

Chemicals & Plastics: Global Market Outlook

It is critical for purchasing personnel to understand supply and demand of the products they buy, so they can advise their business partners of both opportunities (lower cost) and threats (supply disruption) in this space.

In this article I will share global market data for Chemicals & Plastics (C&P) with regional details for installed capacity, operating rates, current (2018) and future (2023) demand and growth rates. This aggregated market analysis was executed on 149 C&P products totaling 3.4 billion MT (7.4 trillion lb.) of global products. These products represent US\$2.7 trillion of revenue in 2018, which, according to the [International Council of Chemicals](#), represents 47% of the global chemical industry, in other words, a very stout representation of total production.

Background

There are thousands of chemical products on the market. However, the data from this market analysis are restricted to chemicals most consumed in the industry (solid, liquid, or gas) that are considered commodity chemicals. For example, they include Caustic Soda, Ethylene, Propylene, Methanol, Sulfuric Acid, among others.

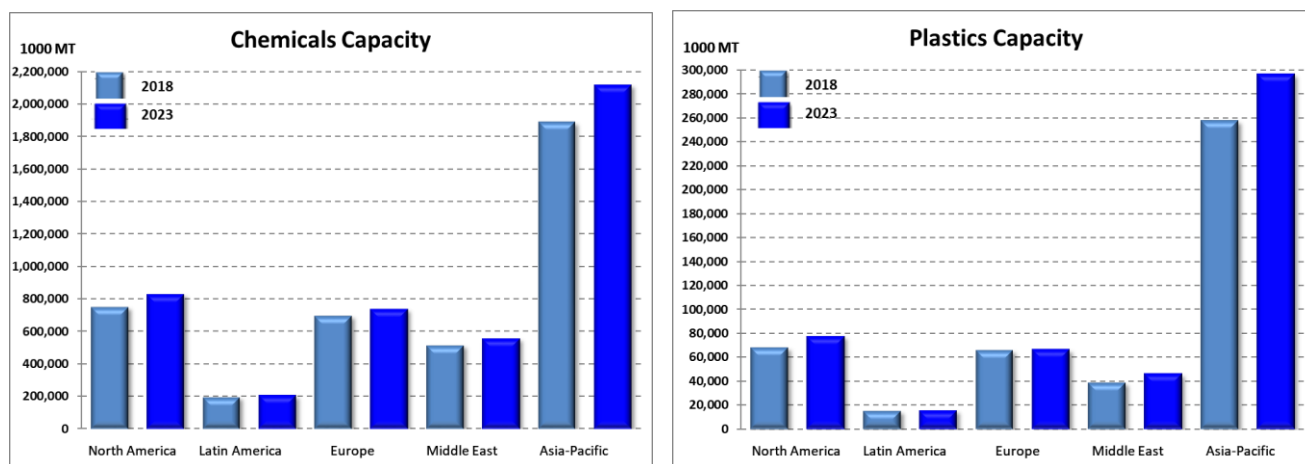
The term Plastics is very broad, and each reader will naturally relate to a different product. Here, I include as a Plastic any polymer (large molecule composed of repeated subunits), thermoplastic or thermoset, elastomer, rubber, copolymer, or resin in any form (pellet, powder, liquid, etc.). Plastics products include Polyethylene (LDPE, LLDPE, HDPE), PET, PP, PVC, Amino resins, Natural Rubber, PS, ABS, PC, PVA, Epoxy, Silicone, and Acrylics. (Here I use the acronyms most widely known in the market.)

In terms of regions, the data was aggregated as **North America** (USA, Canada, Mexico), **Latin America** (Central, South), **Europe** (Western, Eastern, Central, Baltic), **Middle East**, and **Asia-Pacific** (India, Southeast, Northeast, Oceania).

Capacity

The global capacity for all Chemical families is around 4.1 billion MT, where Asia-Pacific represents the highest capacity (47%) among regions shown in Chart I. The global capacity for all Plastics families is around 445 million MT, where Asia-Pacific again represents the highest capacity (58%) of all regions shown below.

Chart 1



As seen above, Asia-Pacific installed capacity in Chemicals (47%) is followed by North America (19%), Europe (17%), the Middle East (13%), and Latin America (5%). In Plastics, Asia-Pacific's installed capacity (58%) is followed by North America and Europe (both 15%), the Middle East (9%), and Latin America (3%).

The high capacity, of course, means a high market demand in the region, but also an alternative for purchasing officers to import from that region.

