CONSUMER ENERGY ALLIANCE
THE VOICE OF THE ENERGY CONSUMER

2021

THE REGIONAL ECONOMIC AND FISCAL IMPACTS OF AN ENBRIDGE LINE 5 SHUTDOWN

PREPARED FOR
CONSUMER ENERGY ALLIANCE BY WEINSTEIN, CLOWER & ASSOCIATES

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EXECUTIVE SUMMARY

The following presents the findings of our analysis of the potential economic losses that would attend the closure of the Enbridge Line 5 pipeline that carries light crude oil and natural gas liquids (NGLs)—mainly propane—from northwestern Wisconsin, through the state of Michigan, and terminates in Sarnia, Ontario. The focus of the analysis is on the economic dislocations that would occur in the states of Michigan, Ohio, Indiana, and Pennsylvania, though other nearby states and Canadian provinces would also be impacted. The loss of energy commodity supply will be especially harmful for businesses and residents of the Upper Peninsula of Michigan, with Line 5 supplying 65 percent of the propane used in that part of the state and no economically viable alternative sources in place. Critically, refineries and petrochemical plants in Michigan, Ohio, and Pennsylvania will lose feedstock resources if Line 5 is shuttered, which will reverberate throughout the industrial supply chains of the region.

OUR KEY ASSUMPTIONS INCLUDE:

- The closure of Line 5 will directly impact pipeline operations and maintenance jobs in Michigan, Wisconsin and other states and provinces.

- Based on testimony offered by business and labor leaders, two refineries in the Toledo, Ohio region will likely shut down due to loss of cost-effective feedstock. In addition, other refineries in Michigan, Indiana, and Pennsylvania may see permanent reductions in market share as Line 5 product is replaced with higher cost alternatives.

- The disruption and loss of cost-effective supplies of natural gas liquids will cause production and jobs losses in the following downstream industries: plastics manufacturing; the production of anti-freeze and similar chemicals; detergents; synthetic rubber; and the refining of ethanol.

- The assessment of total economic and fiscal impacts from shutting down Line 5 presented in this study likely understates total economic losses because data and scope limitations did not allow us to quantify the following impacts:

    - Higher costs for propane and other natural gas liquids that will drive up operating costs for regional farmers.

    - Higher home heating and related costs that will increase the cost of living for households and could exacerbate existing trends of population out-migration for many Michigan and other Midwestern communities.

OUR KEY ASSUMPTIONS CONTINUED:

- We do not include the likely increase in gasoline prices or the downstream impacts of higher transportation costs as refinery inputs become more costly without Line 5.
- Our modeling does not explicitly assess potential impacts on jet fuel prices and how that increase would impact the cost of air travel for Detroit regional travelers.
- The disruption of the supply of refined petroleum products caused by the loss of feedstock could impact many critical regional industries. However, the readily available data do not allow us to explicitly model how these disruptions would affect total industry output and employment as businesses shift to higher cost inputs.
- The analysis does not consider the economic consequences that could arise from the Canadian government's reaction to a shutdown of Line 5, which would be a direct violation of a bilateral treaty in place since the Carter Administration. Such an action would give Canada grounds to take legal and trade policy actions that would affect U.S. businesses, market opportunities and jobs.
- Finally, this analysis does not include an assessment of the chilling effect on investment decisions if the precedent is established that a state governor can arbitrarily cancel an easement such as the Mackinac Strait pipeline crossing.

Even with these limitations and exclusions, the potential economic losses that would likely attend the closure of the Enbridge Line 5 are huge. Based on the modeled business disruptions described, we used the IMPLAN economic input-output model to estimate total regional and state level economic losses.

- For the four-state region (MI, OH, IN, PA) total annual economic losses of closing Line 5 are conservatively estimated at:
  - **$20.8 billion loss in economic activity.**
  - **$8.3 billion reduction in combined Gross State Product**
  - **$2.36 billion foregone labor earnings in salaries, wages and benefits.**
  - **33,755 lost jobs**
  - **$265.7 million lower annual state tax revenues.**

Table ES1 shows these impacts at the state level. While the potential losses are severe in all states, the data available at the time of this analysis clearly show that a Line 5 shutdown will actually have a greater negative impact on Ohio than on Michigan.

