTIMONY AND
EXHIBITS
OF
BARRY J. KORNSTEIN**

**ON BEHALF OF
NUCOR STEEL GALLATIN, LLC**

June 29, 2021

1 **Q. PLEASE STATE YOUR NAME, OCCUPATION, AND BUSINESS ADDRESS.**

2 **A.** My name is Barry J. Kornstein. I am a self-employed Economic Development Data
3 Research Consultant. My current business address is 1365 S. 1st St., Louisville, KY 40208.

4
5 **Q. PLEASE DESCRIBE YOUR EDUCATIONAL AND PROFESSIONAL**
6 **BACKGROUND.**

7 **A.** I graduated from the Massachusetts Institute of Technology in 1984 with Bachelor of
8 Science degrees in Mathematics (Applied) and Humanities (Literature). In 1986, I received
9 a Masters of International Studies from Claremont Graduate University. I was a Ph.D.
10 candidate in Political Science through the University of Minnesota-Twin Cities. For 23
11 years, I worked as a Research Manager focusing on economic impact analysis at the
12 University of Louisville. I assumed my current position in 2016.

13
14 **Q. ON WHOSE BEHALF ARE YOU TESTIFYING IN THIS PROCEEDING?**

15 **A.** I am testifying on behalf of Nucor Steel Gallatin, LLC (“Nucor”), whose generation and
16 transmission service is provided by East Kentucky Power Cooperative (“EKPC” or
17 “Company”).

18
19 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?**

20 **A.** I am sponsoring a report that I have prepared on the local, regional, and statewide economic
21 and fiscal impacts of the Nucor plant located in Gallatin County, Kentucky. That report is
22 attached as Exhibit BJK-2.

1 **Q. WOULD YOU PLEASE SUMMARIZE THE FINDINGS OF YOUR REPORT?**

2 **A.** Yes. My report concludes that the Kentucky statewide economic impacts from the existing
3 Nucor plant, the galvanizing expansion, and the new expansion will be: 1) 642 direct
4 employees with total annual labor income of \$75.5 million; 2) 3,317 direct, indirect and
5 induced jobs with total annual labor income of \$250 million; 3) total annual value added
6 (Kentucky gross domestic product) of \$752.2 million; and 4) annual state government
7 revenue of \$15.6 million. In addition, there will be significant short-term economic gains
8 during construction and because of capital equipment purchases.

9

10 **Q. DOES THIS CONCLUDE YOUR TESTIMONY?**

11 **A.** Yes.

COMMONWEALTH OF KENTUCKY
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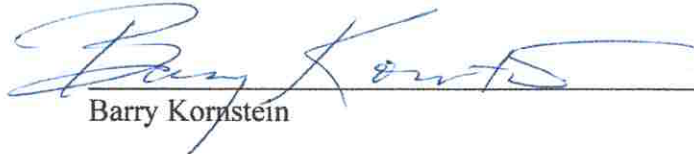
THE ELECTRONIC APPLICATION OF EAST KENTUCKY
POWER COOPERATIVE, INC. FOR A GENERAL
ADJUSTMENT OF RATES APPROVAL OF
DEPRECIATION STUDY AMORTIZATION OF CERTAIN
REGULATORY ASSETS AND OTHER GENERAL RELIEF

Case No. 2021-00103

AFFIDAVIT

STATE OF Kentucky)
COUNTY OF Jefferson)

Barry Kornstein, being duly sworn, deposes and states: that the attached is his sworn testimony and that the statements contained are true and correct to the best of his knowledge, information and belief.


Barry Kornstein

Subscribed and sworn to or affirmed before me
this 22 day of June, 2021.

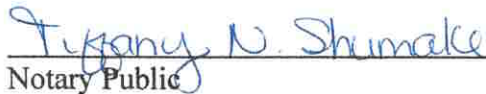

Notary Public



EXHIBIT 1

VITA

Barry Jay Kornstein

1365 South 1st St., Louisville, KY 40208 (502) 601-1534

bjkorn01@gmail.com

Education:

Ph.D. candidate in Political Science, 1990, University of Minnesota, Minneapolis, MN. Major areas of study: International Relations, Political Economy, Statistical Methodology, Game Theory, Rational Choice Models.

Master of International Studies, 1986, Claremont Graduate School, Claremont, CA. Major areas of study: International Relations, Statistical Methodology, Public Policy Analysis.

Bachelors of Science (two concurrent), 1984, Massachusetts Institute of Technology, Cambridge, MA. Majors: Mathematics (Applied), Humanities & Science (Literature).

Professional Experience:

Independent Consultant, April 2016 to Present.

Research Manager, Urban Studies Institute, University of Louisville, August 2012 to March 2016.

Research Manager, Department of Economics, College of Business, University of Louisville, April 2010 to August 2012.

Senior Research Analyst, Department of Economics, College of Business, University of Louisville, May 1998 to April 2010.

Research Associate II, Department of Economics, College of Business, University of Louisville, April 1993 to May 1998.

Computer Lab Advisor, Department of Political Science, University of Minnesota, September 1987 to August 1990.

Graduate Research Assistant, Department of Political Science, University of Minnesota, January 1989 to June 1989.

Graduate Research Assistant, Department of Political Science, University of Minnesota, April 1988 to June 1988.

Public Policy Clinic member, Claremont Graduate School, January 1986 to May 1986.

Teaching Experience:

Econometrics, Department of Economics, University of Louisville, Spring semester 1997.

Fundamental of American Government, Department of Political Science, University of Louisville, Spring semester 1994.

The Politics of Global Economic Relations, Department of Political Science, University of Louisville, Summer term 1992.

International Relations, Department of Political Science, Gustavus Adolphus College, Spring semester 1991.

Professional Presentations & Panel Participation:

“Metropolitan Clusters: How Many Market Types are There?”, North American Regional Science Association, Philadelphia, PA, November 2003.

“Methodological Issues in Macro Political Analysis”, panel discussant, American Political Science Association, Atlanta, GA, September 1989.

Professional Awards:

“1995 Macro Performance Indicators” (co-author), First Place Winner, Research Publication Category, American Council of Economic Development, 1997.

Contract Research Reports (public, additional reports are private or unreleased by sponsor)

“The Regional Economic Importance of Energy Production and Distribution by the Louisville Gas and Electric, Kentucky Utilities, and Old Dominion Companies,” for LG&E/KU, May 2020, 41 pages. Co-author, with Paul Coomes.

“The Estimated Economic & Fiscal Impact of Tourism at Kentucky Lincoln Heritage Trail Sites on Their Communities and the State,” for Kentucky Lincoln Heritage Trail, May 2020, 21 pages.

“The Estimated Local, Regional, and Statewide Economic and Fiscal Impacts of the Nucor Steel Brandenburg Plate Mill, Meade County, Kentucky,” for Boehm, Kurtz & Lowry (Cincinnati, OH) supporting document and testimony for Public Utility Commission of Kentucky case, October 2019, 14 pages.

“The Estimated Local, Regional, and Statewide Economic and Fiscal Impacts of an Expansion of the North Star Bluescope Plant, Fulton County, Ohio,” for Boehm, Kurtz & Lowry (Cincinnati, OH) supporting document and testimony for Public Utility Commission of Ohio case, March 2019, 18 pages.

