

The Manufacturing Research Institute of New York State (MRI) is the research, policy, and educational arm of the Manufacturers Alliance of New York, a statewide coalition led by The Manufacturers Association of Central New York (MACNY). The MRI conducts research to increase awareness among the general public, educators, policymakers, and the media about the importance and necessity of manufacturing sustainability to New York State's future economic stability and overall quality of life. The MRI is the first and only research institute for manufacturers solely dedicated to the promotion and advancement of New York State manufacturing.

Manufacturing: The Key to New York State's Export Growth and Economic Success

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Executive Summary

- Manufacturing is critical both to the New York State export sector and to the state's overall economy. While accounting for 6% of the state's GDP, manufacturing represents 80% of the state's exports.
- Exports are critical to the economic health of New York State. Exports create a multiplier effect on local economies as increasing export levels foster growth in supporting services sectors and upstream supply chains.
- New York ranks 3rd among all states in total manufacturing exports, behind only Texas and California. The state has maintained that 3rd position over the last decade by growing exports by a compound annual rate of 4%.
- Canada is the largest export destination for New York State's manufactured goods, with more than twice the exports of the next largest country. New York has rapidly grown its exports to emerging markets such as Israel, Hong Kong, China and India over the last ten years.
- Despite the recent recession, New York State's manufacturing exports grew by 44% over the last decade. A large portion of that growth was due to jewelry and diamond exports to emerging markets. Other export growth industries included machinery, chemicals, automobile engines, medical equipment, fuel oil and petroleum coke.

- Emerging markets, such as China and India, should provide vibrant export markets for New York State manufacturers over the next decade.
- While New York State's energy prices are among the highest in the country, the top export industries are generally less vulnerable to energy price increases than manufacturers in other states. Many of New York's leading export industries are less energy intensive than others, and New York's electricity generation is less reliant on fossil fuels.
- New York State government, industry organizations and export companies must work together to foster export growth.

Manufacturing Exports by State			
	2000 (billions)	2010 (billions)	Annual % Change
Texas	\$99	\$192	7%
California	111	125	1%
New York	38	54	4%
Florida	25	47	7%
Illinois	30	46	4%
Michigan	33	42	2%
Washington	29	41	4%
Ohio	25	40	5%
Pennsylvania	18	31	6%
New Jersey	17	29	5%
Indiana	15	28	6%
Georgia	14	26	7%
Louisiana	9	25	11%
Massachusetts	20	25	2%
Tennessee	11	24	8%
North Carolina	17	23	3%
South Carolina	10	22	9%
Kentucky	8	20	9%
Wisconsin	9	19	8%
Minnesota	10	18	6%
Oregon	9	17	6%
Virginia	39	15	-9%
Connecticut	10	15	4%
Arizona	10	14	3%
Utah	8	14	6%
Alabama	14	14	0%
Missouri	3	13	16%
Iowa	7	13	7%
Maryland	6	11	6%
Kansas	4	10	9%
Mississippi	4	9	8%
Colorado	5	9	6%
Nevada	3	8	11%
Oklahoma	6	6	-1%
Delaware	1	5	14%
Idaho	3	5	5%
Arkansas	2	5	9%
Nebraska	3	5	3%
Vermont	2	5	6%
New Hampshire	2	5	8%
West Virginia	4	4	1%
Maine	2	4	6%
North Dakota	2	4	7%
New Mexico	1	3	7%
Rhode Island	0	2	27%
DC	0	2	13%
South Dakota	2	1	-5%
Montana	1	1	3%
Wyoming	1	1	4%
Hawaii	1	1	7%
Alaska	0	1	12%

Source: TradeStats Express, International Trade Administration

Manufacturing's Role in New York's Economy

Manufacturing is a critical sector in the future growth of the New York State economy. While the decline in manufacturing in New York State – such as Eastman Kodak's declining payrolls in Rochester and Carrier's exodus from Syracuse – has mirrored the nationwide decline of the sector over the last several decades, manufacturing still employs nearly 458,000 workers statewide,¹ and manufacturing output rose nearly 4% between 1999 and 2009.² Overall New York ranks 8th among states in manufacturing output.

