UTILITY 2.0

2020 ISSUE II

COVID-19 will impact ~1 trillion of import supply chains- a significant opportunity from reindustrialization in the United States.

Are utilities and states ready to benefit?

Post-COVID Reindustrialization: an opportunity for the Utilities

Realignment of supply chains can increase the revenue of US utilities from the industrial sector by 50%

When toilet paper disappeared from the supermarket shelves in the run-up to the COVID-19 lockdown, it showed supply chain vulnerabilities even in near-shore produced items. The shortage of masks, gloves, medicines, and more essential supplies has raised anxiety and shifted public opinion towards the need for each country to have manufacturing of essential supplies within their borders. So, a key question is **how much manufacturing can be brought back onshore post-COVID-19?**

While the answer may differ from country to country, Coronavirus has shown every country that they are vulnerable to supply chain risks. No longer does supply chain diversification mean moving out of China to other low-cost destinations in Asia. Each country might need to think about making some level of their critical supply of essentials at home.

United States imports were ~ 2.1 trillion dollars in 2018. We analyzed US imports, industry segments, and quantified **imports worth ~ 1 trillion dollars can be classified as COVID-19 sensitive** including pharma, telecom, chemicals, paper, among others.

Even before COVID-19, manufacturing imports from Asian low-income countries had dropped by 7% in 2019 and since the 2016 elections, investments in manufacturing have increased due to favorable regulatory and tax environments and raging trade wars which are likely to intensify.

Possible scenarios point to $100-500 billion worth of manufacturing to return to US post-COVID-19. Post COVID-19, conservative estimates can easily add up to nearly 100% of the manufacturing GDP increase achieved in the top 10 US states in the past 5 years. On average, every billion-dollar manufacturing investment generated 3% revenue for utilities from the industrial sector in 2018. In our scenario analysis, utility industrial customer revenue increases by 10-50%.

We believe that US states can revitalize their economies by proactive engagement to attract returning industries. Utilities can play a critical role by serving coveted industrial customers.

We argue that competition will be fierce between states (utilities) and countries to get these high-value customers.

This is the time to plot a strategy for reindustrialization and to revitalize the utility industry in your states/ countries instead of mourning COVID -19 losses.

As always, proactive states and utilities will get the low hanging fruits!

State of US imports and COVID sensitivity scenarios

United States trade in 2019 was ~ 4.4 trillion with a total import of ~ USD 2.4 trillion. According to the Observatory of Economic Complexity (OEC)[1], five countries contribute to 60% of total imports led by China with 21%, followed by Mexico (14%), Canada (13%), Japan (6%), and Germany (5%). The rest of the world is represented by countries that have less than 2% share of US imports each. In terms of total imports, the picture is dominated by Asia (45%), followed by North America and Europe. US trade from South America and Africa is just a meager 1.5 to 3.7%. Figure 1 below shows major countries of import and geographic distribution.

Top US imports consist of machines (28%), transportation (16%), mineral and chemical products (9%), and Metals (5%).

