

JANUARY 2022
PUMPSANDSYSTEMS.COM

PUMPS & SYSTEMS

The Leading Resource for Pump Users Worldwide

**STATE OF
THE INDUSTRY 2022**

WHEN THE SUPPLY CHAIN

BREAKS

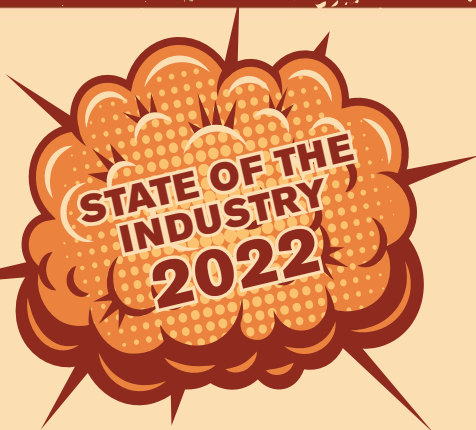
**WHAT DOES BUY AMERICAN
MEAN FOR THE PUMP INDUSTRY?**

**INDUSTRY ASSOCIATIONS
PLAN FOR 2022**

**PROTECT PUMPS IN
FOOD & BEVERAGE**

**HOW ACCURATE ARE YOUR HVAC
PRESSURE INSTRUMENTS?**





17 Experts on Industry Trends, Supply Chain & More

Here's what pump professionals have on their minds as we head into 2022.

PUMPS & SYSTEMS STAFF

1 How have price increases of products or materials impacted your company?

With rising commodity, labor and freight costs, we have seen significant cost increases. While we do our best to shield our customers from this impact, we have passed on some of this increase to our customers.

Brian Sweeney
President, Crane Pumps & Systems

We have seen a varying array of increases depending on the commodity. Metal commodities such as copper, aluminum, nickel and associated alloys all continue to experience significant fluctuations. The biggest surprise has and continues to be freight and the associated logistical challenges and cost increases with receiving and shipping material. We have implemented price increases on selective equipment to offset some of these costs while not creating unnecessary headwinds for our customers.

John Wilson
President, Industrial Flow Solutions

Price increases have had a tremendous impact on our company. Our costs on raw materials have gone up on average 7% to 8%. In some cases, we've seen prices temporarily surge 75% to 100% due to extreme supply shortages. As manufacturers, we want to build products for our customers, so we must pay elevated raw material prices. The price increases are rapid and unpredictable, forcing manufacturers to absorb the higher costs. I expect price increases in our industry to be higher than normal for the new year.

Rob Gledhill
CEO, Blue-White

Pricing is one challenge. Material availability and the ability to physically ship products is another challenging dimension, as well as the climbing costs of logistics. We have been somewhat buffered due to carrying inventory; however, that only gives protection for a period of time.

John Long
Executive Vice President, Product Line and Operations, John Crane

We are in the same situation as everyone. With logistics bottlenecks causing much of the problems, material delivery availability and costs have affected our production capabilities. We continue to source from different vendors and do everything in our control to get our solutions to our customers as timely and cost effectively as possible.

Chris Wilder
Co-owner & CEO, SEPCO

Supplier price increases remain at unprecedented levels in terms of both frequency and volume. When coupled with supply chain disruptions and the related degradation of lead times, the overall volatility is our biggest ongoing challenge. We expect supply chain issues to persist throughout 2022 and beyond.

Christopher S. Brown
President, Geiger Pump & Equipment Company

Cost increases from raw materials, tariffs and logistics adversely impacted our customers by extending existing deliveries and our ability to quote lead times.

Steve Everton
President, Pioneer Pump (Franklin Electric)

Increases in raw material costs due to economic inflation coupled with resurgent demand and supply constraints, from global supply chain issues, have posed a significant challenge to not only our business but the entire industry. Unfortunately, material cost increases aren't the only factor impacting the cost of goods. Labor shortages have created a competitive job market, creating further cost pressure. We are addressing these issues the best we can and responding accordingly.