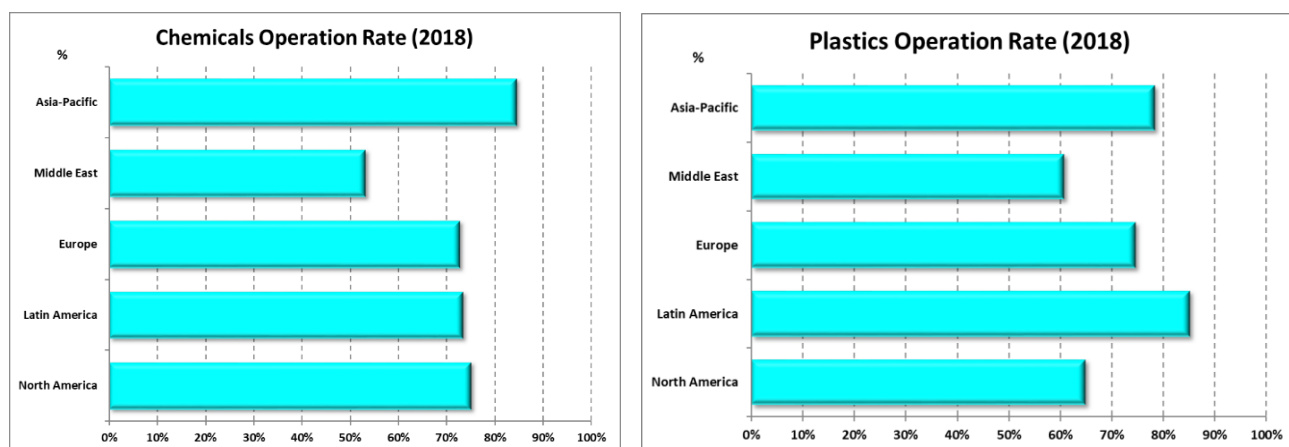
Some C&P capacities show higher concentrations in specific regions. Table A below shows, by region, which C&P have the highest concentrations of capacity (local capacity/global capacity). Having a higher capacity concentration may mean that the region has an abundance of – and likely lower costs for – that specific feedstock. It could also mean lower total unit fixed costs (manufacturing and expenses) because of higher production volumes. Consumers of these products should consider sourcing from these regions.

	Table A - Percentage of Global Capacity				
	North America	Latin America	Europe	Middle East	Asia-Pacific
PLASTICS	Sulfone Polymers (67%)		Polysulfide Elastomer (63%)		Natural Rubber (91%)
	Liquid Crystal Polymers (40%)		Polyisoprene (55%)		ABS (85%)
	Polyvinyl Butyral (35%)		Butyl Elastomers (37%)		PET Polymer (79%)
	Butyl Elastomers (34%)		Biodegradable Polymers (35%)		SAN Resins (76%)
					Organic Fibers (73%)
CHEMICALS	Propanol (70%)	Lithium (43%)	Peracetic Acid (90%)	Bromine (45%)	Calcium Carbide (97%)
	Cellulose Acetate (51%)	Ethanol (26%)	Aluminum Chemicals (63%)	Ethane (36%)	Acetylene (97%)
	Propionic Acid (48%)		Ammonium Nitrate (54%)		Terephthalic Acid (84%)
	Sulfur (48%)		Propionic Acid (40%)		Clorobenzenes (83%)
	Ethanol (47%)		Cellulose Ethers (38%)		Sodium Sulfate (82%)

Operating Rate

Chart 2 shows the aggregated operation rate for Chemicals and Plastics in each region as of 2018.

Chart 2



The analysis of operation rate can be considered from two perspectives: Unit Cost and Product Availability.

Higher percentage represents lower unit fixed costs (in manufacturing and expenses) compared to the other regions on the same basis. Basically, this is because we divide all fixed costs and expenses by a higher volume of produced products. However, each C&P family presents a different impact of fixed costs on the total cost, as well as the magnitude of fixed costs from different sizes of the plants. For example, with Cumene, the unit fixed

cost can be 5% to 7% (highest to lowest capacity) and with Sulfuric Acid, 61% to 75%. For Polystyrene, the unit fixed cost can be 10% to 16% (highest to lowest capacity) and with LLDPE, 33% to 42%.