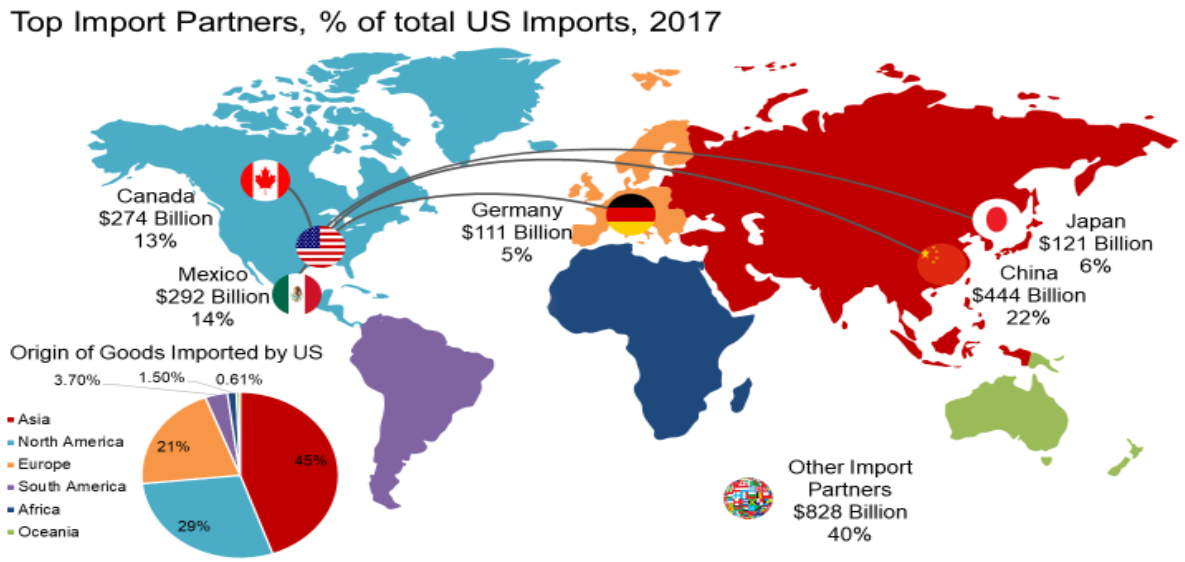


Figure 1: US Imports by country and geography

More cars are imported from Europe, but most daily use items and supplies originate from China. In examining imports more closely, our analysis identified segments that can be considered as **COVID-19 sensitive**. COVID-19 sensitive means segments consisting of life-saving drugs, medical equipment, parts, paper products, chemicals, and certain machines. We found that these COVID-19 sensitive segments consist of $788 billion in imports to the US as of 2017. Further, it can be easily argued that many other categories hide sensitive equipment and supplies out of remaining ~1.2 trillion in imports. There is another ~ 200 billion dollars' worth of import out of the remaining 1.2 trillion dollars US imports which can be considered important in the post-COVID-19 world. **Our analysis indicates that nearly ~**

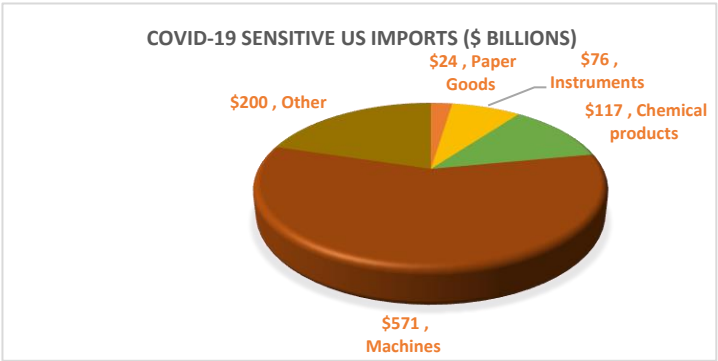


Figure 2: COVID sensitive imports -United States

[1] https://oec.world/en/resources/about/

US $1 trillion in import pie (Figure 2) can be considered available for reindustrialization post-COVID-19. Further, there can be significant export growth which can be attributed to COVID-19 due to high tech, high-value nature of US exports, but for the conservative estimate, one can argue that some exports will reduce due to the same reasons applied by other countries to minimize imports.

Post-COVID-19, how many US imports can be localized?

One fascinating conclusion of our research is that there are not many pundits, big think tanks, or strategy consultants who have put their finger on whether imports from China and other countries will or can move back safely. The closest analysis we found was from a Boston Consulting Group study of August 2011, "Made in America Again[2] whose projection was that 30% of the manufacturing can be brought to the US on a competitive basis by 2015. Factors studied were rising costs of labor and shipping, regulatory changes in some southern states, etc. making it competitive to manufacture in the US.