Mick Corrie
Vice President and General Manager, Inpro/Seal

2 What industry trends are you seeing going into 2022?

The pandemic significantly impacted companies' ability to perform measurement, monitoring and maintenance activities on-site. This drove accelerated adoption of remote and cloud-based alternatives, minimizing the need for employees on-site. We expect this adoption to continue to accelerate, driving demand for condition monitoring solutions.

Aaron Merkin

Chief Technology Officer, Fluke Reliability

We expect the migration to renewable energy sources to be a big trend in 2022. The accelerated focus on reducing carbon footprints will push all companies to add to their sustainability initiatives. We plan to add solar panels to the rooftop of our manufacturing facility and generate more than 50% of our energy demand from the sun.

Chris Wilder

Co-owner & CEO, SEPCO

Coming off COP26 [2021 United Nations Climate Change Conference], 100-plus countries have signed a first-of-its-kind pledge to cut methane emissions by 30% between now and 2030. The signatories represent 70% of the global economy, including six of the world's top 10 methane polluters. Many countries have backed the pledge with new emissions policies, so we see the regulatory landscape heating up headed into next year. The U.S. has already released a suite of tougher oil, gas and pipeline regulations that would prevent tens of million tons from being released, at minimal cost to producers. The EPA predicts they'll cut methane emissions from the energy sector by 75%. Even countries that have not joined the pledge are paying attention. China announced a joint agreement with the U.S. to "enhance ambition" on climate change, saying they would work together to do more to cut emissions this decade while China committed for the first time to reduce methane. At the same time, investors are recognizing the urgency of climate change and the need for sustainable investing, with 88% of global investors rating the environment as the No. 1 priority across all sustainability issues (according to BlackRock). Environmental, social and governance-related factors that can influence future returns are increasingly driving investments. Exchange-traded funds, or ETFs, which are a widely available vehicle to help investors transition to new products with climate considerations, have increased inflow 63 times over the past five years. Midway through 2021, sustainable investments already accounted for \$35.3 trillion, or more than a third of global assets in five of the world's biggest markets with no slow down in sight. In fact, we expect this momentum to further accelerate into 2022 as a growing consensus on the need to address climate risk has been highlighted over the past year by devastating wildfires, flooding and deadly storms.

Amy Simpson

Executive Vice President, Energy Transition, John Crane

The thing that excites me the most is the opportunity around digital to influence and become a real difference-maker in the industry. Generally speaking, industrials have made it a bit challenging to understand the value of digital, and I think we're getting a better sense of how to talk to customers about the outcomes that digital can provide, especially when you complement them with hardware. And when I say outcomes, I mean whatever outcome that municipality or utility desires around efficiency, reliability, lower capex—whatever is important to them—and speaking to them in a language they can understand and translate. There are real solutions out there that either do improve reliability and efficiency or reduce nonrevenue water or any manner of outcomes. We have those capabilities today and we continue to build out our portfolio of digital solutions.

Joe Johnston

*Vice President, Water Infrastructure
North America, Xylem*

I expect that we will see supply chain and logistical challenges for the next 12 to 24 months. ESG-related [environmental, social and governance] programs will continue to receive a higher level of focus and funding. There is a great deal of excitement around the infrastructure bill and what that means for new construction and upgrade activities. Whether or not this occurs remains to be seen.

John Wilson

President, Industrial Flow Solutions

Mergers and acquisitions at both the manufacturer and local distributor level remain a top story. Strong valuations fueled by equity interest in exposure to our general industrial market footprints, coupled with generational turnover at some of the largest and most successful industrial distributors has resulted in a flurry of acquisitions and ownership turnover. As we move into 2022, we expect notable and impactful changes to continue.

Christopher S. Brown

President, Geiger Pump & Equipment Company

At Load Controls, we are seeing the expanded importance of pump distribution partners in the industry. Having a network of partners who are local, knowledgeable and trusted was key to moving through the pandemic and seems sure to increase going forward. To support this trend, we're shifting more of our training, marketing and sales budget to support our partners.