The Industrial Midwest has been challenged in attracting and retaining population and workers for five able decades. The six states of the Industrial Midwest (our study region plus Illinois and Wisconsin) lost more than 1.7 million people to other regions between 2010 and 2019. Part of this loss is due to a high cost of living compared to several mid-south, south, and southwestern states. Higher energy costs resulting from one governor's actions will exacerbate the loss of the Midwest's most critical industrial resource – workers.

The region has endured decades of challenges in retaining and creating good-paying jobs. With some signs of progress in restoring industrial activity in both new (computer chips and aerospace) and re-imagined traditional industries (electric and autonomous vehicles), the arbitrary action by one governor could stymie this hard-won progress. By undermining key industrial sectors and creating investor and industry uncertainty about policy priorities, the closing of Line 5 may further erode the Midwest's regional economic competitiveness.

The battle against Enbridge Line 5 is not just about a pipeline. Should Line 5 actually be shut down, not only will the region see job losses, diminished tax receipts, and higher energy costs but it's "anti-business" reputation will be reinforced. The consequence will be a continuation of the exodus of people and jobs to other parts of the country.

TABLE ES1:
ANNUAL ECONOMIC ACTIVITY UNDER THREAT AND POTENTIALLY LOST FROM AN ENBRIDGE LINE 5 SHUTDOWN

	Michigan	Ohio	Pennsylvania	Indiana
Output (economic activity)	$3,061,835,000	$13,695,807,000	$2,101,177,000	$2,061,231,000
Gross State Product	$1,021,006,000	$5,866,124,000	$733,489,000	$645,995,000
Labor Income	$464,559,000	$1,363,256,000	$331,461,000	$205,974,000
Jobs	6,692	20,422	3,853	2,788
State Tax Revenue	$56,811,000	$147,899,000	$34,444,000	$26,575,000

Sources: Authors' estimates; IMPLAN

BACKGROUND

Enbridge Line 5, constructed in 1953, is a major pipeline carrying light crude oil and natural gas liquids (NGLs)—mainly propane—from northwestern Wisconsin, through the state of Michigan, and terminating in Sarnia, Ontario (see Figure 1). It is part of a large pipeline network transporting liquid hydrocarbons from Western Canada, mainly the Province of Alberta, into the American Midwest where the product is delivered to refineries, steam crackers, and propane processors.

Though the pipeline has operated for almost 70 years with no leaks or breaks, the current governor of Michigan, Gretchen Whitmer, has ordered a shutdown of Line 5 in May of 2021. She argues that because a four-mile segment of the pipeline runs under the Straits of Mackinac between Lakes Michigan and Huron, a rupture would spill huge amounts of oil into the Great Lakes causing an economic and environmental disaster. Enbridge Energy Company has filed a lawsuit claiming the Governor doesn't have jurisdiction to stop the pipeline, while

LINE 5 PIPELINE FIGURE 1

The following illustration highlights the right-of-way that Line 5 takes across Wisconsin, Michigan, and into Sarnia, Ontario, Canada. The call-out in the bottom left hand of the illustration shows the point where the Great Lakes Tunnel Project is being proposed.

five members of the Michigan congressional delegation and Canadian Prime Minister Justin Trudeau are pressing the Biden administration to keep Line 5 operational.

Both consumer and business organizations have voiced concerns about the economic fallout should Line 5 be taken out of service because such a disruption would eliminate the flow of propane to the Upper Peninsula's Rapid River processing facility and cut off crude oil and NGL deliveries to refineries and processing facilities in Detroit, Sarnia, Toledo, and other downstream locations.