Further, Kearney analysis[3] indicates that the value of manufactured imports from Asian low-income countries has dropped by 7% in 2019 while US manufacturing gross output remained constant. The main reason for this trend is the trade tariffs imposed by the US and the more general protective policies. We believe that in the post-COVID-19 world, this trend will accelerate. In the same analysis, Manufacturing Import Ratio (MIR) also called the reshoring index, jumped by 98 points. This index was less negative since Trump administration came in power in 2016, indicating a reduction in US imports.

With the difficulty of limited projections on how much production can come back to the US, we have tried to answer this question through scenario analysis.

Post COVID-19 US import scenarios

We developed three scenarios based on extensive literature research and trends and sentiments analysis in the post-COVID-19 scenario.

- **Base case: 25% import localized** – This case is based on studies and analysis which concluded that 30% of imports can be localized due to cost parity. The rationale for this scenario is rooted in the hypothesis that Chinese wages have been rising by about 15% a year since 2000. As a result, the Chinese labor cost in dollars per unit of output is now about four times what it was in 2000. It is estimated that about 25% of what is now offshored would come back if companies quantified the total cost.
- **High case: 50% import localized** – In addition to the base case, this case assumes that national consensus will build towards manufacturing and sourcing of key lifesaving drugs and supplies onshore supported by national and state policies. Further, if America can become just 15% more competitive via sustainable strategies like advanced manufacturing using robots and other forms of automation, lower corporate tax rates and regulations, and a lower U.S. dollar, it can attract additional 25% manufacturing. Post COVID-19, this can be further supported by government policies

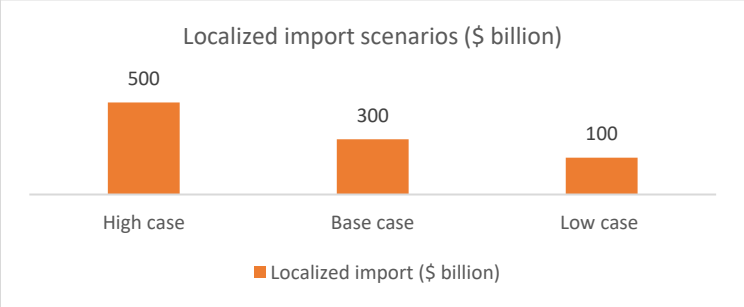


Figure 3: Localized import potential scenario

[2] https://image-src.bcg.com/Images/made_in_america_again_tcm9-111853.pdf
[3] https://www.kearney.com/operations-performance-transformation/us-reshoring-index/full-report

- **Low Case: 10 % import localized** – Investment in US manufacturing was rising at 8-10% in the past few years. This case assumes that COVID-19 impacts diversification but is unable to accelerate reshoring. This case assumes that countries and companies diversify some supply chains back home but diversify in other low-income countries too.

US Manufacturing landscape by states and their electricity sector competitiveness

Manufacturing in the United States accounts for 11.39% of the total economy, employing 8.51% of the workforce. The total output from manufacturing was $2,334.60 billion in 2018. Also, there was an average of 12.8 million manufacturing employees in the United States in 2018.

The contribution of the top 10 states in the US towards manufacturing GDP is ~ 1.24 trillion. As shown in figure 4 below, while the top 10 states contributed ~60% of all manufacturing output in the United States, manufacturing output growth between 2013-2018 was only $116 billion among these states. In this context, the potential addition of $100-500 billion in manufacturing output is significant. It can change the face of US states and their economies. For example, New York with a $74 billion manufacturing GDP contains pharmaceuticals as its top industry. If New York can attract even $20 billion in new investments in COVID-19 sensitive sectors, it can increase its manufacturing GDP contribution by more than 25% and can translate in approximately 100,000 new jobs.