Michael McClurg

Associate, Load Controls

3 What issues have you seen with material shortages or supply chain issues?

Initially, supply chain was impacted by COVID and deliveries by sea freight could take six to seven weeks versus three to four weeks normally. The situation improved toward the end of 2020 and into early 2021. But now, with the harbor issues everywhere, we are back into that very long time for sea freight. Also, with more travelers on the airlines and also more companies switching to air freight due to poor sea freight, normally one to two weeks is now three to five weeks by air.

Todd Loudin

Head of Neles USA Inc. Maryland Flowrox Business,
Head of Sales & Service North & South America
Mining & Metals Flowrox Business

Logistics is the single largest global impact today and it has significance on both sides of the product value chain. From vendor delays to customer challenges in getting goods on the sea, planning your business has never been more important and your ability to optimize plans has never been more tested and on display.

Tamara Morytko

President, Flowserve, Pumps Division

It feels like the phrase of 2021 has been "it's on a boat somewhere!" We've had to adjust to our customary suppliers having issues getting many of the parts we need for our controls. Part of the adjustment has been seeking out additional suppliers, many of whom have smaller quantities at much higher prices. Fortunately, we've been able to meet our customers' demands so far, but it has been a wild year.

Michael McClurg

Associate, Load Controls

Companies need to be creative when dealing with material shortages and supply chain delays. In one case, our vendor notified us that our order of motor bobbins was stuck in a container ship outside the port of Long Beach, [California]. Lead times for the motor bobbin usually is three to four weeks. Our vendor informed us that it could take over six months to receive our delivery. We decided to make our motor bobbins in-house to meet customer demands. Our team quickly made tooling and began manufacturing motor bobbins. The best part is our customers never even noticed a difference in lead time for the pumps they ordered. This is one example of many similar situations. I believe the "make it yourself" mindset has worked to our benefit during these times. I am proud of how resilient our team is. Manufacturers need to think differently about how to handle long lead times and shortages of goods. As the saying goes, necessity is the mother of invention!

Rob Gledhill

CEO, Blue-White

Blue-White®



**CHEM-FEED®
CD1**



**FLEXFLO®
A1F**

Dose PAA & Sodium Hypochlorite with No Vapor Lock, No Lost Prime.

Peristaltic or Diaphragm Pumps for Precise Chemical Feed.

Blue-White® is ISO 9001:2015 Certified

Blue-White®

www.blue-white.com • 714-893-8529
5300 Business Dr., Huntington Beach, CA 92649 USA • info@blue-white.com



Made in USA

Check 107 on index.

QUESTION #3
CONTINUED:

Almost every material/commodity from steel, casting, elastomers, engines, paints, motors, bearing[s], to name a few, have had numerous price increases, and delays in shipment are as high as 44 weeks.

Tony Chirico
National Sales Manager, Gorman-Rupp

We have seen material shortages and logistical challenges through our entire supply chain on a daily basis. We expect those challenges to continue well into 2022 but eventually forces of supply and demand will prevail sometime in late 2022.

Steve Everton
President, Pioneer Pump
(Franklin Electric)

[The now approved] infrastructure investment of \$55 billion for WWW [water/wastewater] has the potential to truly change the industry. Supply chain issues pose a threat to future infrastructure projects, just like the challenges we are facing on current projects. Many manufacturers recognize this, making investments in local manufacturing—whether to increase capacity in existing factories or to build new facilities. Schneider Electric, for example, recently announced plans to invest more than \$100 million to increase regional capacity, including plans to open three new manufacturing plants in North America.

Ujwal Sareen
Business Development Manager for the Pump and Compressor Segment, Schneider Electric

In the case of material issues, we have been forced to procure larger quantities of specific materials to reduce lead times as well as overall availability of materials. Supply chain issues have created a deeper look into more refined scheduling. As well, a broader reach of multiple suppliers for various products.