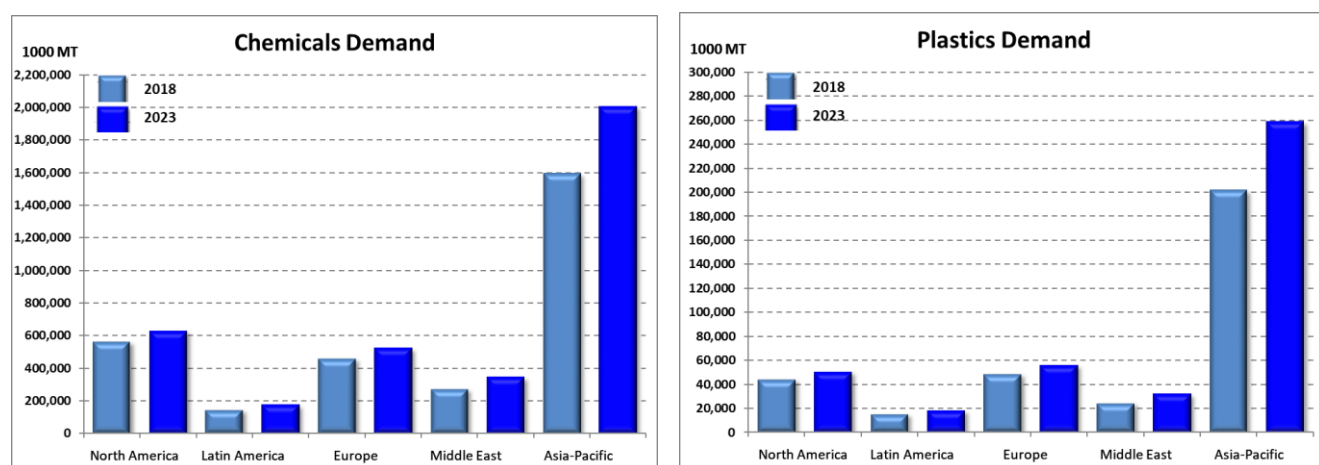
The second perspective is to see where there may be more products available to buy from. In this calculation, we need to consider the operating rate and installed capacity together. Table B shows both data sets by region.

Table B - Operating Rate & Product Availability						
		North America	Latin America	Europe	Middle East	Asia-Pacific
PLASTICS	Oper. Rate (%)	65%	85%	75%	61%	78%
	Volume Available (1000MT)	24,030	2,260	16,685	15,196	55,946
CHEMICALS	Oper. Rate (%)	75%	73%	73%	53%	84%
	Volume Available (1000MT)	187,925	52,437	190,622	239,937	293,566

Demand

Chart 3 shows the aggregated demand for Chemicals and Plastics in each region in 2018 and estimated in 2023.

Chart 3



For Chemicals & Plastics, Asia-Pacific represents the highest demand in 2018 and in the future, followed by North America, Europe, the Middle East, and Latin America. This picture follows the same pattern as shown in Chart 1 – Capacity.

Nine Plastics represent 80% of global demand: PET, HDPE, PVC, LLDPE, LDPE, Amino Resins, Natural Rubber, Polystyrene, and ABS. In Chemicals, ten products represent 49% of global demand: Sodium Chloride, Sulfuric Acid, Ammonia, Ethylene, Ethanol, Propylene, Urea, Sulfur, Methanol, and Caustic Soda.

Volume Growth & Growth Rate

The Compound Average Growth Rate (CAGR) is the growth rate in percentage year over year in a specific region. It reflects the growth of all end-use applications of that specific C&P in a region; besides specific drivers, it is driven by the overall growth of the region's GDP and GDP/Capita.

Chart 4 shows the regional growth rate (CAGR) and Volume Growth for Chemicals, with Chart 5 showing the same for Plastics. As evident for both Chemicals & Plastics, the biggest growth will be in the Middle East, with the biggest volume growth in Asia-Pacific, aligned with the biggest demand and capacity.