“The Economic and Fiscal Impacts of the Distilling Industry in Kentucky,” for Kentucky Distillers Association, January 2019, 64 pages. Co-author, with Paul Coomes.

“The Differential Economic Importance of Industries in Kentucky and the LG&E Service Area and Its Relation to Electricity Usage,” for Boehm, Kurtz & Lowry (Cincinnati, OH) supporting document and testimony for Public Utility Commission of Kentucky case, January 2019, 11 pages.

“The Differential Economic Importance of Industries in Kentucky and the Kentucky Utilities Service Area and Its Relation to Electricity Usage,” for Boehm, Kurtz & Lowry (Cincinnati, OH) supporting document and testimony for Public Utility Commission of Kentucky case, January 2019, 12 pages.

“The Estimated Economic & Fiscal Impact of Tourism at Kentucky’s Civil War Historic Sites on Their Communities and the State,” for Kentucky Civil War Sites Association, April 2018, 10 pages.

“The Estimated Economic & Fiscal Impact on the Louisville MSA from Adding Five Thousand High Wage Jobs in Greater Louisville Inc.’s Target Business Sectors,” for Greater Louisville Inc., March 2018, 13 pages.

“The Estimated Local and Statewide Economic and Fiscal Impacts of the AK Steel Middletown Works Plant, Butler County, Ohio,” for Boehm, Kurtz & Lowry (Cincinnati, OH) supporting document and testimony for Public Utility Commission of Ohio case, October 2017, 15 pages.

“The Differential Economic Importance of Industries in Kentucky and the Southeastern Part of the State and Its Relation to Electricity Usage,” for Boehm, Kurtz & Lowry (Cincinnati, OH) supporting document and testimony for Public Utility Commission of Kentucky case, October 2017, 12 pages.

“The Estimated Local and Statewide Economic and Fiscal Impacts of Acero Junction Steel Works, LLC, Mingo Junction, Ohio, Plant,” for Boehm, Kurtz & Lowry (Cincinnati, OH) supporting document and testimony for Public Utility Commission of Ohio case, March 2017, 16 pages.

“The Economic and Fiscal Impacts of the Distilling Industry in Kentucky,” for Kentucky Distillers Association, January 2017, 40 pages. Secondary author, with Janet Kelly and Ryan Marshall.

“The Estimated Economic and Fiscal Impacts of Globe Metallurgical Inc.’s Beverly, Ohio Plant,” for Vorys, Sater, Seymour and Pease LLP (Columbus, OH) supporting document and testimony for Public Utility Commission of Ohio case, September 2016, 14 pages.

Constructed Excel and IMPLAN based economic and fiscal impact simulation models for both Louisville Forward (the economic development agency of Louisville Metro government) and Commerce Lexington (the Lexington area Chamber of Commerce). Development ongoing through much of 2015, with models completed in June, September, and December 2015.

“Louisville Affordable Housing Trust Fund: Economic Impact,” for Louisville Affordable Housing Trust Fund, August 2015, 42 pages, Secondary author, with Janet Kelly, Bridget Kelley, and Kelli Woodard.

“The Economic Impact of the Automotive Industry in Kentucky,” for Kentucky Automotive Industry Association, June 2015, 103 pages. Lead author, with Janet Kelly, Joe Slaughter, and Jay Lockett.

“Economic Impacts of Medicaid Expansion,” for Kentucky Cabinet for Health and Family Services, January 2015, 14 pages. Co-author, with Janet Kelly.

“The Economic and Fiscal Impacts of the Distilling Industry in Kentucky,” for Kentucky Distillers Association and Kentucky Agricultural Development Fund, October 2014, 67 pages. Lead author, with Jay Lockett.

“An Economic Impact Analysis of the Kentucky Center for the Performing Arts,” for Kentucky Center for the Performing Arts, June 2014, 48 pages. Lead author, with Bridget Kelley and Stacey Reason.

“The Economic and Fiscal Impacts of the Distilling Industry in Jefferson County”, for the Kentucky Distillers Association, September 2013, 26 pages. Lead author, with Janet Kelly.

“Human Capital Scorecard”, for Kentuckiana Works, August 2013, 27 pages.

“Economic Impacts of Medicaid Expansion,” for Kentucky Cabinet for Health and Family Services, April 2013, 14 pages. Co-author, with Janet Kelly.

“Kentuckiana Occupational Outlook: Projected Occupational Growth, 2010-20”, for Kentuckiana Works, January 2013, 10 pages.

“Destination Louisville: Economic and Community Impacts of Tourism,” for Louisville Convention and Visitors Bureau, November 2012, 34 pages. Lead author, with Pratiksha Bhattarai, Sarah Ehresman, and Janet Kelly.

“The Fourth Street Live! Entertainment District: Public Costs and Public Benefits,” for Louisville Metro Government and Louisville Convention and Visitors Bureau, July 2012, 25 pages. Secondary author, with Paul Coomes and Shaheer Burney.

“The Economic Importance of Military Activity in Kentucky: 2012 Update”, for The Kentucky Commission on Military Affairs, June 2012, 28 pages. Secondary author, with Paul Coomes and Shaheer Burney.

“Human Capital Scorecard”, for Kentuckiana Works, February 2012, 18 pages.

“The Economic and Fiscal Impacts of the Distilling Industry in Kentucky”, for the Kentucky Distillers Association, January 2012, 44 pages. Co-author, with Paul Coomes.

“Kentuckiana Occupational Outlook: Projected Occupational Growth, 2008-18”, for Kentuckiana Works, June 2010, 10 pages.

- “The Regional Economic and Fiscal Impacts of Changing Missions at Fort Knox, Kentucky,” for Lincoln Trail Area Development District, January 2010, 34 pages. Secondary author with Paul Coomes and Raj Narang.
- “The Economic and Fiscal Impacts of the Distilling Industry in Kentucky”, for the Kentucky Distillers Association, December 2009, 34 pages. Co-author, with Paul Coomes.
- “Human Capital Scorecard”, for Kentuckiana Works, October 2009, 10 pages.
- “North American Residential Water Usage Trends Since 1992, for the Water Research Foundation and the U.S. Environmental Protection Agency, September 2009, 161 pages. Co-author, with Paul Coomes, Tom Rockaway, and Josh Rivard.
- “Forecasts of Water Use for the Louisville Water Company, including residential forecasts for 25-county economic area”, for the Louisville Water Company, June 2009, 27 pages. Co-author, with Paul Coomes.
- “The Economic and Fiscal Impact of Events at the Kentucky Horse Park, Fiscal Year 2007”, for the Kentucky Horse Park, June 2008, 13 pages. Lead author, with Paul Coomes.
- “Kentuckiana Occupational Outlook: Projected Occupational Growth, 2006-16”, for Kentuckiana Works, May 2008, 10 pages.
- “The Economic Importance of Hospitals in Kentucky”, for the Kentucky Hospital Association, November 2007, 7 pages. Co-author, with Paul Coomes.
- “The Individual, Regional and State Economic Impacts of Kentucky Community and Technical Colleges”, for the Kentucky Community and Technical College System (KCTCS), October 2007, 90 pages. Co-author, joint project with the University of Kentucky Center for Business and Economic Research.
- “The Economic Importance of Arts and Cultural Attractions in the Louisville Area”, for the Arts and Cultural Attractions Council & Greater Louisville, Inc., October 2007, 44 pages. Co-author, with Paul Coomes.
- “The Impact of Higher Education on the Expected Work-Life Earnings of Kentucky Workers”, for the Kentucky Community and Technical College System, September 2007, 17 pages.
- “The Economic Impact of Events in 2005 at the Kentucky Fair & Exposition Center and the Kentucky International Convention Center”, for the Kentucky State Fair Board, April 2006, 20 pages. Lead author, with Paul Coomes.
- “Manufacturing in Louisville and Its Peer Metropolitan Areas: Results from the 2002 Economic Census”, for Greater Louisville, Inc., February 2006, 19 pages.
- “The Economic Importance of The Kentucky Center, 2000-2004”, for The Kentucky Center, September 2005, 18 pages.
- “Kentucky’s Economic Competitiveness: A Call for Modernization of the State’s Fiscal Policies”, for Tri-County Economic Development Foundation in Northern Kentucky, the Lexington Urban-County Government, and Greater Louisville Inc., December 2004, 77 pages. Co-author, with Paul Coomes.
- “An Economic Analysis of Millet to Matisse: Exhibition at the Speed Art Museum”, for Speed Art Museum, January 2004, 16 pages.
- “The Economic Importance of Military Activity in Kentucky”, for The Kentucky Commission on Military Affairs, January 2004, 32 pages. Secondary author, with Paul Coomes and Raj Narang.