Taylor Smith
Operations Manager, Vaughan Company

4 What needs to happen in regards to industry improvements?

Advancing global cybersecurity standards and efficiency calculations will help drive the industry forward. Clear guidelines and expectations around cybersecurity, particularly for industrial sites. Industrial fieldbus is applied differently than residential or commercial applications, so a one-size-fits-all approach does not always make sense. Efficiency calculations and standards that reflect the contribution or performance of each component in a pump system, so customers can pick and choose the optimum combination for their application.

Charles Tahara
Marketing Director, Industrial Control Division, Eaton

We have seen strong innovation in recent years as digitization and connected products have changed the way pumps and machines operate and the data operators can gain from their operations. As we look to continue improving those operations—both for uptime and energy efficiency—we need to embrace new platforms, like universal automation. By moving past limitations, like vendor lock-in and integration costs, we are able to gain access to new technology and integrate it into our existing operations faster and easier while still managing the bottom line.

Ujwal Sareen
Business Development Manager for the Pump and Compressor Segment, Schneider Electric

In the short run, the industry needs to get our supply train back on track. Predictable and reasonable equipment availability—even for the most basic commodity items—remains elusive and is to the detriment of our customers and the economy at large. While not unique to our industry, these challenges are felt acutely as pumps and related equipment are so central to many customers' operations. In the longer term, the industry needs to continue and improve its leverage of IIoT [industrial internet of things] and similar technologies to improve both reliability and efficiency of operations.

Christopher S. Brown
President, Geiger Pump & Equipment Company

Most critical for Inpro/Seal has been the attraction and retention of manufacturing workers. Even before the labor market contracted in 2020, it was difficult finding skilled labor to work in the manufacturing process. We need to come together as an industry to bring excitement to the manufacturing industry so that talented individuals will not only want to work in manufacturing but see a career path to support themselves and their families.

Mick Corrie
Vice President and General Manager, Inpro/Seal

The largest need affecting every area is employment. We are in need of workers. Employment has slowed the off-loading of cargo ships, affected truckers, locations at terminals are at capacity, shortages upon receipt, quality and the escalation of pricing.

Tony Chirico
National Sales Manager, Gorman-Rupp

5 What keeps you up at night?

The supply chain train is trying to get out of the station from the pandemic but it's struggling. We're in constant communication with our suppliers so that we make sure we don't get a call overnight that says there's a problem. We want to work with them. And same thing for us with our customers. It's always better to know "I'm going to have a problem" than "the problem is already here" or "oh, by the way, it was last week." I think [the supply chain is] going to be a problem that stays with us for some time.

Joe Johnston
Vice President, Water Infrastructure
North America, Xylem

Retention of our precious talent combined with the ability to attract new and capable talent.

John Wilson
President, Industrial Flow Solutions

The thought of industry innovation slowing down due to distractions caused by the current supply chain challenges.

Rob Gledhill
CEO, Blue-White

Getting the right talent in the right position to succeed and thrive throughout the organization. Creating a culture where passion, purpose and persistence around a common set of objectives sets the tone every day. Getting this right attracts talent that makes navigating a global pandemic and the related supply chain environment look more like an opportunity than an obstacle.

Steve Everton
President, Pioneer Pump
(Franklin Electric)

The health and well-being of our employees keeps me up at night. People have been asked to engage in new ways, deliver at a faster pace and redefine success in pivotal ways like never before. The pandemic has taken an emotional and mental toll on everyone and each person's "reality" is different and equally important to value and embrace. We ask more and more of our employees and are driving company cultures from afar more than ever. The pure mental gymnastics that everyone must play to be seen, heard and impactful can be exhausting. We continue to raise the bar on our employee check-ins, open discussions and collective involvement on the pathways forward and how it is impacting each person, their role and their ability to feel connected and contributing in a valuable way. Is it enough? Is there another way to engage? How long can this constant cycle of change go on and how can we keep our people energized, refreshed and actively engaged with their hearts and minds? Time will tell but until then the nights will continue to be restless for leaders who care for their people.