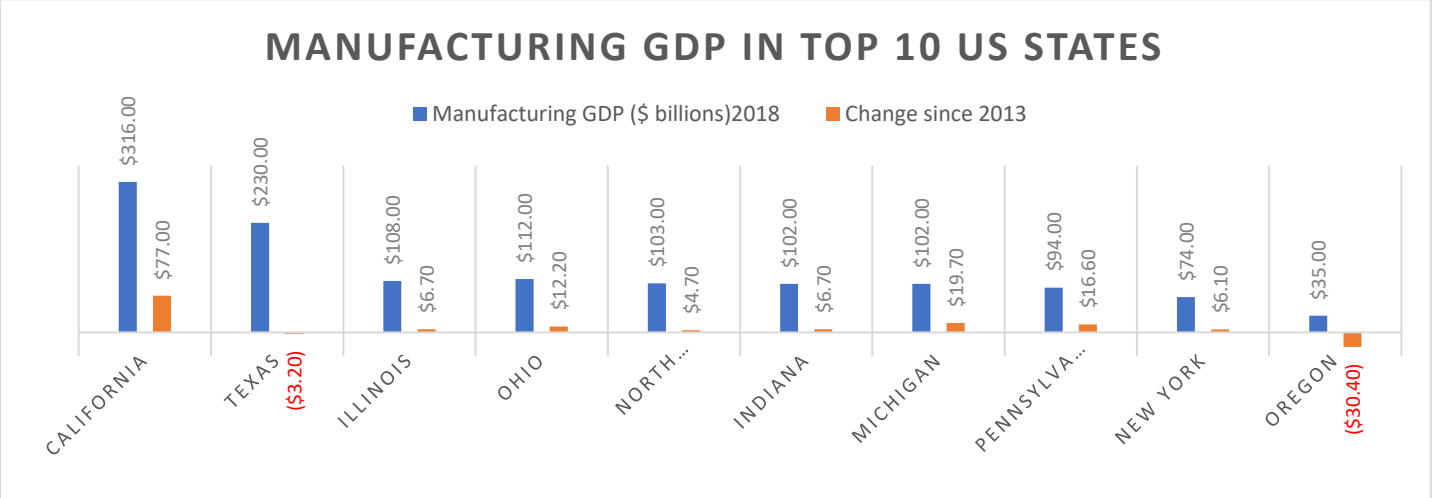


Figure 4: Manufacturing GDP in Top 10 US states

Industrial customers are valuable for the utility industry too since they are considered as the main source of revenue by utilities around the world. The addition of the industrial load will revitalize utilities which are seeing stagnant load and staring at the so-called "Death Spiral".

At present, the industrial sector contributes to 25% of the sale and 17% of revenue in the United States. If the industrial load increases, it leads to significant upside for the utilities and other economic benefits for the states. However, these opportunities will only come to proactive states and utilities.

Analysis of the electricity consumption indicates that the top 10 states account for 45% of industrial consumption and revenue for the utility. Further, on average industrial revenue for the utilities is roughly 3% of manufacturing GDP of the top 10 states. It is very difficult to ascertain where the new manufacturing will come but if we add projected manufacturing scenario in base, high and low case, we can see an average increase in utility revenue from the industrial sector ranging from 10-50%. Industrialization presents a significant opportunity for utilities in these other states. The key questions are who can attract industries and how? Electricity tariff analysis among these top 10 states indicates the competitiveness of utilities in these states. For example, California has the highest electricity rate while New York is among the lowest. Texas has the lowest electricity rates for industrial customers in the US. While other factors will be at play, the electricity sector, along with the states, can do a lot to attract new industries.