“Logistics and Distribution Activity in the Louisville Economy”, for Greater Louisville, Inc., September 2003, 6 pages. Secondary author, with Paul Coomes.

“The Impact of Higher Education on the Expected Work-Life Earnings of Louisville Area Workers”, for Kentuckiana Works, July 2003, 12 pages.

“Transportation Financing Issues in Louisville and Jefferson County”, for the Transit Authority of River City, April 2003, 20 pages. Co-author, with Paul Coomes.

“The Economic Impact of Events in 2001 at the Kentucky Fair & Exposition Center and the Kentucky International Convention Center”, for the Kentucky State Fair Board, January 2002, 20 pages. Lead author, with Paul Coomes.

“Macro Performance Indicators for the Louisville Area Economy, 2000”, sponsored by National City, March 2001, 66 pages. Secondary author, with Paul Coomes.

“An Economic Analysis of Rembrandt to Gainsborough: Exhibition at the Speed Art Museum”, for Speed Art Museum, February 2001, 16 pages. Lead author, with Paul Coomes.

“Louisville Economic Area County Profiles”, for Greater Louisville, Inc. and Louisville/Jefferson County Workforce Investment Board, August 2000, approx. 300 pages.

“The Intrastate Distribution of State Government Revenues and Expenditures in Kentucky, Fiscal Year 1996-97”, August 1999, 18 pages. Co-author, with Paul Coomes.

“The Economic and Fiscal Impact of the 1998 Breeders’ Cup Races in Louisville, Kentucky”, for Churchill Downs, Inc. and Breeders’ Cup Lmted., July 1999, 18 pages. Secondary author, with Paul Coomes.

“Patronage by Residence for the Ohio River Riverboat Casinos”, for Churchill Downs, Inc., July 1999, 7 pages. Lead author, with Paul Coomes.

“The Economic Impact of 1997 Events at the Kentucky Fair and Exposition Center and Commonwealth Convention Center”, for the Kentucky State Fair Board, January 1998, 22 pages. Lead author, with Paul Coomes.

“The Economic and Fiscal Impact of the Louisville Medical Center”, for Jewish Hospital, October 1996, 23 pages. Secondary author, with Paul Coomes.

“Agribusiness in the Louisville Area Economy”, for Louisville Area Chamber of Commerce and Kentucky Department of Agriculture, May 1996, 67 pages. Secondary author, with Paul Coomes and John Merchant.

“1995 Macro Performance Indicators”, sponsored by National City, March 1996, 75 pages. Secondary author, with Paul Coomes.

Supportive data manipulation, analysis, and presentation for numerous other studies, reports, and projects from 1993 through to the present.

EXHIBIT 2

The Estimated Local, Regional, and Statewide Economic and Fiscal Impacts of the Nucor Steel Gallatin Plant, Gallatin County, Kentucky

by
Barry J. Kornstein
Consulting Economic Researcher

June 29, 2021

EXECUTIVE SUMMARY

Nucor Corp. (Nucor) operates an advanced technology sheet steel plate manufacturing mill in Gallatin County, which is located along the Ohio River just east of Carrollton, Kentucky. Nucor Steel Gallatin is one of the largest employers among the Ohio River counties between Louisville and Cincinnati, on either side of the river. It has a capacity of well over a million tons of sheet steel per year and has recently undergone two significant expansions. A new galvanizing facility is the first of its kind in North America, coupling a pickle line directly with a galvanizing line. And by the end of 2021, an additional 1.4 million tons of melting capacity will be added to this mill. Full-time positions at Nucor Gallatin pay an average annual wage around \$95,000 plus a full benefits package and include equipment operators, production specialists, safety and environmental technicians, engineers, and office support staff. The supply chain of Nucor Gallatin is extensive and roughly a third of the value is spent in Kentucky. About 95 percent of that goes to vendors located in the sixteen counties in the triangular area bounded by the Ohio River to the north, I-64 to the south and I-75 to the east. The purpose of this report is to document and communicate the regional and statewide economic and fiscal importance of the Nucor Steel Gallatin plant to Gallatin County, the surrounding region, and the Commonwealth of Kentucky.

The analysis in this report is based on data provided by Nucor describing its spending on various production inputs and the expected volume and value of production output for the pre-existing facility, the new galvanizing facility, and the further large expansion when it is fully operational. The Nucor Gallatin plant employs 513 people, with gross compensation of \$60.9 million (wages plus benefits). The galvanizing facility employs an additional 59 people, with compensation of \$6.5 million. The latest expansion, doubling the melting capacity, will employ 70 people with compensation of \$8.1 million. The value of Nucor Gallatin's output of plate steel is about \$960 million annually and is expected to double when the expansion is fully operational in 2022. We also analyze the economic and fiscal impacts resulting from the construction of the expansion, which has a budget of \$690 million, divided between \$200 million in direct construction costs and \$490

million for capital equipment purchases. The analysis utilizes IMPLAN, a detailed input-output model that is itself largely based on detailed U.S. government national and regional economic statistics.

Nucor Gallatin provided county of residence data for the pre-existing plant and the galvanizing facility. The commuting patterns of Kentucky residing employees for the pre-existing plant and the galvanizing facility are remarkably consistent. In each case 97 percent of Kentucky commuters reside in one of the 16 counties making up the I-64 - Ohio River - I-75 triangle.

Nucor Steel Gallatin also provided extensive accounting data on all of their vendor purchases from April 2020 through March 2021, including state and zip code information for each purchase order. Overall, roughly a third of plant spending goes to Kentucky vendors, with a bit more than 95 percent of that staying within the 16-county area.