Tamara Morytko
President, Flowserve, Pumps Division

Innovative Packaged Solutions for Your Most Challenging HVAC Applications

wilo®

WEIL
PUMP
A WILLO BRAND

AMERICAN-MARSH PUMPS
A WILLO BRAND

Scot Pump
A WILLO BRAND

QuantumFlo
A WILLO BRAND

One Company, **Five Great Brands!**



Visit us at
AHR 2022
Booth C2929



Check 109 on index.

STATE OF THE INDUSTRY 2022

How M&A Activity Impacted the Pumps Industry in 2021

Mergers and acquisitions expert explores what's ahead for pump companies in 2022.

THOMAS HAAN | Global Equity Consulting

The mergers and acquisitions (M&A) activity in general, and specifically in the fluid handling industry, were at record levels in 2021, and 2022 is expected to be an active year. Valuations were at strong levels in 2021, but there could be some compression in 2022.

In Images 1 and 2, the line graphs indicate the number of completed transactions in a given period. The dots above Q4 2020 and Q1, Q2 and Q3 2021 indicate PitchBook's estimated number of completed transactions after the actual data for those periods is available.

The number of transactions is a better barometer of M&A activity since the total value of transactions is impacted by multiple factors related to the mix of activity such as industries, deal size and difference in valuations between the periods. Focusing on the number of transactions, M&A activity slowed in 2020 particularly in Q2 and Q3 in North America before turning up in Q4 2020. The high level of activity continued through 2021.

Multiple factors are driving the current high level of M&A activity, and many of those factors will likely continue to drive a high level of M&A activity in 2022. On the demand side, many strategic buyers are looking to take advantage of the current low cost of debt and a high level of liquidity to pursue various objectives including growth opportunities, vertical integration, realignment of their portfolios, expansion of technology, and response to evolving customer needs and wants. Private equity buyers are driven to put record amounts of capital to work, so they are looking for new platform business as well as add-ons to existing platforms. On the supply

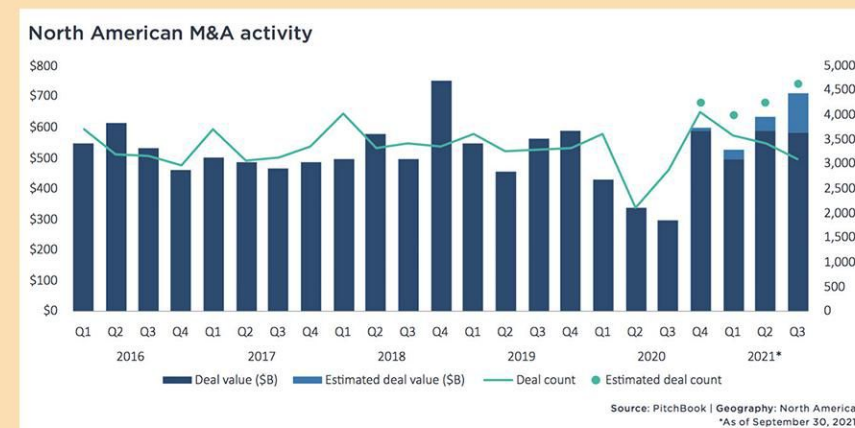


IMAGE 1: North American M&A activity 2016 through Q3 2021 (Image courtesy of PitchBook)



IMAGE 2: European M&A activity 2016 through Q3 2021 (Image courtesy of PitchBook)

side, some strategic sellers are looking to take advantage of the strong valuation environment to realign their portfolios.

Private equity and private business owners are taking advantage of the strong valuations to exit—or in some cases to go public. Certainly, the potential change in capital gains tax levels is an additional motivation, particularly for private business owners.