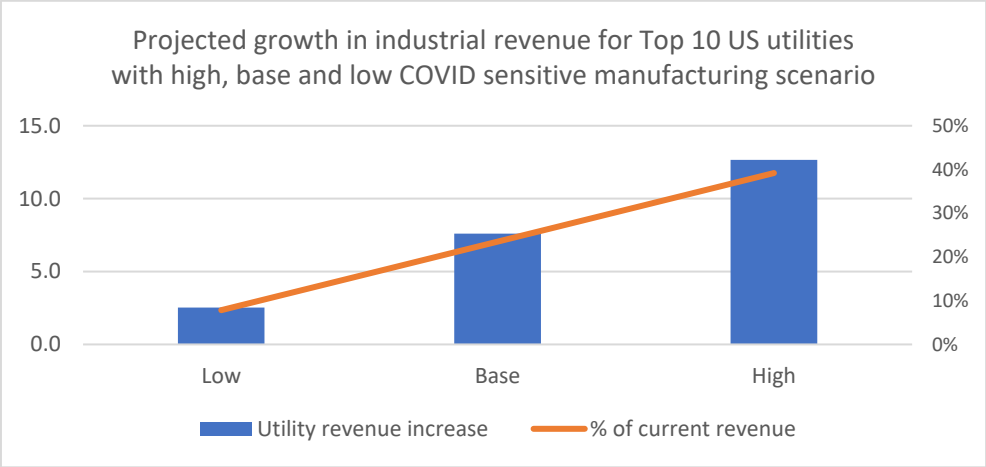


Figure 5: Utility revenue from Industrial customers in Post COVID

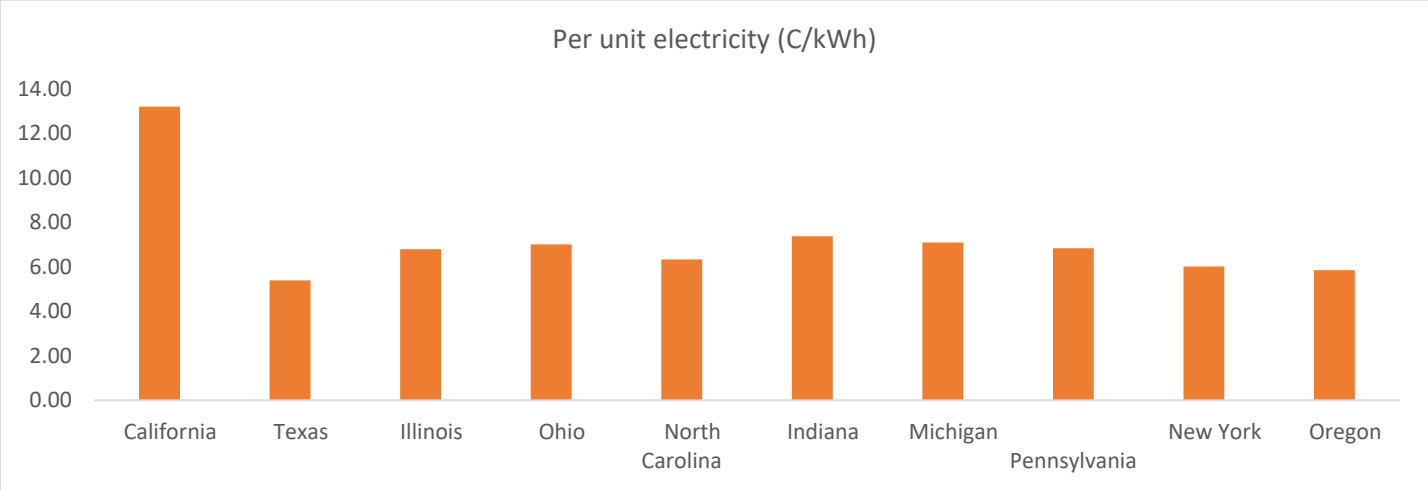


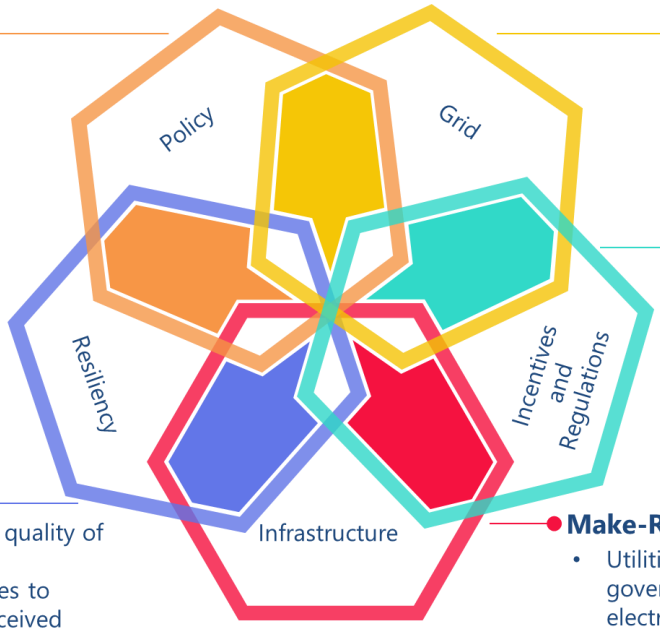
Figure 6: Average utility industrial rates by state

In developing countries, industrial tariffs are used for cross-subsidizing other customer classes and impacts the competitiveness of local industries. A case can be made for industrial tariff reforms, along with a greater role for utilities in providing infrastructure to the industrial sector. This will require renewed planning and coordination among state agencies, utilities, and industries. A proactive approach by a utility to attract, retain and support industrial customers will go a long way in economic recovery (jobs, taxes, revenues) as well as improving the health of electric utilities.

What can states and utilities do to take advantage of reindustrialization?

Following are some of the key actions states and utilities do to attract industrial demand

Proactive Industrial Policy
- States need to evaluate COVID sensitive imports and assess which type of manufacturing they can attract in their state.
- Need to revaluate their industrial policies, analyze cost competitiveness.
- Utilities should be proactive in working with states to help in analysis and policy development.
- Consult existing industries on expansion plans.



Distributed Grid
- Adopt clean and distributed energy resources.
- Highlight flexible, distributed, and automated infrastructure.

Right Incentives and Regulations
- Targeted incentives based on industry policy analysis.
- States mandates certain % of local manufacturing for essential supplies.
- Easier labor law and talent availability.

Resiliency
- Demonstrate reliability and quality of the supply.
- Adopt innovative approaches to maintain supply during perceived climate event.