The IMPLAN model for the 16-county area needed to be customized to make sure the industry spending patterns, including how much was purchased within the 16-county area, matched the actual company accounting data as much as possible, at least for all of the major spending categories (such as scrap metal, alloys, fluxes, electrodes, freight, outside processing, electricity, industrial gases, refractories, and waste removal). Additionally, each of the analyses was divided into two parts, first, because the commuting pattern associated with the plant is different from the default in IMPLAN, and, second, because steel plants require some very expensive inputs that are purchased in bulk from specific suppliers located in specific places. For these reasons, I modeled the household spending of the employees in the areas they are expected to reside in. I also modeled the unique industry spending patterns of the plant separately.

Based on this, it is my opinion to a reasonable degree of economic certainty that the pre-existing sheet steel plant's total net annual economic impact in Kentucky is approximately 1,950 jobs and \$153 million in labor income (which includes wages and proprietor income plus benefits). Impacted businesses would have annual output (sales) totaling \$1.36 billion and annual value added of \$380 million (including the Gallatin plant itself). When discussing economic development, value added is a more relevant measure than output, which is just a summation of all sales. Value added includes just the portion of the value of a firm's sales that is due to the work performed by the firm, stripping out the cost of intermediate goods and services. It eliminates the double counting that occurs with output when supplier firms are included with their customers among impacted businesses. For this reason, state GDP is the sum of all the value added at each of a state's businesses rather than their sales. In other words, GDP represents the total value of all

the economic activity in a given geography, a direct indication of the health and growth of the economy.

Of the statewide impact, about 97 percent is concentrated in the 16-county triangle area. Further, it is my opinion to a reasonable degree of economic certainty that, due to the operations of the pre-existing Nucor Gallatin plant and the business-to-business spending and household income it supports, state and local governments in Kentucky receive about \$12 million in payroll associated tax revenues (income, sales, and occupational taxes) annually.

Similarly, it is my opinion to a reasonable degree of economic certainty that the galvanizing facility expansion's total net annual economic impact in Kentucky is approximately 170 jobs and \$13.7 million in labor income (which includes wages and proprietor income plus benefits). Impacted businesses have annual output (sales) totaling \$76 million and annual value added of \$24 million (including the galvanizing facility itself). Roughly 97 percent is concentrated in the 16-county triangle area. Further, it is my opinion to a reasonable degree of economic certainty that, due to the operations of the galvanizing facility and the business-to-business spending and household income it supports, state and local governments in Kentucky receive about \$1 million in payroll associated tax revenues (income, sales, and occupational taxes) annually.

It is my opinion to a reasonable degree of economic certainty that the current ongoing expansion to double the plant's melting capacity will result in a total net annual economic impact in Kentucky of approximately 1,200 jobs and \$82.8 million in labor income (which includes wages and proprietor income plus benefits). Impacted businesses have annual output (sales) totaling \$1.2 billion and annual value added of \$347 million (including the galvanizing facility itself). Roughly 97 percent will be concentrated in the 16-county triangle area. Further, it is my opinion to a reasonable degree of economic certainty that, due to the operations of the plant expansion and the business-to-business spending and household income it supports, state and local governments in Kentucky will receive about \$6.8 million in payroll associated tax revenues (income, sales, and occupational taxes) annually.

The construction and equipping of the new expansion facilities also has had a short-term impact on the regional economy, boosting jobs and revenues for over the last few years. The results here are a bit more uncertain, since the exact number of contractors that worked on the project, where they reside, and how much they were paid is only known approximately from the accounting data provided by Nucor Steel Gallatin. However, adjusting the IMPLAN construction industry according to the information provided, I

estimate that Kentucky saw a three-and-a-half-year boost of around 690 jobs with almost \$44 million in annual labor income just from the construction of the new plant facilities, with about 95 percent of that impact occurring in the 16-county triangle area. Equipping the new plant with machinery, computers, vehicles, furniture, and fixtures will result in a short-term increase of about 60 jobs with \$4.1 million in labor income statewide, with about 85 percent of that occurring within the 16-county area.

The above estimates are for the economic and fiscal categories most easily quantified. Although difficult to quantify, it is also my opinion that there are other, positive economic impacts related to the expansion of the plant. For example, the area real estate market is linked to the payrolls at such facilities, but it is very difficult to sort out all the factors that contribute to housing values and commercial properties. Real estate markets are impacted over decades by complex interactions among many factors, including retirements, migration, mortgages, second incomes, second careers, children, as well as any industrial changes in the marketplace. Social indicators, like unemployment and crime, are also likely related to the Nucor Gallatin plant's employment levels, as are public costs for unemployment benefits, retraining, and social services. And the finances of local school districts are linked to the Nucor Gallatin plant's operations. Nucor Gallatin pays property taxes annually, and employees pay property taxes on their homes as well.

In sum, the Kentucky state-wide economic impacts from the existing Nucor plant, the galvanizing expansion and the new expansion will be: 1) 642 direct employees with total annual labor income of \$75.5 million; 2) 3,317 direct, indirect and induced jobs with total annual labor income of \$250 million; 3) total annual value added (Kentucky gross domestic product) of \$752.2 million; and 4) annual state government revenue of \$15.6 million. In addition, there will be significant short-term economic gains during construction and because of capital equipment purchases.

In the remainder of the report, I describe the methods used in this study, and provide the detailed economic and fiscal estimates.

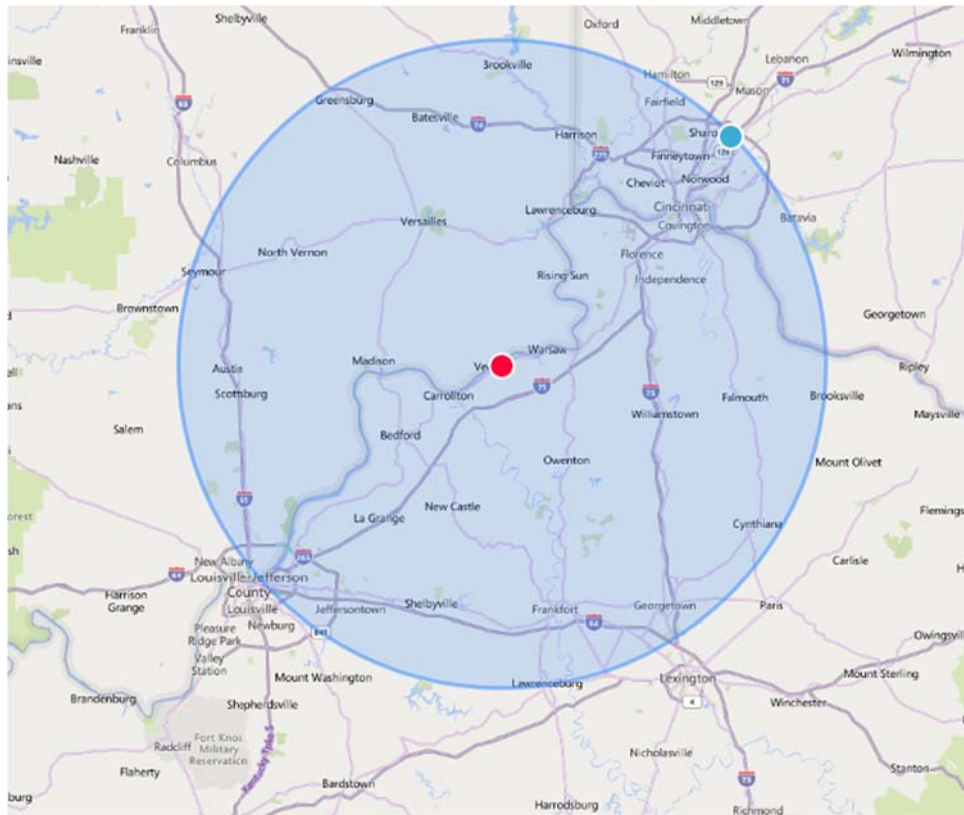
METHODOLOGY

Because the steel produced by Nucor Steel Gallatin is sold in national and international markets, it will bring new dollars into the regional and state economy – as opposed to simply absorbing local dollars, as is the case for most retail, commercial and service operations. In this sense, the operation of the Nucor Gallatin plant has large and predictable economic and fiscal impacts in Kentucky. The positive benefits of industrial manufacturers that export nationally and internationally is why multiple states other than