Manufacturing plays perhaps its most important role in the export sector. While manufacturing accounts for only 6% percent of the state's GDP, manufacturing represents more than 80% of New York State's exports. New York ranks 3rd among all states in total manufacturing exports, behind only Texas and California.

Exports are critical to the economic health of New York State. Exports create a multiplier effect on local economies as increasing export levels foster growth in supporting services sectors and upstream supply chains. On the national stage, the White House has made exports a national priority as a primary strategy to lead the country out of the recent recession by establishing a goal of doubling exports over the next five years.³

Exports are particularly important to the manufacturing sector. A recent Department of Commerce study concluded that "success in supporting American manufacturing is fundamentally dependent on a successful export policy."⁴ Exports are critical to the economic health of the state.

¹ Source: New York State Department of Labor

² Output based on GDP. Source: Bureau of Economic Analysis, U.S. Department of Commerce

³ "White House Unveils Plan to Double U.S. Exports." *The New York Times*, 4 February 2010.

⁴ *Exports Support American Jobs*. International Trade Administration. United States Department of Commerce. Tschetter, John. Page 1.

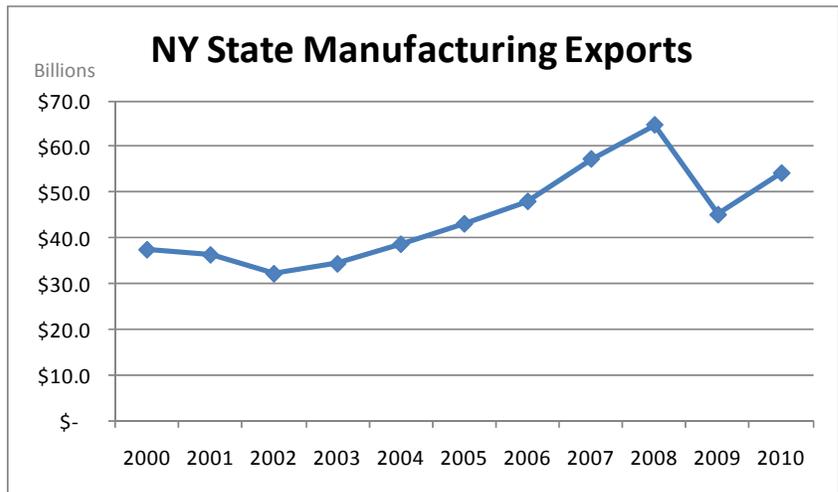
Manufacturing Export Intensity by State (2008)		
1	Florida	39%
2	Washington	38%
3	New York	35%
4	Vermont	33%
5	Nevada	32%
6	Arizona	30%
7	Massachusetts	27%
8	Texas	27%
9	Idaho	24%
10	California	24%

Source: Annual Survey of Manufactures, U.S. Census Bureau; TradeStats Express, International Trade Administration

New York State's 2010 manufacturing exports were 44% higher than 2000 levels.

The New York State Manufacturing Market

New York State has maintained its ranking as the 3rd largest manufacturing exporter over the last decade by growing exports by a compound annual rate of 4%. A key factor to New York's success in manufacturing exports is that it exports a relatively high percentage of goods that it manufactures. Compared to other states, New York's export intensity (exports divided by value of shipments) is the third-highest.



Source: TradeStats Express, International Trade Administration.

Except for an expected decline in 2009 due to the recession, New York exports steadily climbed over the last decade.⁵ Even with the decrease that year, 2010 exports were 44% higher than 2000 levels.

⁵ All export figures in this study are Total Exports (domestic exports plus re-exports) on a Free Alongside Ship (FAS) value basis.

New York State's primary trading partner is Canada. Israel and Hong Kong are now the state's second and third largest trading partners.

