



Pennsylvania Manufacturers' Association

January 15, 2019

**ECONOMIC MODEL ANALYSIS:
POLYPROPYLENE MANUFACTURING PLANT EXPANSION IN
DELAWARE COUNTY, PA**

David N. Taylor, President & CEO
Carl A. Marrara, MPP, Vice President of Government Affairs

An expanded polypropylene manufacturing facility in Marcus Hook, Delaware County means an initial investment of \$675,000,000.00, 1,000 construction jobs over a two-year period, and an additional 50 full-time jobs at the plant in perpetuity. The economic impact of this initial investment, the support of the 1,000 construction jobs over two years, the 50 permanent plastics and resins manufacturing jobs, and the indirect and induced jobs that support this expanded economic activity totals more than \$1,000,000,000.00 in less than five years. This economic activity does not include upstream jobs and materials to build necessary pipeline infrastructure or downstream plastic products manufacturing and/or complimentary manufacturing activity that will occur with the availability of affordable and abundant polypropylene products.

When Philadelphia-based Braskem USA considered Marcus Hook, Delaware County for an investment in expanded polypropylene manufacturing, there was great enthusiasm about what the massive project could mean to southeastern Pennsylvania. Despite its proximity to an abundant supply of affordable propane, a strong labor workforce, and a ready site, Braskem decided to expand a facility in La Porte, Texas instead of Marcus Hook. The reason why was clear: Pennsylvania lacked sufficient pipeline networks to provide natural gas liquids (NGL) feedstock to the proposed plant site.

This was publicly stated by Braskem USA CEO Mark Nikolich, who said, "I was disappointed to choose Texas, but we had to choose the place where we had easy access to feedstocks." He continued, "Decisions are already being made by businesses like ours to move elsewhere because it has not evolved in Pennsylvania fast enough, completely enough, through the entire logistics chain."

However, there is still hope for a future investment in Pennsylvania as Nikolich also stated, "The Texas polypropylene plant could be a prototype for a future expansion in Marcus Hook, if sufficient pipeline infrastructure is built to keep the facility supplied. We can use this project in Texas as a blueprint for one we'd do in Marcus Hook."

The question remains: How much economic benefit did Pennsylvania lose out on and what could be gained with an enhanced pipeline network in the future?

The initial investment amount is a certain based on the ongoing work in Texas. The investment in the expansion of the La Porte facility will be \$675 million. It is also known that it will require 1,000 construction jobs over two years to support the facility expansion and an additional 50 full-time jobs to support the plastic and resin manufacturing facility once it's fully operational. Before the announcement of the expansion, the existing La Porte and Marcus Hook facilities were more alike than different, but with one major deciding factor: Pipeline infrastructure to provide natural gas liquids (NGL) feedstock.

Returning to the question: What did Pennsylvania miss out on? It's not just the \$675 million initial investment, the 1,000 construction jobs or the 50 additional full-time positions. It's about cultivating an energy-enabled economy. These 1,050 jobs depend on supply chains, distribution networks, warehousing, and all the industries that we utilize everyday – restaurants, stores, healthcare facilities, and much, much more. This economic influx could come to Delaware County and the surrounding area; communities that haven't seen robust economic growth in decades.

Using IMPLAN, a regional economic modeling program, the potential economic activity of a project of this magnitude can be measured, specifically for all impacted counties, including: Delaware, Chester, Philadelphia and Montgomery. The construction project in Texas is estimated to take two years to complete and a similar model can be assumed for a Pennsylvania plant expansion.

First, the analysis of 1,000 construction jobs over a two-year construction period results in significant additional economic activity and jobs for Delaware County and the greater Southeast Pennsylvania region. This is reflected in Table 1.

Table 1 – Economic Impact: 1000 new “Construction of New Manufacturing Facility” Jobs

Economic Indicators by Impact				
Impact ^	Employment	Labor Income	Value Added	Output
1 - Direct	1,000.00	\$81,994,785.24	\$102,462,351.20	\$153,165,699.73
2 - Indirect	99.41	\$8,457,760.38	\$13,898,974.89	\$22,906,323.87
3 - Induced	281.18	\$14,135,564.57	\$24,451,625.34	\$39,667,724.82
Total	1,380.59	\$104,588,110.18	\$140,812,951.43	\$215,739,748.42

For 1,000 “construction of a new manufacturing facility” jobs in Delaware County, Pennsylvania, there would be approximately 381 indirect and induced jobs that would support this economic activity. The labor income (in 2019 dollars) for 1,000 manufacturing plant construction jobs is estimated at \$81,994,785.24 for the first year and rises to \$83,110,971.25 in the second year of the construction phase (2020 dollars). Therefore, the direct total labor income over a two-year period is estimated at \$165,105,756.49. The overall economic impact of a project of this magnitude is \$215,739,748.42 in the first year (2019-dollar estimates) for the support of the construction activity alone.