Kentucky aggressively pursue such large manufacturing facilities with economic development incentives.

I now turn to a discussion of the methods used to measure the regional economic and fiscal impacts. First, I explain how I defined the regional economic footprint for purposes of this impact study. Then, I discuss in some detail the input-output model used to measure the statewide impacts.

Location and Economic Footprint



The Nucor Steel Gallatin plant is located in Gallatin County, Kentucky, but close to the border of Carroll County. The map above shows a 50-mile radius centered on the plant location. Because Nucor Gallatin is a large employer requiring skilled workers, and Gallatin and Carroll counties have just 20,000 people between them, it must pull from a fairly wide commuting shed. County of residence data for the existing plant show that while 140 employees (27 percent) live in either Gallatin or Carroll county, an equal number live across the river in Indiana, and nearly half of the galvanizing facility employees live in Indiana. But we are concerned exclusively with Nucor Steel Gallatin's impact on the Kentucky economy, and the commuting patterns of Kentucky residing employees for the existing plant and the galvanizing facility are remarkably consistent. In each case 97

percent of Kentucky commuters reside in one of the 16 counties making up the I-64 - Ohio River - I-75 triangle.

Sixteen-County Triangle Area

Boone	Grant	Owen
Campbell	Henry	Scott
Carroll	Jefferson	Shelby
Fayette	Kenton	Trimble
Franklin	Oldham	Woodford
Gallatin		

Note: 97% of Kentucky employees, company purchasing, and economic impact occurs within these 16 counties.

Commuting Pattern for Nucor Gallatin Steel Plant

County of Residence	Existing Plant	Galvanizing Facility
Kentucky	357	31
16 County Triangle	348	30
Boone	90	5
Carroll	73	7
Gallatin	67	8
Trimble	36	4
Oldham	15	1
Grant	14	1
Owen	13	
Henry	12	3
Kenton	12	
Jefferson	11	1
Shelby	2	
Campbell	1	
Fayette	1	
Scott	1	
Other Kentucky	9	1
Indiana	144	28
Three Closest Counties	114	27
Switzerland	60	9
Jefferson	30	8
Ohio	24	10
Other Indiana	30	1
Other State	12	0
Total Employees	513	59

Nucor Steel Gallatin also provided extensive accounting data on all of their vendor purchases from April 2020 through March 2021, including state and zip code information for each purchase order. We have summarized that data below according to how much was spent overall, was paid to vendors located in Kentucky and to vendors located in one of the 16 triangle counties. Overall, roughly a third of plant spending goes to Kentucky vendors, with a bit more than 95 percent of that staying within the 16-county area.

Vendor Locations for Nucor Gallatin Steel Plant

	Existing Plant		Galvanizing Facility	
	Spending	% of Total	Spending	% of Total
Total Vendor Purchases	\$738,588,623		\$39,476,329	
Purchases from Vendors Located in:				
Kentucky	\$257,833,842	34.9%	\$5,834,389	14.8%
16-County Area	\$245,301,140	33.2%	\$5,787,127	14.7%
16-County Area % of Kentucky Purchases		95.1%		99.2%

Source: Analysis of accounting data provided by Nucor Steel Gallatin.

It is therefore very likely that most of the spin-off activity that stays in Kentucky resulting from both the household spending of Nucor Gallatin employees and the business-to-business spending by Nucor Gallatin will be within the 16-county triangle area. Therefore, I primarily utilize an economic model of the 16-county area to derive the overall impacts. Though the impacts are small in comparison, I also model the commuting and spending impacts in the rest of the state.

Input-Output Model of Kentucky

To evaluate the economic and fiscal impacts of the Nucor Steel Gallatin plant, I used standard regional economic impact methods. I obtained detailed economic data for each of the 120 counties of the Commonwealth of Kentucky and used them to build IMPLAN input-output models of the 16-county triangle region and the 104-county remainder of the state.¹ The model can simulate the effects of changes in economic activity for any of 546 regional industries. It also can predict detailed inter-industry purchases and household spending related to industrial changes. Such region-specific models have the advantage that they take into account those industrial supplies and retail items likely available in the region and thus provide more precise economic impact estimates than one that assumes everything is available in the region. The more that local industries can support the plant operation and the employees’ household demands, the greater the regional economic multipliers, and hence the greater the predicted regional economic impact.

¹ As best I can tell, IMPLAN is one of the most widely used regional input-output modeling systems in the world. It has been used for thousands of impact studies. It was developed by economists at the University of Minnesota, and is sold by IMPLAN, Inc. See implan.com for documentation.

The Nucor Steel Gallatin plant fits the North American Industrial Classification System (NAICS) code 331110, Iron and Steel Mills and Ferroalloy Manufacturing. The official definition is as follows:

(331110) This industry comprises establishments primarily engaged in one or more of the following: (1) direct reduction of iron ore; (2) manufacturing pig iron in molten or solid form; (3) converting pig iron into steel; (4) making steel; (5) making steel and manufacturing shapes (e.g., bar, plate, rod, sheet, strip, wire); (6) making steel and forming pipe and tube; and (7) manufacturing electrometallurgical ferroalloys. Ferroalloys add critical elements, such as silicon and manganese for carbon steel and chromium, vanadium, tungsten, titanium, and molybdenum for low- and high-alloy metals. Ferroalloys include iron-rich alloys and more pure forms of elements added during the steel manufacturing process that alter or improve the characteristics of the metal.

<https://www.census.gov/naics/?input=331110&year=2017&details=331110>

At the heart of regional input-output models are industrial production functions, which are recipes for producing the products of an industry, what is needed, and relatively how much is spent on each input. These are combined with estimates of how much of the supply needs of an industry can be provided by other regional industries. The models use federal data on the presence of industries in the local economy to predict how much of an industry's inputs can be supplied locally versus that which must be imported from other regional economies. The IMPLAN model for the 16-county area needed to be customized to make sure the industry spending patterns, including how much was purchased within the 16-county area, matched the actual company accounting data as much as possible, at least for all of the major spending categories (such as scrap metal, alloys, fluxes, electrodes, freight, outside processing, electricity, industrial gases, refractories, and waste removal).