Manufacturing Export Profile

1. Export Partners

It is no surprise, given its close proximity, that New York's primary trading partner is Canada. Even though exports to Canada have dropped slightly over the last decade, New York manufacturers still ship more than twice as many goods to its northern neighbor than to any other country. The industries that represent the most exports to Canada are primary metals, which grew by more than 50% in the last decade, driven primarily by steel production in upstate New York. Transportation equipment represents the second largest export industry to Canada. Computers and electronic products dropped by more than 60% in the last decade to fall to the third spot.

The ranking of the remaining top trading partners has changed significantly in the last ten years. In 2000, Switzerland and Japan were New York's next two top export destinations. By 2010, those two had fallen to 5th and 11th respectively.

2000 NYS Manufacturing Exports (billions)		2010 NYS Manufacturing Exports (billions)			
Canada	\$9.2	Canada	\$8.7	2000 Rank	Annual % Change
Switzerland	3.2	Israel	4.1	1	-1%
Japan	3.1	Hong Kong	4.1	5	9%
United Kingdom	3.1	United Kingdom	3.2	8	12%
Israel	1.8	Switzerland	2.6	4	0%
Mexico	1.7	Germany	2.4	2	-2%
Germany	1.6	China	2.2	7	4%
Hong Kong	1.4	Belgium	2.1	13	13%
Belgium	1.2	Mexico	2.1	9	6%
France	1.2	India	1.8	6	2%
South Korea	0.8	Japan	1.8	14	14%
				3	-5%

Source: Foreign Trade Statistics, U.S. Census Bureau

Exports to Switzerland and Japan have fallen significantly over the last decade.

However these declines were more than outweighed by increases to several emerging markets – including Israel, Hong Kong and China.

Chemical Exports to Japan by State (\$ billion)

	2000	2010	+/-
US Total	6,225	10,612	70%
Texas	797	1,672	110%
California	660	1,065	61%
Puerto Rico	362	844	133%
N. Carolina	270	581	115%
Pennsylvania	164	464	184%
Indiana	231	446	93%
Kentucky	54	419	671%
Washington	231	390	69%
New Jersey	274	384	40%
Georgia	112	369	230%
New York	427	326	-24%

Detailed sub-industry export data are not available at the export origin state to destination country level, but an analysis of additional export data indicates that most of the drop in New York State's exports to Switzerland is due to a decline in primary metals processing, primarily gold.⁶ Most of these exports have shifted to Nevada, which is one of the largest gold mining areas in the world. Over the last ten years Switzerland has become Nevada's largest export market, almost exclusively due to shipments of gold.

The decrease in exports to Japan cut across a larger range of manufacturing industries, however the declines have been largest in computers, electronic products and transportation equipment. Nearly every manufacturing industry in New York State experienced declines in exports to Japan over the decade. Overall US exports to Japan dropped by 15% during the decade. The largest declines were in the computer and semiconductor industries. But New York experienced declines in industries that other states did not. In the chemicals industries, for example, New York is the only state among the top 20 exporters to Japan that experienced a decrease in exports between 2000 and 2010. US chemical exports to Japan increased by more than two-thirds over the decade, with pharmaceuticals providing the largest increase. Pennsylvania and New Jersey, both with large pharmaceutical industries, increased chemical exports to Japan by 184% and 40% respectively during the decade.

Among manufacturing exports to Japan classified as Miscellaneous, which primarily represents medical equipment and supplies and jewelry, New York was the only

⁶ Export data for each state to each country is available at the 3-digit NAICS code level (e.g., 325 – Chemicals and 339 – Misc. Manufacturing), but 7-digit NAICS code data is available for total US exports to each country. By analyzing the export levels at a 7-digit level and relative production levels for each state at the 7-digit level, we were able to determine which industries were responsible for export volume changes at the 3-digit level.

China and India, experienced explosive growth in New York exports over the decade and should be expected to provide future growth.