It is estimated that there would be approximately 100 indirect jobs that would support the 1,000 construction jobs on this project. The top three industries impacted—accounting for nearly one third of those jobs—are wholesale trade, truck transportation, and architectural engineering and related services. Table 2 shows the top ten industries most impacted through indirect employment numbers, with wholesale trade topping the chart with 22.35. This is reflected in Table 2.

Table 2 – Employment Gains: Indirect Jobs from 1,000 “Construction of New Manufacturing Facility” Jobs

Industries by Impact			
Industry	Impact >	1 - Direct	2 - Indirect
		Impact Employment	Impact Employment v
1 395 - Wholesale trade		0.00	22.35
2 411 - Truck transportation		0.00	7.77
3 449 - Architectural, engineering, and related services		0.00	6.09
4 440 - Real estate		0.00	5.34
5 448 - Accounting, tax preparation, bookkeeping, and payroll services		0.00	3.93
6 469 - Landscape and horticultural services		0.00	3.48
7 447 - Legal services		0.00	3.21
8 464 - Employment services		0.00	2.98
9 460 - Marketing research and all other miscellaneous professional, scientific, and technical services		0.00	2.94
10 445 - Commercial and industrial machinery and equipment rental and leasing		0.00	2.55

It is also estimated more than 281 jobs in the induced category would be created to support the overall economic activity of the new manufacturing facility construction industry. Real estate, hospital staff, and full-service restaurants round out the top three, but Table 3 hosts the top ten industries impacted through induced employment.

Table 3 – Employment Gains: Induced Jobs from 1,000 “Construction of New Manufacturing Facility” Jobs

Industry	Impact >	1 - Direct	2 - Indirect	3 - Induced
	Impact Employment	Impact Employment	Impact Employment	Impact Employment ∨
1 440 - Real estate		0.00	5.34	13.73
2 482 - Hospitals		0.00	0.01	12.41
3 501 - Full-service restaurants		0.00	1.85	11.06
4 473 - Junior colleges, colleges, universities, and professional schools		0.00	0.07	10.85
5 502 - Limited-service restaurants		0.00	0.89	10.70
6 400 - Retail - Food and beverage stores		0.00	0.01	9.49
7 485 - Individual and family services		0.00	0.00	9.36
8 475 - Offices of physicians		0.00	0.00	9.34
9 509 - Personal care services		0.00	0.00	7.79
10 503 - All other food and drinking places		0.00	0.45	7.39

For each year that there are 1,000 construction jobs building this new manufacturing facility, the approximate total economic impact of the direct, indirect, and induced jobs from the project is \$208,665,899.35. This is strictly for the construction jobs and does not factor in the additional 50 full-time jobs that would be added at the polypropylene facility upon completion. It has been estimated that the Texas facility will take two years to complete, so this economic activity could be supported for at least two years in Pennsylvania should a similar project be initiated. It is estimated that there would be 89 indirect jobs and 272 induced jobs that would be created to support the 1,000 construction jobs. It should be noted that 1,000 jobs in the construction industry are not created but are rather supported by a project such as the Braskem polypropylene plant expansion.

Upon the completion of the construction (assuming dollar year 2021) there will be 50 additional manufacturing jobs at the expanded polypropylene plant in Delaware County. To support those 50 additional jobs, the economic model projects 72 indirect jobs and 59 induced jobs to support this activity. The total economic output of the 50 direct jobs when combined with the economic activity of the indirect and induced jobs totals \$96,279,829.02. The labor income of the 50 direct jobs total \$10,190,687.17; the labor income of the indirect jobs created totals \$6,859,979.06; and the labor income of the induced jobs totals 2,972,449.44. Because these 50 manufacturing jobs are created permanently, the labor income of the direct, indirect, and induced jobs should rise with inflation, but should remain constant in perpetuity so long as the plant operates at that capacity. This is reflected in Table 4.

Table 4 – Economic Impact: 50 Additional “Plastic and Resin Manufacturing” Jobs

Economic Indicators by Impact					
Impact ^	Employment	Labor Income	Value Added	Output	
1 - Direct	50.00	\$10,190,687.17	\$18,381,142.76	\$69,872,315.33	
2 - Indirect	71.85	\$6,859,979.06	\$10,520,109.45	\$18,113,327.90	
3 - Induced	58.96	\$2,972,449.44	\$5,134,153.41	\$8,294,185.79	
Total	180.80	\$20,023,115.68	\$34,035,405.63	\$96,279,829.02	

With an uptick in plastics and resin manufacturing, other industries in the area will also benefit. Many of these industries support the core manufacturing activity itself. By growing the “plastic and resin manufacturing” workforce by 50 individuals, the total industry in Delaware County would increase by 5.56%. The rest of the top ten industries impacted are represented in Table 5.