Rather than just specifying the number of jobs in the 16-county area due to the plant operations and running a multi-region analysis in IMPLAN (which models the interactions among businesses and households in different regions, in this case the 16 counties and the rest of Kentucky), the analysis was divided into parts for two reasons. First, the commuting pattern associated with the plant is different from the default in IMPLAN. Second, steel plants require some very expensive inputs that are purchased in bulk from specific suppliers located in specific places. Getting the geographic locations and high dollar values together correctly matters. For these reasons, I modeled the household spending of the employees in the areas they are expected to reside in. I also modeled the unique industry spending pattern of the plant separately. In this way, the results below

represent a fairly accurate representation of the impacts of Nucor Steel Gallatin operations.

ECONOMIC IMPACTS

Based on that method, the IMPLAN model uses annual economic data to provide reasonable estimates of statewide effects on sales, jobs, and payrolls for export-based expansions or contractions of any of 546 industries in Kentucky. In the sections below, I summarize the results of the IMPLAN simulations I ran on the customized 16-county area model and the regional model containing the remaining 104 Kentucky counties for the impact of the existing plant, the galvanizing facility addition, and the most recent expansion to double melting capacity. A discussion of the relevant economic terms follows the first table.

Pre-Existing Nucor Steel Gallatin Plant

Estimated Kentucky Statewide Impact of Pre-Expansion Nucor Steel Gallatin Plant				
Impact Type	Employment	Labor Income	Value Added (GDP)	Output
Kentucky Statewide Totals				
Direct Effect	513	\$60,939,580	\$215,072,358	\$963,888,129
Indirect Effect	911	\$65,986,203	\$120,350,780	\$270,200,060
Induced Effect	522	\$26,536,620	\$45,980,338	\$80,269,628
Total Effect	1947	\$153,462,404	\$381,403,476	\$1,314,357,818
Implied Multiplier	3.79	2.52	1.77	1.36

Source: IMPLAN version 3.1 input-output models of 16-county area and a region consisting of the remaining 104 Kentucky counties. 2019 IMPLAN economic data. Values in 2021 dollars. Results presented are sums of all household and industry spending analyses. 97% of the indirect and induced impacts occur within the 16-county area.

For each of several impact types (Employment, Labor Income, Value Added and Output), the IMPLAN model begins with a direct effect – here, the pre-existing steel plant. The direct effect would be the 513 employees earning \$60.9 million in compensation producing \$963 million worth of sheet steel. Labor income includes fringe benefits (both privately provided, such as health insurance or retirement fund matches, and government provided, such as Social Security and Medicare payments) as well as proprietor income (e.g. self-employment and unincorporated small businesses). Value added refers to the value of the product that is not tied to the prices of the purchased inputs. It is the difference between the sales value of the steel products and the value of all the purchased inputs, so it is the additional value gained during the production process. Since an input of one industry is the output of an industry upstream in the production process,

focusing on value added avoids double counting. State level GDP, for example, is just the sum of the value added at all businesses in the state (not the sum of their output/sales). Given a Direct Effect, the IMPLAN model calculates an Indirect Effect, Induced Effect, Total Effect, and an economic Multiplier.

The Indirect Effect in the table refers to the linkages between the exporting industry (steel) and its industrial vendors (raw materials, transportation, electricity, tools, computers, insurance, etc.). When the exporting industry expands or contracts, it raises or lowers its purchases from its vendors, thus changing their employment and payrolls. Of course, the vendors also purchase goods and services from each other, so that the total indirect effect includes all the inter-industry linkages.

The Induced Effect refers to the impact of the new sales in the exporting industry (steel) on the local economy through the rounds of re-spending of the additional household income caused by the operation of the plant. Regional sales of cars, groceries, building supplies, banking services, and so on are all sensitive to growth in disposable income, as are donations to nonprofit groups, churches, and charities. The induced effect includes the household spending of all households affected directly and by the indirect linkages (the employees benefiting from the indirect effects). The Total Effect is the sum of the Direct, Indirect and Induced Effects.

The table clearly shows that the pre-existing Nucor Steel Gallatin plant has considerable impact both regionally and statewide. The table does not break out impacts within the 16-county area from the statewide totals, but roughly 97 percent of all the indirect and induced impacts from the pre-existing plant occur within the 16-county area. I estimate that the 513 jobs at the plant support an additional 1434 jobs in the state (most in the triangle area). Those jobs infuse the local economy with an additional \$92.5 million in labor income. Those additional jobs (the indirect and induced effect) are associated with approximately \$166 million in value added. Roughly 911 jobs and \$66 million of income are due to business-to-business spending, both between Nucor Gallatin and its suppliers within the 16-county area and between those suppliers themselves. An additional 522 jobs and \$26.5 million of income are due to the household spending of Nucor Gallatin employees and those households affected by the added business-to-business spending (induced effects tend to result in lower average income per job because much of the employment is in lower paying retail and personal service industries).

In sum, the pre-existing Nucor Steel Gallatin plant benefits the state of Kentucky by supporting about 1950 jobs (including the 513 jobs at the plant itself). Those jobs add

about \$153 million in labor income to state households. With the pre-existing plant and affected businesses adding around \$381 million to the state GDP.

A few things about the multiplier line in the table are worth mentioning. The IMPLAN Multipliers allow a reasonable prediction of the total statewide economic impact of a change such as the Direct Effect. For example, looking at the Employment column of the table, the estimated job multiplier for the Nucor Gallatin plant in Kentucky is 3.79, meaning that for every job at Nucor Gallatin, another 2.79 jobs are created elsewhere in Kentucky. Similarly, the multiplier for Labor Income for Kentucky in the table is 2.52, meaning that for every dollar of income created at Nucor Gallatin another \$1.52 in income is created in other Kentucky industries. The Output Multiplier for Kentucky, 1.36 as shown in the table, measures the total statewide revenues of companies divided by the direct Nucor Gallatin revenues of \$960 million. The Output Multiplier of 1.36 means that companies in Kentucky see an additional \$0.36 in sales when Nucor Gallatin sales rise by one dollar. Finally, the Value Added Multiplier estimates the sales dollars that 'stick' to Kentucky. Value added refers to the portion of total sales that is accounted for by regional companies and which stimulate the regional economy.² The Value Added Multiplier of 1.77 means that companies in Kentucky add \$0.77 in value to the Kentucky economy for every \$1 added by the Nucor Gallatin plant. The distinction between Output and Value Added is important in regional economic studies since much of what goes into the total value of a product is intermediate goods and services purchased from vendors outside the region, and thus local economic activity can affect many regions.

The employment multiplier is so large because a large volume of steel can be produced with relatively few employees (compared to other industries) and close to 80 percent of its value is in the inputs. Per employee, a steel plant is purchasing a very high value of intermediate goods and services. So, there are a lot of jobs created in industries where the value of the goods and services per employee is much less than it is for steel. This results in a high employment multiplier and much lower output multiplier. The income multiplier is significantly lower than the job multiplier because steel plant jobs pay much better than most of the jobs benefiting from their impact.