These two countries could account for almost a quarter of the world's total middle-class consumption by 2020, and 41% by 2030.

state among the top 20 exporters that experienced a decrease in exports over the last decade. As will be discussed below, this sector provided New York State with its largest overall growth over that period, so the decrease in exports to Japan is particularly puzzling.

Despite declining exports, a stagnant economy and the repercussions of the recent earthquake, Japan remains a large economy with attractive export markets. New York manufacturers, especially in chemicals, medical equipment and jewelry, should further analyze the Japanese market to identify export opportunities and to reverse the decline in these key export industries for the state.

Meanwhile, New York manufacturers increased exports to several emerging countries. Exports to Israel more than doubled, becoming the state's second largest export market. This growth was driven primarily by a large increase in jewelry and diamonds. Petroleum and coal products also increased significantly during the decade.

Exports to Hong Kong increased even more to garner the 3rd spot. Again, jewelry and diamonds were responsible for most of the increase. Computers and electronic products also contributed to the growth.

Two other emerging markets, China and India, experienced explosive growth in New York exports over the decade. China's 13% compound annual growth was driven by exports of machinery, chemicals, computers and electronic products. India's 14% compound annual growth was driven primarily by jewelry and diamonds.

China and India should be expected to continue to provide future growth. The middle class in these two countries is growing rapidly, which will allow them to afford more and more goods from the US. Although China currently accounts for only 4% of the world's total middle-class

Manufacturers classified as Miscellaneous more than tripled their exports over the decade.

The jewelry and diamond industries as well as medical equipment and supplies have driven the overwhelming majority of recent export growth.

consumption, and India even less than that, both together could account for almost a quarter of the world's total middle-class consumption by 2020, and 41% by 2030.⁷ China's recent growth in New York exports is especially encouraging since it was experienced across a wider range of the state's manufacturing industries.

2. Industries

Manufacturers classified as Miscellaneous were responsible for most of the increase in exports during this time and have become the leading group of export industries for New York State. Exports in this group of industries more than tripled over the decade. A large range of industries make up this economic classification – from sporting goods to pencils to toys. But in the case of New York State, the jewelry and diamond industries as well as medical equipment and supplies have driven the overwhelming majority of the growth. As indicated above, the amount of exports of jewelry and diamonds to Israel, Hong Kong and India exploded over the last decade. To a lesser degree medical equipment and supplies contributed to the growth. Without the growth among Miscellaneous industries, and jewelry and diamonds in particular, New York State exports would have grown a modest 17% overall during the decade.

⁷ Kharas, Homi, and Geoffrey Gertz. "The New Global Middle Class: A Cross Over from West to East." *Wolfensohn Center for Development at Brookings* (2010): Page 6.

NYS Manufacturing Export Industries (billions)				
	NAICS Code	2000 Exports	2010 Exports	Annual % Change
Miscellaneous manufacturing*	339	\$5.2	\$15.6	12%
Computers and electronic products	334	7.4	6.4	-1%
Machinery	333	5.0	5.9	2%
Chemicals	325	4.7	5.8	2%
Transportation equipment	336	4.0	5.3	3%
Primary metals	331	4.8	5.0	0%
Petroleum & coal products	324	0.1	1.5	33%
Fabricated metal products	332	0.8	1.4	6%
Electrical & components & products	335	1.1	1.3	1%
Food	311	0.6	1.3	9%
Paper	322	0.6	1.1	6%
Others		3.3	3.6	1%
Total		37.5	54.2	4%

* Miscellaneous Manufacturing includes medical equipment and supplies, jewelry, diamonds, silverware, sporting goods, toys, pens, pencils, signs, gaskets, musical instruments, fasteners, needles, brooms, brushed and mops.

Source: TradeStats Express, International Trade Administration.

The second largest export industry in New York State is computers and electronic products, however exports from this sector decreased during the decade.