Valuations Remain at High Levels

These multiples tend to be skewed toward the high end because the financial terms for smaller and private transactions are frequently not disclosed so the database tends to be larger, public transactions. However, the trend is indicative of the market situation: Valuations dipped substantially following the 2008 financial crisis, bounced back and remained fairly

consistent from 2010 to 2014 before stepping up in 2016 and remaining at that relatively high level from 2016 to 2021 (Q3).

A different look at valuation from GF Data shows multiples for private equity transactions. These are smaller-company, private transactions, and the multiples are substantially lower than the larger public company value multiples, but the trend is consistent: The M&A market remains a seller's market as demonstrated by strong valuation multiples over the last five years, especially in the larger segments.

There is also a quality premium for companies with at least 10% per year sales growth and 10% earnings before interest, tax, depreciation and amortization (EBITDA) margin. In addition to the strong multiples, buyers have been rewarding companies with above-average characteristics with an increasing quality premium.

The valuation of any business is specific to a seller and a buyer, but there are fundamental factors that have a significant impact on valuations including:

- market demand for a specific acquisition
- potential synergies
- outlook for growth
- cost of capital

It does appear the demand for quality acquisitions is not likely to subside in the near term. However, should the outlook for growth and/or the cost of capital be negatively impacted by inflation, supply constraints or other factors, there could be compression in valuation multiples—the timing of any compression in multiples would depend on when and to what degree those negative factors become significant.

M&A Activity at Record Levels

2021 was the most active year for M&A activity in the fluid handling industry in the last five years. In fact, it was the most active year in the past 10 years. The factors

Fluid Handling Industry Transaction Activity				
2017	2018	2019	2020	2021 (estimated)
54	67	71	69	97

IMAGE 4: Fluid handling industry M&A activity 2017-2021 (Image courtesy of Global Equity Consulting)

Fluid Handling Industry Targeted End-Use Markets		
End-Use Market	Number of Transactions*	Percentage
Diversified (serves multiple end-use markets)	37	49%
Water	20	26%
Hygienic (food and beverage, pharma, etc.)	6	8%
Oil & Gas	3	4%
Other (single market focus not otherwise classified)	10	13%
Total	76	100%
*Q3 2021		

IMAGE 3: Most targeted end-use markets. (Image courtesy of Global Equity Consulting)

driving this level of activity are the same as those driving the general M&A market activity, namely:

- growth opportunities: additional geography, expanding addressable market, etc.
- expanding technology: addressing evolving market needs and wants, e.g., asset monitoring, predictive maintenance
- integrating channels: mostly forward integration of distribution and service partners
- realigning portfolios (strategics)
- need to put capital to work (private equity)
- monetizing value creation (private equity and private business owners)
- retirement (private business owners)

However, while the activity level is strong, it is also rather concentrated in that 14 companies accounted for 65% of the activity in 2021 (through Q3 2021).

Water Most Targeted End-Use Market

Water has been the most targeted end-use market over the last few years, replacing oil and gas. Hygienic is showing up for

the first time with enough transactions to be a stand-alone category—this appears to be a trend.

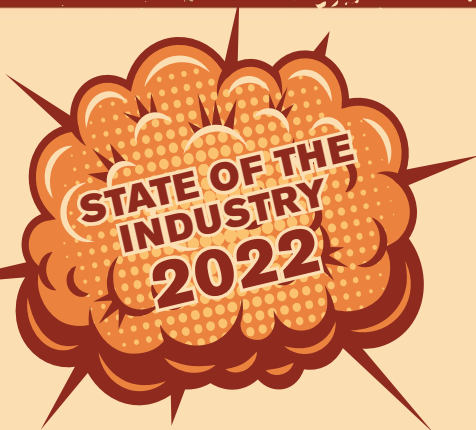
Thoughts About 2022 M&A

The factors mentioned earlier in the article that have been driving the demand for quality acquisitions in the industry in recent years are not likely to change significantly in 2022, barring a disruption such as experienced with the COVID-19 pandemic.