Galvanizing Facility Expansion

² For an insightful example of value added, consider the purchase of a new car at a Lexington area dealership. If a resident spent \$25,000 on a new Subaru Outback, most of the dollars would flow immediately to the manufacturer of the car, built in Indiana with top management in Japan. Only a few thousand dollars in dealer prep work and commissions would be captured in the Lexington economy. So, in economic parlance, the value of output (sales) would be \$25,000, and value added might be only \$3,000.

Estimated Kentucky Statewide Impact of Nucor Gallatin Galvanizing Facility Expansion

Impact Type	Employment	Labor Income	Value Added (GDP)	Output
Kentucky Statewide Totals				
Direct Effect	59	\$6,534,622	\$11,511,325	\$51,590,218
Indirect Effect	71	\$5,117,397	\$8,716,205	\$18,225,483
Induced Effect	41	\$2,096,641	\$3,632,372	\$6,340,972
Total Effect	172	\$13,748,660	\$23,859,902	\$76,156,672
Implied Multiplier	2.91	2.10	2.07	1.48

Source: IMPLAN version 3.1 input-output models of 16-county area and a region consisting of the remaining 104 Kentucky counties. 2019 IMPLAN economic data. Values in 2021 dollars. Results presented are sums of all household and industry spending analyses. 97% of the indirect and induced impacts occur within the 16-county area.

Again, the table does not break out impacts within the 16-county area from the statewide totals, but roughly 97 percent of all the indirect and induced impacts from the galvanizing facility expansion occur within the 16-county area. I estimate that the 59 jobs tied to this expansion support an additional 112 jobs in the state (most in the triangle area). Those jobs infuse the local economy with an additional \$7.2 million in labor income. Those additional jobs (the indirect and induced effect) are associated with approximately \$12.3 million in value added. Roughly 70 jobs and \$5.1 million of income are due to business-to-business spending, both between Nucor Gallatin and its suppliers within the 16-county area and between those suppliers themselves. An additional 41 jobs and \$2.1 million of income are due to the household spending of Nucor Gallatin employees and those households affected by the added business-to-business spending.

In sum, the galvanizing facility expansion of the Nucor Steel Gallatin plant benefits the state of Kentucky by supporting about 172 jobs (including the 59 jobs at the plant itself). Those jobs add about \$13.7 million in labor income to state households. With the galvanizing facility and affected businesses adding around \$23.9 million to the state GDP.

Current Expansion – Doubling of Melting Capacity

Estimated Kentucky Statewide Impact of Recent Nucor Gallatin Plant Expansion

Impact Type	Employment	Labor Income	Value Added (GDP)	Output
Kentucky Statewide Totals				
Direct Effect	70	\$8,050,000	\$215,050,106	\$963,788,402
Indirect Effect	816	\$58,913,740	\$104,461,349	\$236,260,051
Induced Effect	313	\$15,870,682	\$27,496,309	\$48,002,768
Total Effect	1198	\$82,834,422	\$347,007,763	\$1,248,051,221
Implied Multiplier	17.12	10.29	1.61	1.29

Source: IMPLAN version 3.1 input-output models of 16-county area and a region consisting of the remaining 104 Kentucky counties. 2019 IMPLAN economic data. Values in 2021 dollars. Results presented are sums of all household and industry spending analyses. 97% of the indirect and induced impacts occur within the 16-county area.

The table clearly shows that the most recent Nucor Steel Gallatin plant expansion will have considerable impact both regionally and statewide. The table does not break out impacts within the 16-county area from the statewide totals, but roughly 97 percent of all the indirect and induced impacts from the pre-existing plant occur within the 16-county area. Because the current expansion will double melting capacity, plant managers are expecting to double the output of sheet steel. While the expansion will require only 70 additional employees, there will be nearly double the current spending on inputs. Assuming a similar supplier network to the current situation, this includes roughly \$225 million in purchases from vendors located in the 16-county triangle area.

I estimate that the 70 jobs associated with the plant expansion will support an additional 1128 jobs in the state (most in the triangle area). Those jobs will infuse the local economy with an additional \$74.8 million in labor income. Those additional jobs (the indirect and induced effect) will be associated with approximately \$132 million in value added. Roughly 816 jobs and \$59 million of income will be due to business-to-business spending, both between Nucor Gallatin and its suppliers within the 16-county area and between those suppliers themselves. An additional 313 jobs and \$15.9 million of income will be due to the household spending of Nucor Gallatin employees and those households affected by the added business-to-business spending.

In sum, the current Nucor Steel Gallatin plant expansion will benefit the state of Kentucky by supporting about 1200 jobs (including the 70 jobs at the plant itself). Those jobs will add about \$82.8 million in labor income to state households. With the plant expansion and affected businesses adding around \$347 million to the state GDP.

Current Expansion Construction and Capital Equipment Impacts

There are short-term impacts arising from the construction and equipping of the new facilities as well. The project is budgeted for \$690 million overall. Based on detailed accounting data on purchase orders for the expansion provided by Nucor Gallatin, I estimate that this amount is divided into about \$200 million in direct construction spending and \$490 million for capital equipment purchases. Nearly all of the construction spending is expected to be done on site, while the capital equipment spending is spread nationwide. I modeled the construction and capital equipment purchases separately, with the results presented in the following tables.

The construction schedule is nearing completion and began towards the end of 2018. It seems reasonable to assume that the total construction time be will three and a half years. The model therefore divides the total spending into equal annual segments (just over \$57 million). I modified IMPLAN’s “construction of new manufacturing structures” industry so that it better fit the accounting information provided by Nucor Gallatin. The results are in the table below, with 95 percent of the indirect and induced impacts occurring within the 16-county triangle area. It is likely the expansion construction supported an additional \$41.5 million in sales (output) annually statewide, helping to employ a further 244 people in jobs with \$13.3 million of labor income (wages plus benefits). Altogether, the three-and-a-half-year construction phase temporarily boosted Kentucky employment by 687 jobs and increased incomes by \$43.8 million, 95 percent of that within the 16-county area.

**Estimated Kentucky Statewide Impact of Recent Nucor Gallatin Plant Expansion
Construction (Annual Impact for 3.5 Years)**

Impact Type	Employment	Labor Income	Value Added (GDP)	Output
Kentucky Statewide Totals				
Direct Effect	443	\$30,492,561	\$31,312,782	\$57,142,858
Indirect Effect	70	\$4,507,880	\$7,662,915	\$14,954,835
Induced Effect	174	\$8,841,563	\$15,289,862	\$26,683,024
Total Effect	687	\$43,842,004	\$54,265,559	\$98,780,718
Implied Multiplier	1.55	1.44	1.73	1.73

Source: IMPLAN version 3.1 input-output models of 16-county area and a region consisting of the remaining 104 Kentucky counties. 2019 IMPLAN economic data. Values in 2021 dollars. Results presented are sums of all household and industry spending analyses. 95% of the indirect and induced impacts occur within the 16-county area.

I modeled the \$490 million in capital equipment spending using IMPLAN’s equipment, furniture, and fixtures investment spending profile for the “iron and steel mills and manufacturing with purchased steel” industry modified to better fit the accounting data

from Nucor Gallatin. The purchase order data indicates that just \$18 million of the total capital equipment spending will go to vendors located in Kentucky. About 84 percent of that will be with vendors located in the 16-county area. The capital equipment expenditures occur in a narrower timeframe than the construction as a whole, so the results in the table reflect annual impacts over a 2.5-year period. Statewide, capital equipment spending is expected to amount to average annual sales of \$12.1 million. Altogether, capital equipment spending for the current expansion temporarily boosted Kentucky employment by 58 jobs and increased incomes by \$4.1 million, about 85 percent of that within the 16-county area.