The second largest export industry in New York State is computers and electronic products, however exports from this sector decreased during the decade. IBM has traditionally been one of the largest companies in this sector in New York State, but its shift of focus from products to services has limited the amount of its goods available for export.⁸ Xerox has struggled over the past decade with accounting issues and declining market share. The number of Xerox employees in Rochester has dropped from almost 15,000 in 2000 to about 7,000 in 2010.⁹

⁸ "Huge Payoff for I.B.M. After a Shift." *The New York Times* 19 Jan. 2010.

⁹ "Xerox Shares Climb After It Tops Street Expectations." *Rochester Business Journal* 22 July 2010. "Xerox to Cut 5,200 Jobs, or 5.3% of Work Force, on Falling Profit," *Los Angeles Times* 1 April, 2000.

The Food and Paper industries experienced substantial growth over the decade.

The New York City metropolitan statistical area (MSA) is the largest export area in the entire country.

Other important industries are Machinery (including turbines and air conditioning systems), Chemicals (primarily pharmaceuticals), Transportation Equipment (led by automobile engines), and Primary Metals (led by steel production). The growth in Petroleum and Coal Products was primarily due to shipments of refinery products (e.g., fuel oil, petroleum coke) sent to Israel, the Netherlands and Canada.

While still relatively small, Food and Paper experienced substantial growth over the decade. Most of the growth in exports of Food was due to an increase across a wide range of food products to Canada. Food exports to Russia also increased significantly to the point where Russia is now New York's second largest destination for food products. For paper products, Canada remains the largest destination country, but China represented the largest growth over the decade.

3. Top Exporting Metro Areas

The New York City metropolitan statistical area (MSA), which includes Long Island and Northern New Jersey, is not only the largest export area in the state, but also the largest in the country. Its \$70 billion in 2009 exports far exceed those of other MSAs in the state.¹⁰ Among upstate MSAs, Rochester represents the largest exporter area, driven primarily by Chemicals and Computers & Electronic Products.

¹⁰ MSA export data includes all industries, not just manufacturing.

Among upstate MSAs, Rochester represents the largest exporter area, driven primarily by Chemicals and Computers & Electronic Products.

Between 2005 and 2008 upstate metro areas experienced a 25% growth in exports

Upstate New York Metro Areas	2009 Exports (\$ billion)
Rochester	\$4.9
Buffalo/Niagara Falls	3.6
Albany/Schenectady/Troy	3.2
Poughkeepsie/Newburgh/Middletown	2.2
Syracuse	1.3
Utica/Rome	0.5
Binghamton	0.3
Ithaca	0.2
Glen Falls	0.2
Kingston	0.2
Elmira	0.1

Source: Sub-National Trade Statistics, International Trade Administration.

Nearly every New York MSA experienced a significant drop in exports during 2009 due to the recession.¹¹ Syracuse experienced the largest drop, with a 35% decline. But between 2005 and 2008 upstate MSAs had experienced a 25% growth in exports.

4. Comparisons to Other States

In one respect New York's export patterns follow those of other states – its largest shipping partner is its neighbor Canada. Canada represents 20% of all US manufacturing exports, and Mexico represents another 13%. China has become the third largest destination for US exports by growing 44% over the last 10 years to overtake Japan.

Texas's ranking as the largest exporter in the US is driven primarily by its proximity to Mexico, which represents 36% of its total exports. Canada represents Texas's second largest market. The largest growth in Texas's exports has been to China, which have increased from \$1.4 billion in 2000 to \$8.0 billion in 2010. Likewise, California's largest

¹¹ Poughkeepsie/Newburgh/Middletown was the only MSA that grew exports in 2009, but only by 1%.

Chemicals are the largest export manufacturing industry for New York's neighboring states New Jersey and Pennsylvania.

New York's chemical industry is larger, but its chemical exports are significantly lower, which could provide an area of future export growth for the state.

export market is Mexico, followed by Canada and China.