The mostly rural Upper Peninsula of Michigan would be most at risk because Line 5 supplies 65 percent of propane demand in that part of the state. Unlike built-up areas in the Lower Peninsula, households and businesses in the Upper Peninsula for the most part have no alternative to propane for home heating, cooking, and powering farm and industrial equipment. What's more, there are no other propane backup sources in place to supply current residential and commercial customers if Line 5 is shut down.

Refineries in Michigan, Ohio, Pennsylvania, Ontario, and Quebec would lose about 45 percent of their crude oil input in the event of a Line 5 disruption. This would force them to seek out more expensive sources of delivered crude oil to keep their operations going, while passing on these higher costs to end users of gasoline, diesel, and jet fuel. Airports and air carriers across the Midwest, but especially Detroit Metro Airport with its huge Delta Airlines hub, would be most exposed to a jump in jet fuel prices.

The agricultural sectors in other Midwestern states, such as Illinois and Wisconsin, are also vulnerable to a shutdown of the pipeline. Propane and diesel fuel, critical for operating farm equipment and heating rural homes, would likely become more expensive as processors and refineries are forced to seek alternative suppliers. Petrochemical products used in agriculture, such as polyvinyl chloride, plastic mulch, and greenhouse covers, could also become more expensive for Midwestern farmers.

Most significantly, a shutdown of Enbridge Line 5 will result in the direct loss of high wage jobs and tax receipts for state and local governments. For example, Enbridge estimates the company pays more than $89.6 million in direct state and local taxes annually to the states of Michigan, Ohio, Pennsylvania, and Indiana for Enbridge Line 5 and other pipelines. Further, the ripple effects of the closure will result in additional job, income, and tax losses.

In the following analysis, we amplify the likely economic losses that would attend a shutdown of the Enbridge Line 5 pipeline. We also look at the broad impacts on consumers and businesses and provide some rough estimates of the higher costs they will face for home heating and gasoline. Finally, we discuss the consequences of a Line 5 shutdown on the regional economic competitiveness of the Midwest, which has been losing people and jobs to other parts of the country for decades.

[1] https://www.enbridge.com/media-center/our-economic-benefits-by-state-and-province .

IDENTIFYING INDUSTRIES AFFECTED BY SHUTTING DOWN LINE 5

To assess the potential impacts of shutting down the Enbridge Line 5, we consider two value chains of economic activity. The first deals with pipeline operations. Closing Line 5 will eliminate jobs in Michigan, Wisconsin and other states and provinces, affecting the professional staff who operate, maintain, and repair the pipeline, along with all of those individuals who keep up with related administrative functions including regulatory reporting. In addition, there are the companies providing goods and services that form the value chain of inputs into pipeline operations. Supporting industries that would lose business from a Line 5 shutdown include contractors engaged in maintenance and repair operations, engineers and other professional services, environmental and technical consulting services, fabricated structural metals, insurance carriers, trucking companies and many other sectors of the Michigan economy.

A second set of broad value chains are the companies that use the materials transported in Line 5. Some of these industries have been clearly identified in public testimony regarding the potential impacts of shutting down this important energy commodity conveyance. These include refineries, especially those in neighboring states, Michigan farmers, and others that we will discuss below.

Importantly, our modeling of the economic impacts does not include households who would see energy resources disrupted, with likely increases in costs for heating and other residential uses. These households are key players in the state economy, both as consumers of energy resources and as providers of critical labor inputs that drive the state's industries. Effectively raising the cost of living for these households may reduce purchases from other Michigan businesses as more spending is redirected to energy use. In a worst case scenario, some Michiganders may choose to leave the state, thereby exacerbating labor shortages that already exist in some areas.

For purposes of this analysis, we focus on a handful of key sectors of the regional (multi-state) economy that would see notable supply disruptions of critical manufacturing inputs if Line 5 ceases operations. The first is the loss of oil feed stocks into regional refineries. Based on testimony from multiple sources, two refineries in Ohio that are especially reliant on Line 5 products would be severely impacted, to the point that industry experts believe they would have to cease operations. Contrary to public perception, refineries are usually not cash cows for their owners. Refinery finances have been seriously battered by the economic disruptions caused by the COVID-19 pandemic. Shutting down their primary source of oil just as we begin emerging from the pandemic-induced economic crisis would do irreparable harm.