**Estimated Kentucky Statewide Impact of Recent Nucor Gallatin Plant Expansion
Capital Equipment Investment (Annual Impact for 2.5 Years)**

Impact Type	Employment	Labor Income	Value Added (GDP)	Output
Kentucky Statewide Totals				
Direct Effect	28	\$2,364,453	\$2,998,902	\$7,179,984
Indirect Effect	15	\$950,127	\$1,355,459	\$2,544,095
Induced Effect	16	\$787,896	\$1,373,601	\$2,413,621
Total Effect	58	\$4,102,476	\$5,727,962	\$12,137,699
Implied Multiplier	2.10	1.74	1.91	1.69

Source: IMPLAN version 3.1 input-output models of 16-county area and a region consisting of the remaining 104 Kentucky counties. 2019 IMPLAN economic data. Values in 2021 dollars. Results presented are sums of all household and industry spending analyses. 85% of the indirect and induced impacts occur within the 16-county area.

Taxes and Fiscal Impacts

To reasonably estimate the fiscal impacts of an industrial expansion or contraction in a region, analysts must rely on company records and local sources of data. I turn now to a discussion of the types of taxes and how I link fiscal impacts to economic impacts. My estimates are summarized in the next table. I focus on the tax revenues that are most directly related to the payroll impacts of new jobs, income and sales taxes. These estimated tax revenues are related both to the direct Nucor Steel Gallatin wages and salaries and to the indirect and induced labor income statewide, as predicted by my IMPLAN models. I estimate that the total annual fiscal impact in Kentucky (of this limited range of taxes) is \$12.3 million for the pre-existing plant, \$1.1 million for the galvanizing facility expansion, and \$6.8 million for current capacity expansion, as summarized in the table and discussed below.

Income Generated by the Pre-Expansion Nucor Steel Gallatin Plant, the Galvanizing Facility Expansion and the Current Capacity Expansion

	State Income Tax	State Sales Tax	City/County Occupational Tax	School Occupational Tax
Annual Impact				
Pre-Expansion Nucor Steel Gallatin Plant	\$5,215,272	\$4,345,444	\$2,213,716	\$269,300
Galvanizing Facility Expansion	\$467,235	\$389,307	\$190,481	\$21,032
Current Capacity Expansion	\$2,815,048	\$2,345,541	\$1,377,359	\$217,759
Construction (Annual Impact for Three-and-a-Half Years)				
Current Capacity Expansion	\$1,489,928	\$1,241,431	\$536,023	\$38,569
Capital Equipment (Annual Impact for Two-and-a-Half Years)				
Current Capacity Expansion	\$139,419	\$116,166	\$70,412	\$11,393

Note: These estimates are derived from historical ratios of taxes collected to labor income for state taxes, and current rates for local occupational taxes, weighted by the wages within each taxing jurisdiction.

Employees pay state sales taxes when they spend their wages in the local economy, and are also liable for state income and local occupational taxes in Kentucky.

Kentucky State Sales and Income Tax

By comparing the ratio of tax receipts to regional labor income, I calculate “effective” tax rates and use those to estimate the amount of Kentucky income and sales taxes linked to the Nucor Gallatin payroll and impacts throughout the state. Labor income data by county comes from the US Bureau of Economic Analysis while the tax receipt data is compiled from multiple tax annual reports released by the Kentucky Revenue Cabinet. I used a ten-year average effective rate over the period 2009-18 (the last ten years for which all data is complete). The income tax effective rate is 3.4% and the sales tax effective rate is 2.83%.

For each of the impact analyses listed in the table, we apply the appropriate effective rates to the labor income effect based on the geography in which the income is realized (Gallatin County, the 16-county area, or the rest of the state). Calculated this way, I estimate that state government revenues attributable to the pre-existing Nucor Gallatin plant are \$5.2 million in income taxes and \$4.3 million in sales taxes. The galvanizing facility expansion supports an estimated \$470,000 in income taxes and \$390,000 in sales taxes. And the most recent expansion is expected to result in an additional \$2.8 million in state income tax collections and \$2.3 million in state sales tax collection annually.

The temporary state income and sales tax annual boosts from the construction of the current expansion is about \$1.5 million for income tax and \$1.2 million for sales tax. The

capital equipment purchases from Kentucky vendors is expected to bring in another \$139,000 in income tax and \$116,000 in sales tax, on an annual basis for 2.5 years.

Local Occupational Taxes

Note that employees of the Nucor Gallatin plant not only pay state income and sales taxes, they also pay a local occupational tax of one percent. The annual impact of these payments can be reasonably estimated, too, and are significant. Employees throughout the 16-county area and the state of Kentucky often pay local occupational tax as well.

I have taken the local government jurisdictions that levy occupational taxes in counties and cities and weighted their rates by the value of wages in each jurisdiction in that county. This gives us a weighted average local occupational tax for each county to apply to the payroll impact of the IMPLAN model. I have also created weighted averages of occupational taxes for the 16-county triangle area and for the state using payroll inside and outside taxing jurisdictions as the weight. I apply these weighted averages to the combined indirect and induced payroll impacts. I applied the same methods for school district occupational taxes.

Applying the appropriate payroll impact to the weighted local tax rates, I estimate that local school districts would receive about \$270,000 in occupational taxes, and local city or county governments would receive \$2.2 million in occupational tax revenue due to the effects of the pre-existing Nucor Steel Gallatin plant. The galvanizing facility expansion supports an estimated \$21,000 in school occupational taxes and \$190,000 in city or county government occupational taxes. And the recent capacity expansion is expected to result in an additional \$218,000 in school occupational tax revenues and almost \$1.4 million in city and county government occupational tax collections annually. About 97 percent of all those local tax revenues will go to governments within the 16-county area.

Constructing and equipping the capacity expansion will also bring short-term impacts lasting a few years. Constructing the structure will result in local jurisdictions seeing a boost of \$575,000 in occupational taxes for a few years, mostly within the 16-county area.

The capital equipment tax impact could bring a boost of about \$82,000 in occupational tax to local jurisdictions for a couple years.

Although harder to measure, additional tax impacts are also likely. Unemployment insurance taxes, insurance premiums taxes, building permit fees, motor vehicle sales taxes, and many other business tax categories are all affected by the operations of the plant. Employees also pay gasoline taxes and property taxes, and there are positive effects on the regional real estate market.

Nucor Steel Gallatin also directly pays taxes to state and local governments. They most recently paid a combined \$5.7 million in state and local property taxes, state sales tax, and state utility taxes. The effect of the current capacity expansion may come close to doubling these amounts.

Annual State and Local Property, Sales, and Utility Taxes Paid by Nucor Steel Gallatin

Property Tax (included railcars and vehicle registrations)	\$2,007,138
Sales Tax	\$1,307,498
County in Lieu Tax	\$127,605
Utility Tax - Including Util Sales Tax	\$2,317,980

Information provided by Nucor Steel Gallatin.