Among New York's neighboring states, Pennsylvania and New Jersey have economies most similar to New York's, however the export profiles of these states differ from New York's. While Canada is the top export market by a wide margin for each state, Mexico represents the second largest. By contrast Mexico is New York's 9th largest export destination. For both states Chemicals are the largest exporting industries, which are dominated by pharmaceuticals. Chemicals are the largest export manufacturing industry for both New Jersey and Pennsylvania, compared to the 4th largest for New York.

2010 Chemical Exports			
	Value (\$ billions)	Rank	% of State Export Total
New Jersey	\$7.9	1	27%
Pennsylvania	7.7	1	25%
New York	5.8	4	11%

Source: TradeStats Express, International Trade Administration.

New York's chemical industry is larger than New Jersey's and Pennsylvania's, and pharmaceuticals (the largest exporting subsector for Chemicals) represent approximately the same percentage in each state. Nevertheless New York's Chemical industry exports are significantly lower than those from its two neighboring states, which could provide an area of future export growth for the state.

Industrial electricity prices in New York are 32% higher than the national average.

Policy initiatives should consider each sector's energy intensity and its potential to increase exports in deciding which sectors will benefit most from the programs.

The export profile of New York's other large economic neighbor, Massachusetts, is very different from New York's. Massachusetts is one of the few states that does not claim Canada or Mexico as its top manufacturing export market. The United Kingdom has overtaken Canada in the last two years as Massachusetts's top export destination. Computers and electronic products represent 30% of total manufacturing exports and chemicals and pharmaceuticals represent another 15%.