We also consider several downstream users of natural gas liquids that are transported in Line 5. Among the largest users are a number of important state and regional industries including: plastics manufacturing; the production of anti-freeze and similar chemicals; detergents; synthetic rubber; and the refining of ethanol. To be extraordinarily conservative in our estimates of the impacts of a Line 5 shutdown, we assume that each of these downstream industries will see a reduction of activity but would remain in operation, with the exception of the aforementioned Ohio refineries. Moreover, the industries included in this analysis represent just a portion of the sectors of the state and regional economies that would be negatively affected by closing Line 5. Details on our modeling assumptions and findings are presented in the following section of this report.

A CONSERVATIVE ESTIMATE OF THE ECONOMIC AND FISCAL IMPACTS OF CLOSING ENBRIDGE LINE 5

In performing our analysis of the effects of closing the Enbridge Line 5 pipeline, we estimate the economic activity, jobs, and state tax revenues at risk. The magnitude of actual loss could be less but will likely be more than our estimates because of our conservative approach in assessing industry-level impacts. Some proponents of closing Line 5 argue that alternative supply sources and routes would emerge spontaneously to replace the energy commodities lost. Moreover, they claim that the new modes of shipping or the creation of new, much longer land-only pipelines would cause energy costs to rise only marginally. This defies the logic of comparative operating costs for other shipping modes and the capital costs of building new land-only pipelines. This simplistic assertion also does not take into account the market effect of a price increase in raw materials and energy that would be borne by those firms relying on Line 5. Production could be shifted to other facilities as customers shift purchases to those firms not affected by the Line 5 shutdown.

OUR KEY ASSUMPTIONS IN ASSESSING THE DIRECT MARKET EFFECTS OF LOSING THE COMPETITIVE ACCESS TO COMMODITIES TRANSPORTED BY ENBRIDGE LINE 5 INCLUDE:

- Two Toledo, Ohio area refineries (PBF Energy and BP Husky) will likely cease operations, based on recorded statements and testimony by business and union leaders.
- The Marathon refinery near Detroit and refineries in Indiana and Pennsylvania will remain open but will operate at a reduced level in response to commodity supply and cost constraints.
- Downstream industries that use natural gas liquids in their production processes will see a reduction in total output resulting from higher input costs and commodity supply constraints. For each of these industries we created a market impact assumption of a permanent loss of 10% of market share. The immediate impacts of a Line 5 shutdown could be larger, but some market share could be recovered. It is possible that market share losses would substantially exceed the modest assumptions used in this

analysis. This is not a doomsday scenario but recognizes that impacted firms operate in competitive markets where their competitors can take advantage of market disruptions. The industries included in this modeling exercise include:

- Plastics manufacturing
- Antifreeze and similar chemicals manufacturing
- Detergents and similar agents manufacturing
- Synthetic rubber manufacturing
- Ethanol refining

To be conservative, we did not model the downstream impacts of all crude oil refining outputs nor the loss of competitiveness as firms absorb the higher costs of heating and transportation fuels that would accompany the shutdown of Line 5 and its resulting effects on energy supplies across industrial value chains.

Modeling how these changes in industrial output would flow through the impacted state economies is based on the IMPLAN economic input-output model developed by MIG, Incorporated. The IMPLAN model is widely used in academic and professional research. The model, which is based on industry interaction tables developed by the Bureau of Economic Analysis of the U.S. Department of Commerce, estimates how spending flows through industries across a value chain and to households that are labeled as direct, indirect, and induced effects. Direct effects represent the spending by the subject firm or industry. In this case, direct spending includes Enbridge 5 operations plus the value of production at risk through commodity supply disruptions.