Make-Ready Infrastructure
- Utilities collaborate with local governments to identify land, ready electricity, gas, water, waste infrastructure.
- Define industrial zones.

Figure 7: Our recommendations

Utility 2.0 – ABOUT the AUTHORS

About Vrinda Inc.

Vrinda Inc. is a New York-based business and technology firm. Vrinda Inc. creates success for your business through a focus on value creation by providing trusted, actionable advice, and practical solutions. We provide business and technology consulting services to the Energy, Utility, and Transportation sectors. Vrinda operates in the United States and Latin America and brings cutting edge expertise to the utility industry. www.vrindainc.com

Navneet Trivedi – Co-Founder and Chief Operating Officer, Vrinda

Navneet co-founded Vrinda Inc. leveraging 27 years of international energy and utility sector experience working with 100+ utilities in 7 countries across the value chain of the utility industry. Navneet is focused on helping C-level executives in some of the largest utilities in the United States and Latin America with their pursuit of clean energy led transformation. Navneet is an electrical engineer and holds a master's degree in renewable energy systems from IIT Bombay, India, and business certification from Columbia University, New York. navneet.trivedi@vrindainc.com

Jenna Lewein—Business Analyst

Jenna is a Business Analyst with Vrinda Inc. focused on DER-led business model transformation, bringing an exceptional understanding of energy policy and analytics. She has over 7 years of experience in working with public and private entities, specializing in the renewable energy and efficiency sectors. She has degrees in Environmental Science and Policy from the University of Minnesota and Columbia University. jenna.lewein@vrindainc.com