Chart 4

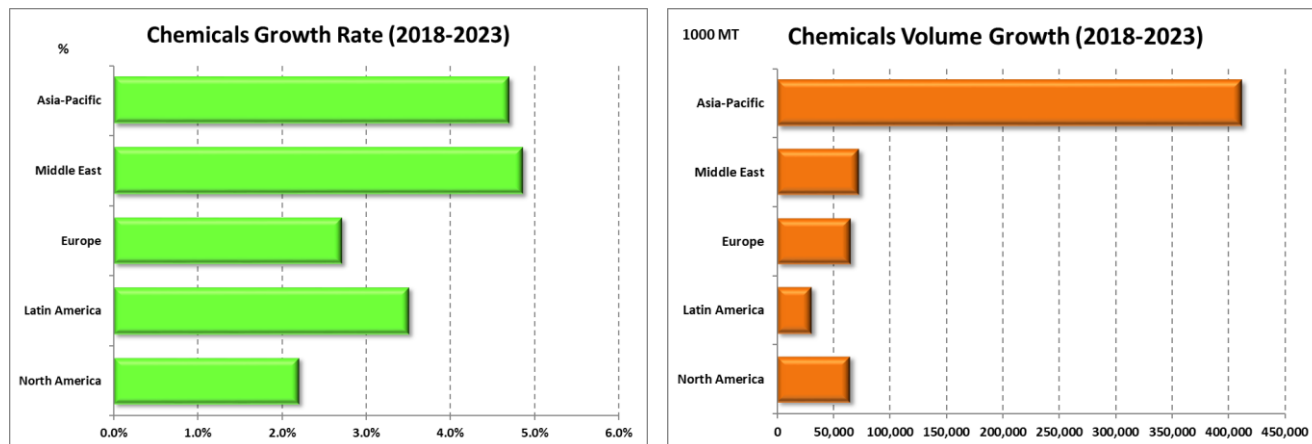
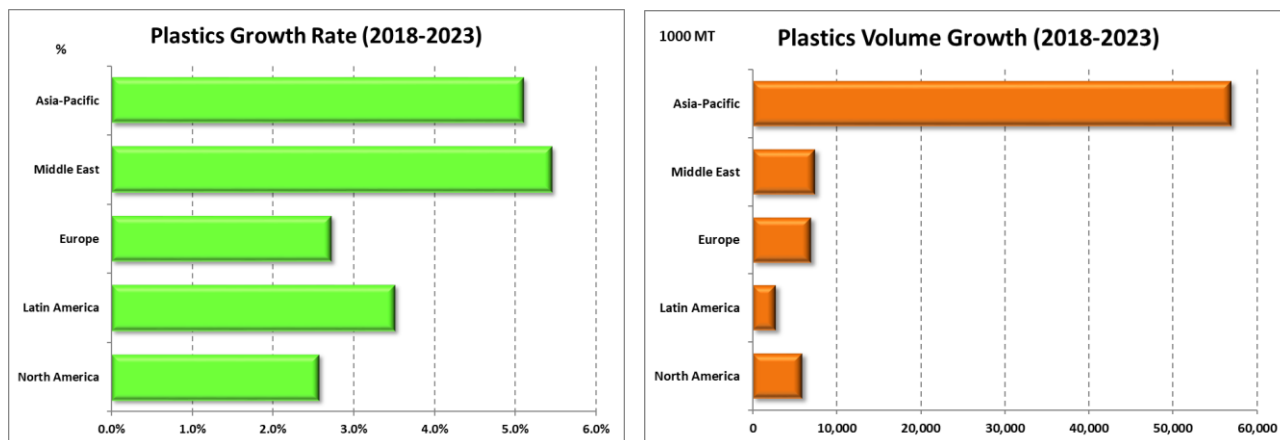


Chart 5



The biggest growth areas in Chemicals will be Rare Earth Minerals (11%), Lactic Acid (9.7%), Calcium Chloride (8.2%), Methanol (8.1%), and Lithium (6.5%). Growth in Plastics will be in Biodegradable Polymers (9.1%), Polyvinyl Butyral (7.0%), Liquid Crystal Polymers (6.1%), Polyamide (5.9%), and LLDPE (5.8%).

Conclusion

Chemicals & Plastics are used across all manufacturing industries as first- or second-tier materials, so it is important to understand market dynamics in the C&P world. From the business perspective, it is imperative to understand the supply and demand of each C&P family and the competitive position in each region in order to define long-term business strategy. From the purchasing perspective, managers need to educate themselves at a granular level on each C&P family they buy, so they can select the suppliers that best fit long-term needs, in addition to identifying opportunity for lower-cost materials.

Taking Purchasing to the next level,

Paulo Moretti

Paulo Moretti is Principal at PM2Consult.com, a boutique consulting company focused on excellence in the purchasing function for manufacturing industries and market analysis of Chemicals & Plastics industries.

Prior to becoming Principal, he worked 35 years at The Dow Chemical Company, developing experience in such diverse areas as Manufacturing, R&D, Sales, Marketing, Finance, Strategic Planning, e-Business, and Purchasing.

Consultant companies specializing in Purchasing with current assignments as SME for chemicals include Efficio Consulting, GEP Consulting, PLG Consulting, Preferred Sourcing Solutions, and Tenzing Consulting.