Indirect effects capture the economic value of transactions across the value chains on impacted industries. For example, Enbridge purchases metal products to rebuild a pipeline support structure. The manufacturer of the structural metal purchases steel, equipment, supplies and other materials, as well as accounting services. The accountant, in turn, hires bookkeepers, rents an office, purchases office supplies, and so on. At each stage of spending, the model adjusts the effects to account for spending that leaves the state economy, such as purchasing office equipment that is not produced in Michigan.

Induced effects are the economic value of household spending by employees of Enbridge and all the value chain suppliers as they use their earnings to purchase goods and services in the state economy. When added together, the sum of the adjusted impacts is larger than direct firm spending, which is the "multiplier effect." These effects are estimated for output (business transactions), gross state product, labor income, and employment, as well as estimates of state tax revenue. To be clear, multipliers work both ways. When a new business comes to the state, it "creates" additional jobs in the economy. If a business closes or reduces its output, the losses spread across the value chain for that industry.

Estimates of potential economic losses caused by the closure of Line 5 are summarized in Table 1. The economic losses for each affected state will be in the billions of dollars while thousands of jobs could be

lost. The states included in this analysis will collectively forego more than one-quarter of a billion dollars in tax revenues per year. Over time, some of these losses may be recovered; but that recovery would require sizable new investment and could take years to bring to market. As a risk assessment, it is prudent to assume these projected revenue losses are permanent.

TABLE 1:
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Sources: Authors' estimates; IMPLAN

AN ENBRIDGE LINE 5 SHUTDOWN MAY FURTHER ERODE THE MIDWEST'S ECONOMIC COMPETITIVENESS

For the past 50 years, the industrial Midwest has been the slowest growing region of the country in terms of population and employment, a trend that was particularly evident in the first decade of the new Millennium. As indicated in Table 2, all six of the states that comprise America's "industrial heartland"—Illinois, Indiana, Michigan, Ohio, Pennsylvania, and Wisconsin—recorded population growth rates well below the U.S. average of 6.3% between 2010 and 2019. Illinois actually lost population over the nine-year period while Michigan and Pennsylvania barely grew at all. Between 2018 and 2019, Illinois, Michigan, and Pennsylvania lost people while extremely slow population growth was recorded in Ohio and Wisconsin. Only Indiana showed sizeable population gains (see figure 2 on page 14).

Slow or negative population changes have been driven by huge numbers of residents leaving each of the six states for other parts of the U.S., mainly the South and West. Combined, the industrial Midwest recorded net domestic out-migration of more than 1.7 million people between 2010 and 2019, with Illinois alone losing nearly 866,000. Population losses would have been ever greater absent positive international migration; but that has come to a halt as a result of Covid-19 restrictions.

TABLE 2:
POPULATION CHANGE IN SELECTED MID-WESTERN STATES, 2010-2019

State	2010 Population	2019 Population	% Change In Population, 2010-2019	Net Domestic Migration, 2010-2019
Illinois	12,830,632	12,671,821	-1.20%	-865,873
Indiana	6,483,802	6,732,219	3.80%	-48,857
Michigan	9,883,640	9,986,857	1.00%	-266,084
Ohio	11,536,504	11,689,100	1.30%	-217,531
Pennsylvania	12,702,379	12,801,989	0.80%	-256,728
Wisconsin	5,686,986	5,822,434	2.40%	-72,006
United States	308,745,538	328,239,523	6.30%	

Source: U.S. Census Bureau

TABLE 3:
PAYROLL EMPLOYMENT MID-WESTERN STATES, 2010-2019 (THOUSANDS)

State	2010 Employment	2019 Employment	Employment Change	% Change In Employment
Illinois	5,610.7	6,124.6	513.9	9.2%
Indiana	2,793.0	3,166.2	373.2	13.4%
Michigan	3,861.4	4,442.7	581.3	15.0%
Ohio	5,030.6	5,586.8	556.2	11.1%
Pennsylvania	5,615.5	6,065.9	450.4	8.0%
Wisconsin	2,735.3	2,981.4	246.1	9.0%
United States	131,624	152,846	21,222	16.1%