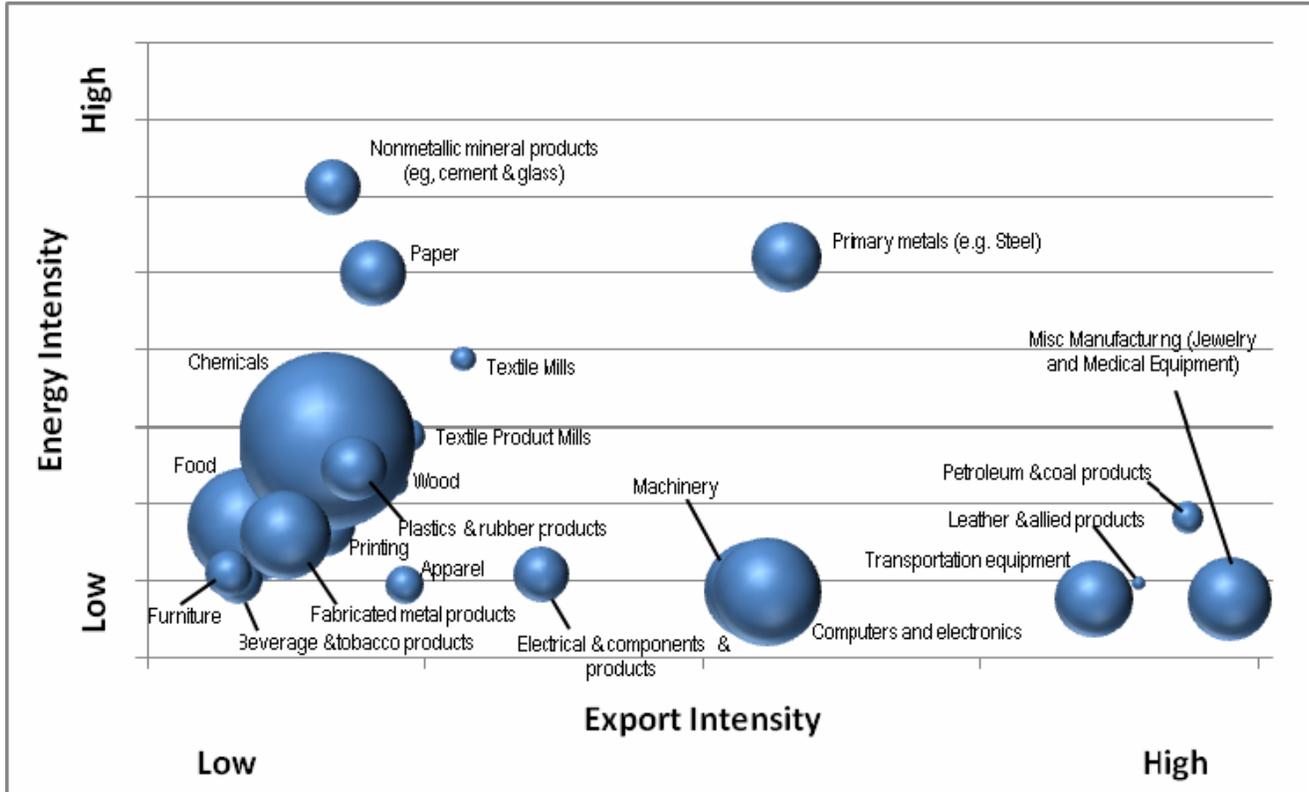
5. Energy Intensity

One of the most critical, and largely uncontrollable, factors on the future of exports in the manufacturing sector is the impact that energy prices and energy policy will have on each industry's ability to compete in the global market. New York has among the highest energy prices in the country. Industrial electricity prices are 32% higher than the national average.¹² Future fluctuations in energy prices that manufacturers have experienced in recent years and the threat of climate change legislation costs lead to uncertainty in a manufacturer's cost competitiveness in global markets. Policy initiatives, such as Recharge New York, which provides lower-cost power to businesses and non-profits, should consider each sector's energy intensity and its potential to increase exports in deciding which sectors will benefit most from the programs.

Energy intensity is defined as energy costs as a percentage of the value of shipments. Energy-related costs will impact industries the most that are energy intensive and that are more highly reliant on exports. In the chart below, New York manufacturing industries are plotted along these two variables. The size of the bubble represents the relative size of each industry.

¹² Source: *State Energy Data System, 2009*, Energy Information Administration.

New York State Manufacturing Industries: Energy Intensity & Trade Intensity



Sources: TradeStats Express, International Trade Administration; US Census, Annual Survey of Manufactures.

New York's manufacturing exports should be less vulnerable to rising energy costs. Primary metals (e.g., steel), which are both energy intensive and export intensive, are an exception.

Many of the export-intensive industries – Miscellaneous (jewelry and medical equipment), Transportation Equipment, and Leather – are less energy intensive. As a result New York's manufacturing exports should be less vulnerable to rising energy costs. Petroleum and coal products use only slightly more energy in the manufacturing process, but their raw materials of course are vulnerable to energy prices.

In general, the highly energy-intensive industries are less export intensive. An exception is the primary metals sector (e.g., steel), which is both energy intensive and export intensive. Steel is a global industry that is intensely price competitive. Other energy-intensive industries, such as Paper and Non-metallic mineral products (e.g., cement and glass),

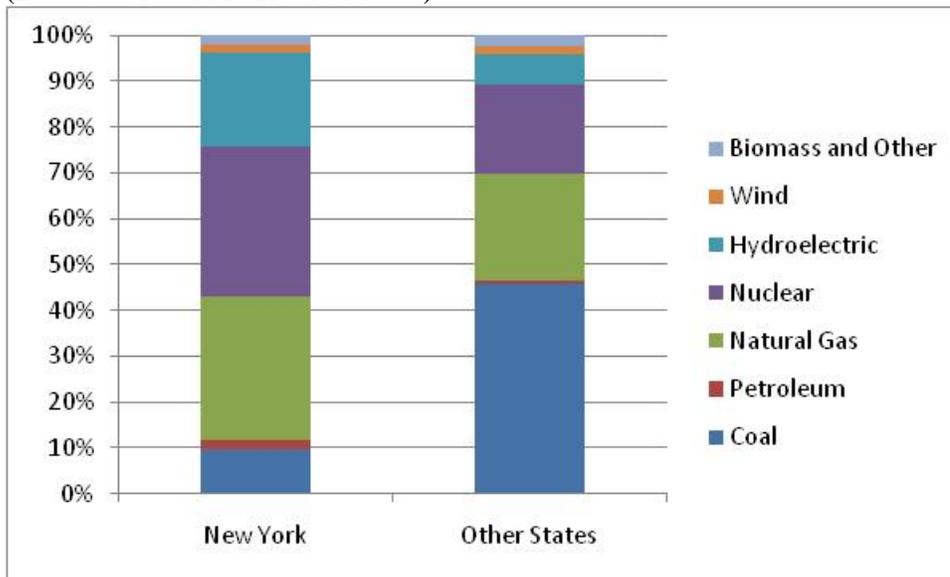
Electricity generation across New York State consumes lower amounts of fossil fuels compared to the national average.