Table 5 – Industry Growth: 50 “Plastics Material and Resin Manufacturing” Jobs

Industries by Estimated Growth Percentage					
	Industry Code	Description	Total Output	Impact Output	Estimated Growth Percentage
1	166	Plastics material and resin manufacturing	\$1,259,816,173.92	\$69,984,046.13	5.56%
2	42	Electric power generation - Fossil fuel	\$602,258,581.90	\$545,115.71	.09%
3	50	Natural gas distribution	\$69,135,611.94	\$52,804.49	.08%
4	409	Rail transportation	\$834,603,160.96	\$551,448.15	.07%
5	471	Waste management and remediation services	\$1,012,582,025.23	\$345,731.44	.03%
6	446	Lessors of nonfinancial intangible assets	\$2,231,582,093.23	\$678,490.53	.03%
7	162	Industrial gas manufacturing	\$390,106,883.28	\$108,342.66	.03%
8	411	Truck transportation	\$2,266,788,299.46	\$624,531.35	.03%
9	164	Other basic inorganic chemical manufacturing	\$347,478,014.38	\$95,600.23	.03%
10	461	Management of companies and enterprises	\$13,251,258,071.28	\$3,101,720.93	.02%

From an employment standpoint, the indirect jobs that most closely support the increased manufacturing are plentiful and of high value. The top three include wholesale trade, management of companies and enterprises, and truck transportation. Table 6 includes the full list of anticipated employment gains indirectly related to the creation of 50 new plastic and resin manufacturing jobs.

Table 6 – Employment Gains: Indirect Jobs from 50 “Plastics Material and Resin Manufacturing” Jobs

Industries by Impact				
	Industry	Impact >	1 - Direct	2 - Indirect
			Impact Employment	Impact Employment
1	395 - Wholesale trade		0.00	11.55
2	461 - Management of companies and enterprises		0.00	9.93
3	411 - Truck transportation		0.00	3.63
4	460 - Marketing research and all other miscellaneous professional, scientific, and technical services		0.00	2.44
5	468 - Services to buildings		0.00	2.44
6	409 - Rail transportation		0.00	2.04
7	62 - Maintenance and repair construction of nonresidential structures		0.00	1.88
8	440 - Real estate		0.00	1.80
9	449 - Architectural, engineering, and related services		0.00	1.42
10	471 - Waste management and remediation services		0.00	1.35

Furthermore, the induced jobs that support the overall increased economic activity of the region include real estate, hospitals, and full-service restaurants in the top three. The remaining top 10 induced jobs relating to the creation of 50 new plastics and resin manufacturing jobs are reflected in Table 7.

Table 7 – Employment Gains: Induced Jobs from 50 “Plastics Material and Resin Manufacturing” Jobs

Industries by Impact					
	Industry	Impact >	1 - Direct	2 - Indirect	3 - Induced
			Impact Employment	Impact Employment	Impact Employment
1	440 - Real estate		0.00	1.80	2.82
2	482 - Hospitals		0.00	0.00	2.62
3	501 - Full-service restaurants		0.00	1.02	2.39
4	502 - Limited-service restaurants		0.00	0.72	2.22
5	473 - Junior colleges, colleges, universities, and professional schools		0.00	0.02	2.03
6	400 - Retail - Food and beverage stores		0.00	0.05	1.98
7	485 - Individual and family services		0.00	0.00	1.97
8	475 - Offices of physicians		0.00	0.00	1.94
9	509 - Personal care services		0.00	0.00	1.63
10	503 - All other food and drinking places		0.00	0.37	1.54

Conclusions

In summary, for one year of a two-year construction project, the total economic impact (in dollar year 2019) is projected at \$215,739,748.42. Once the construction phase of a project such as this is completed, the economic impact of expanded plastic and resin manufacturing industry totals (in dollar year 2021) \$96,279,829.02 in perpetuity. In less than five years' time, the total economic impact to the greater Southeastern Pennsylvania region will be over \$1,000,000,000.00 for just the construction and expanded manufacturing activity of the polypropylene manufacturing facility – not including any upstream or downstream industrial activity expansion.

But it is the multiplier effect from a facility like this that is beyond measure. For example, this facility could manufacture yogurt containers. Might a major yogurt/dairy products manufacturer then choose to locate near this facility to shorten supply chains and reduce production costs? It's certainly possible. This "downstream" activity could be transformative for Pennsylvania's dairy industry and the overall agricultural sector. That's just one example of a single product that could find its foundational footprint in Pennsylvania.

From yogurt cups, to bottle caps, to prescription bottles, it is this downstream activity that presents the truly transformative economic opportunity for the entire region. The opportunities are endless, but the lack of pipeline infrastructure in Southeast Pennsylvania renders the area unattractive to investors for future projects such as this one.

However, without a business and regulatory climate that fosters this growth and accommodates the pipeline infrastructure development required to attract additional investment to Southeast Pennsylvania, the area may well remain unattractive to major investors for future projects such as this one.