Source: U.S. Census Bureau

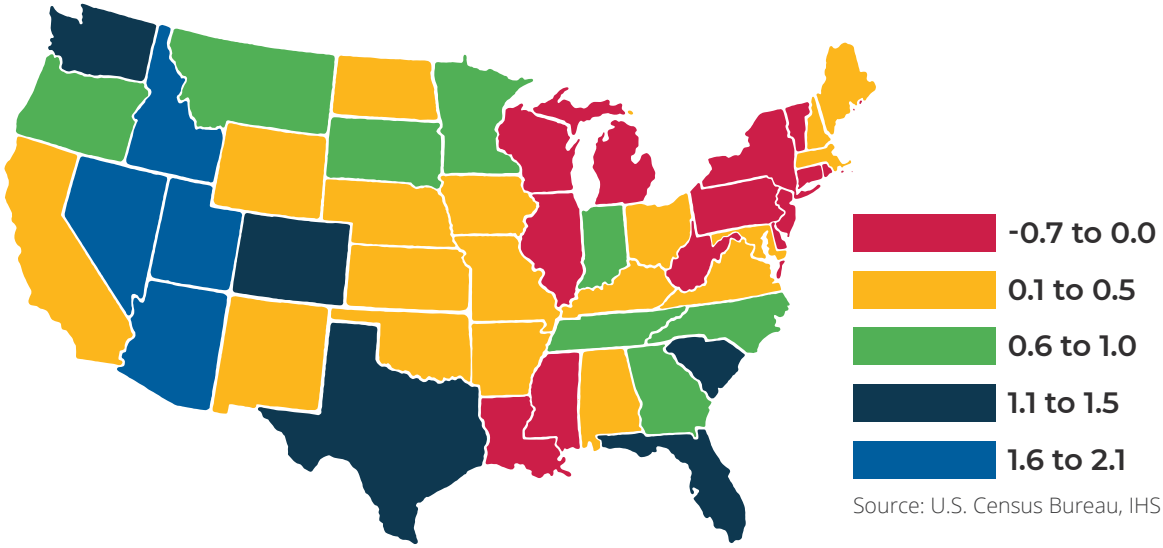
The region has also recorded sub-par job gains over the past decade (see Table 3). Between 2010 and 2019, a period of strong economic growth for the nation, only Michigan came close to the national rate of 16.1% employment increase, mainly due to a booming demand for automobiles. Illinois, Pennsylvania, and Wisconsin fared the worst.

Below average population and job growth can be attributed to a number of factors. The cost-of-living and the costs of doing business tend to be higher in the Industrial Heartland than in the Sunbelt South, where many people and industries from the Midwest have relocated. Most Sunbelt states offer lower labor costs, less expensive housing, lower personal and business taxes, cheaper energy costs, and a lighter hand of regulation than is typically found in the industrial Midwest. And southern and southwestern states are generally perceived to be more "pro-business" than those in the Midwest.

One area where the Midwest does appear to be competitive is transportation fuels costs, perhaps a reflection of the abundance of refineries that dot the region. As shown in Figure 3, on page 14, gasoline prices are at or below the national average, with the exceptions of Illinois and Pennsylvania. However, as discussed above, the shutdown of Line 5 would result in higher fuel prices for households and businesses, thereby eroding one of the Midwest's competitive advantages.