should factor in future energy prices as they pursue export growth.

Although New York State's largest manufacturing industry, chemicals, is energy intensive, basic chemical manufacturing is responsible for most of the energy intensity. Pharmaceuticals, which comprise the majority of New York's Chemicals market, use relatively low amounts of energy. This lower energy intensity reduces the vulnerability of New York State's Chemicals sector to energy issues as it looks to increase exports.

There is another factor that reduces New York State's vulnerability to energy prices and legislation. Electricity generation across the state consumes lower amounts of fossil fuels compared to the national average.

New York State and US Electricity Generation by Source (2009)
(Based on Total MWhs Generated)



Source: Energy Information Administration, U.S. Department of Energy.

A concerted effort to focus resources on the export market is critical to the economic success of New York State.

States need to get smart about assessing exports and the performance of their export promotion activities

Fossil fuels (coal, petroleum and natural gas) represent

only 43% of electricity generation in New York State, compared to 70% for the rest of the US. Nuclear and hydroelectric represent more than half of New York's electricity generation. Not only are those sources not subject to fluctuations in fossil fuel prices, but they also do not emit any carbon dioxide, thus lowering the potential impact of climate change legislation.

Conclusion

Exports from the manufacturing sector are a major economic engine for New York State. The State has a range of manufacturing industries and export partners that provide a strong export base. But in a global economy in which multiple countries, not to mention other states, compete for the same customers, New York State must invest in promoting its export industries.

A recent Brookings-Rockefeller study concluded that states are not doing enough to maximize exports:

“States do not have the data to understand their own export strengths, nor the effectiveness of their existing export programs. State export efforts are reactive, fragmented, and inconsistently funded. Finally, state export efforts all too often ignore (and therefore duplicate and fail to leverage) the export-promoting work of other groups or the federal government. To remedy these problems, bolster their economies, and create jobs in the process, states should:

- Get smart about assessing exports and the performance of their export promotion activities
- Create an export strategy as part of the state's economic agenda

other organizations involved in export promotion”¹³

Studies like this one are a first step. A concerted effort to focus resources on the export market is critical to the economic success of New York State. It is incumbent upon not only the state government but also trade organizations and companies themselves to identify the best opportunities for growth in exports and to invest in the proper programs to promote manufacturing exports.

- Leverage the resources of

¹³ Katz, Bruce, and Emilia Istrate. "Boosting Exports, Delivering Jobs and Economic Growth." *Brookings-Rockefeller Project on State and Metropolitan Innovation* (2011): Page 1.

About the Study:

This study was conducted on behalf of the Manufacturing Research Institute of New York State (MRI), the research, policy, and educational arm of the Manufacturers Alliance of New York, a statewide coalition led by The Manufacturers Association of Central New York (MACNY). The MRI conducts research to increase awareness among the general public, educators, policymakers, and the media about the importance and necessity of manufacturing sustainability to New York State's future economic stability and overall quality of life. The MRI is the first and only research institute for manufacturers solely dedicated to the promotion and advancement of New York State manufacturing.

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