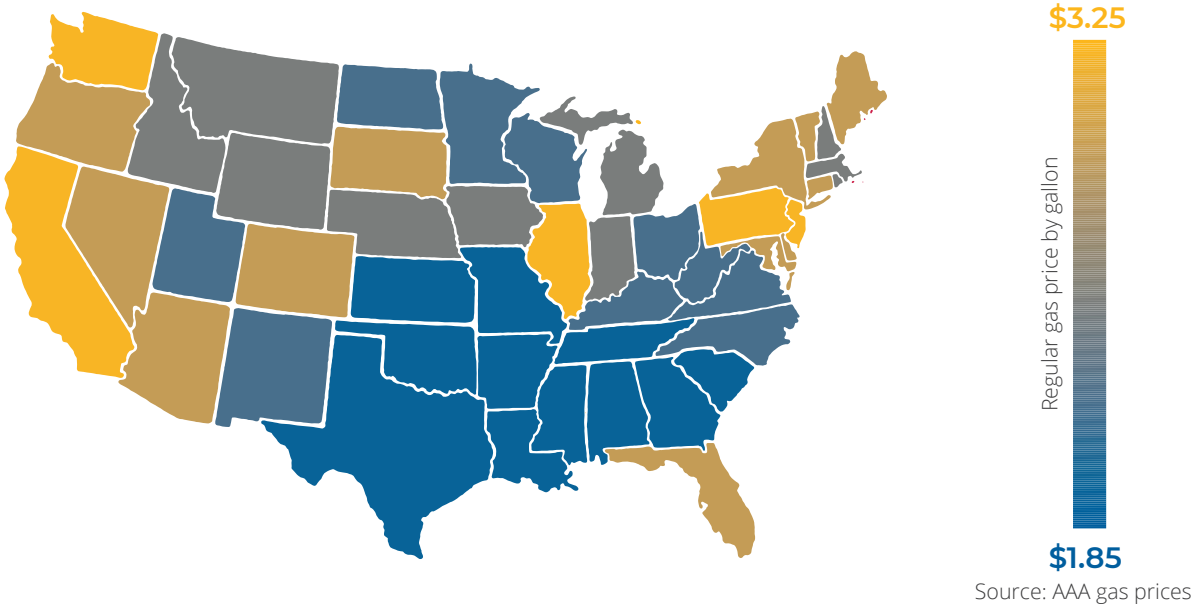
The battle against Enbridge Line 5 is not just about a pipeline. Should Line 5 actually be shut down, not only will the region see job losses, diminished tax receipts, and higher energy costs but it's "anti-business" reputation will be reinforced. The consequence will be a continuation of the exodus of people and jobs to other parts of the country.

FIGURE 2:
POPULATION CHANGE BY STATE, 2018-2019



Source: U.S. Census Bureau, IHS Markit

FIGURE 3:
REGULAR GAS PRICE PER GALLON BY STATE



Source: AAA gas prices

[2]Data for 2020 are not included because of the severe economic disruptions caused by the Covid-19 pandemic.

[3]In the latest Forbes ranking of Best States for Business, Indiana, at #12, is the only Midwestern state in the top tier. https://www.forbes.com/best-states-for-business/list/#tab:overall

CONCLUSION

Enbridge Line 5 ships as many as 540,000 barrels a day of oil and natural gas liquids and serves as a key energy provider in Michigan and other Midwestern states, as well as the Canadian province of Ontario. As discussed above, its shutdown would be extremely disruptive to many industries and would likely result in higher prices for gasoline, diesel, jet fuel, and propane for consumers and businesses in the region. International airports in Detroit and Toronto would have to turn to alternate suppliers for fuel, incurring higher transportation costs that would be delivered by rail or tanker truck. The Midwest's large farm sector would also face higher costs for fuel and petrochemical products critical to the food supply chain.

In addition to higher fuel prices, job losses, and reduced state and local tax receipts, closure of Line 5 would have serious consequences for U.S.-Canadian relations. The Canadian government is already unhappy about the decision by President Joe Biden to cancel TC Energy's Keystone XL pipeline, which would have transported 800,000 barrels per day of crude oil from Alberta to refineries in Texas and the Midwest. Canadian Natural Resources Minister Seamus O'Regan has signaled that a shutdown of Enbridge Line 5 is "non-negotiable" for Canada. In addition, the closure of Line 5 would violate the 1977 Agreement between the Government Of Canada and the Government of the United States Of America Concerning Transit Pipelines signed by the Carter Administration.

Governor Whitmer's proposed shutdown of Enbridge Line 5 has little to do with safety and much to do with politics. Crude oil and natural gas liquids have crossed the Straits of Mackinac for 68 years without any leakage. What is more, in 2018 former Governor Rick Snyder signed legislation to create the Mackinac Straits Corridor Authority, and its board approved an agreement with Enbridge to build a $500 million utility tunnel under the Straits. The tunnel will be drilled up to 250 feet below the Straits and would house a 30-inch pipeline designed to fully contain any spill that might occur within it. Enbridge has already received state environmental permits for the project, and construction of the tunnel is expected to start this year, if federal permits are approved, with completion in 2024.

In short, a shutdown of Enbridge Line 5 would be bad for the economy of the Midwest and bad for U.S.-Canadian relations. In addition, its closure would have no positive environmental benefits, such as lower greenhouse gas emissions, as refineries, chemical plants, and propane processors currently dependent on Line 5 will simply seek out higher cost suppliers of crude oil and natural gas liquids.

[4] For example, a March 2021 analysis by Michael Sloan of ICF International concluded that loss of the pipeline would shift propane production out of the region and boost prices by 10 to 14 cents per gallon. https://www.mlive.com/public-interest/2021/03/energy-consultant-testifies-line-5-closure-would-hike-propane-costs.html

[5] https://www.bloomberg.com/news/articles/2021-04-13/enbridge-s-great-lakes-pipeline-is-non-negotiable-for-canada

ABOUT THE AUTHORS

BERNARD L. WEINSTEIN, Ph.D.

Bernard L. Weinstein retired on January 1, 2021 as Associate Director of the Maguire Energy Institute and an Adjunct Professor of Business Economics in the Cox School of Business at Southern Methodist University in Dallas. From 1989 to 2009 he was Director of the Center for Economic Development and Research at the University of North Texas, where he is now an Emeritus Professor of Applied Economics.

Dr. Weinstein studied public administration at Dartmouth College and received his A.B. in 1963. After a year of study at the London School of Economics and Political Science, he began graduate work in economics at Columbia University, receiving an M.A. in 1966 and a Ph.D. in 1973. He has authored or co-authored numerous books, monographs and articles on the subjects of economic development, energy security, public policy and taxation, and his work has appeared in professional journals such as Land Economics, Challenge, Society, Policy Review, Economic Development Quarterly, Policy Studies Journal, and Annals of Regional Science. His op-eds have been published in The New York Times, The Wall Street Journal, The Washington Times, Investor's Business Daily, The Financial Times, The Los Angeles Times, The Hill and a number of regional newspapers and magazines.

From 2011 to 2014 he was a Fellow with the George W. Bush Institute, and he is currently an Associate of the John Goodwin Tower Center for Political Studies at SMU and a Fellow of Goodenough College in London.

TERRY L. CLOWER, Ph.D.

Terry L. Clower is Northern Virginia Chair and Professor of Public Policy at George Mason University. He is also director of GMU's Center for Regional Analysis. The Center provides economic and public policy research services to sponsors in the private, non-profit and public sectors. Prior to joining GMU, he was director for the Center for Economic Development and Research at the University of North Texas.

Dr. Clower has authored or co-authored over 200 articles, book chapters, and research reports reflecting experience in economic and community development, economic and fiscal impact analysis, labor market analysis, housing, transportation, land use planning, and economic forecasting. His scholarly articles have appeared in Economic Development Quarterly; Urban Studies; Economic Development Review; Regional Studies, Regional Science; the Australasian Journal of Regional Studies; Regional Studies Regional Science, Sustaining Regions; and Applied Research in Economic Development. His most recent publication is the textbook Globalization, Planning and Local Economic Development with Prof. Andrew Beer (Taylor-Francis, London).

Dr. Clower received a B.S. in Marine Transportation from Texas A&M University in 1982, a M.S. in Applied Economics from the University of North Texas in 1992 and a Ph.D. in Information Sciences from the University of North Texas in 1997 specializing in information policy issues and the use of information resources.

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