Likewise, the factors motivating potential sellers are also not foreseen to change significantly in 2022, with the possible exception that the uncertainty around the potential change in the United States capital gains tax could be clarified. There is also potential for compression in valuation multiples should the outlook for economic growth and interest rates become material headwinds in the U.S. and/or Europe.

Not all transactions are highly competitive and there are excellent opportunities for companies to grow through acquisition. However, chances are it will take a purposeful outreach program to identify those opportunities and build the relationships that lead to those opportunities. ■

Thomas Haan is an operating director with investment banking firm City Capital Advisors and principal of Global Equity Consulting. He can be reached at thaan@globalequityconsulting.net or 269-547-0434. For more information, visit city-cap.com or globalequityconsulting.net.



What Does Buy American Mean for the Pump Industry?

The Hydraulic Institute is working to ensure current waivers and exemptions remain in place.

JENNIFER KING | Pumps & Systems

Impellers and casings. You can't make a pump without them, right?

Hopefully, pump manufacturers won't have to face that challenge as the requirements become stricter for Made in America components for projects funded with federal dollars.

In July, the Biden administration announced it would take the domestic content threshold from 55% to 60%, with a phased increase to 75% by 2029. Thus, the value of the U.S. component parts used in any federally funded project must be at 60% today. Then the Build America, Buy America section of the Infrastructure Investment and Jobs Act introduced strong language on forced localization, including eliminating the American iron and steel exemptions for pumps under Environmental Protection Agency/U.S. Department of Agriculture (EPA/USDA) revolving funds.

The issue is, as Michael Michaud, executive director of the Hydraulic Institute, explained recently, the vast majority of clean water centrifugal pumps are made with casings and impellers that are forged overseas. Even if the pumps themselves and additional components are engineered or manufactured in America, pump manufacturers are reliant on international supply chains.

Long ago, North American-based pump manufacturers had to offshore items like casings and impellers due to costs, access to raw materials, and because the work is not environmentally friendly so it was more difficult to do in the U.S., Michaud said.

"Biden's Executive Order raised the requirement for U.S. components and is being integrated into new legislation that focuses on federal spending," Michaud said.

In the past, projects funded with federal dollars—including federally financed water or wastewater projects—allowed exemptions or waivers. Water and wastewater project exemptions were created in the 2009 American Iron and Steel Act, which applies to projects funded by the EPA. If a project receives even a small fraction of federal funding through the State Revolving Fund (SRF) or other federal financing mechanisms, the content restrictions can apply to the whole project.

Now, however, those waivers are being tightened under the Biden administration's new directive, spending bills and coordinated under the newly formed Made in America office.

"The reality is that we live in a global economy, so we need to strike a balance with this strict Buy American language and what we need to do to invest in improving our critical infrastructure," said Hydraulic Institute Vice President of Governmental Affairs Mark Chaffee.

Chaffee recently met with the U.S. Secretary of Commerce Gina Raimondo and Celeste Drake, the director of the Made in America office.

"The current component test for Buy American is strictly the percentage of foreign material based on price. There's no consideration for value added by the American workers," said Chaffee, who is also vice president of governmental affairs and C&I product management for Taco Comfort Solutions. "From Taco's standpoint, we're determined to protect and grow the over 500 manufacturing jobs we have in the U.S. However, to keep those jobs we have no choice but to source globally. We believe there should be some consideration

to the value added by the American worker, and there's not. That's probably the biggest ask—for a change in the way the component test is calculated. We believe it benefits us all."

The recently approved \$1.2 trillion infrastructure investment will drive billions of dollars to fund water and wastewater projects, Michaud said. However, if pumps, which are made in America but with some components from overseas, are not allowed due to the new restrictions, it will limit the number of projects or cause significant delays in the project completion. There are lots of wrench-ready projects that include installing more energy-efficient pumps. Delaying or excluding those projects would also hurt the administration's climate change agenda, Michaud added.

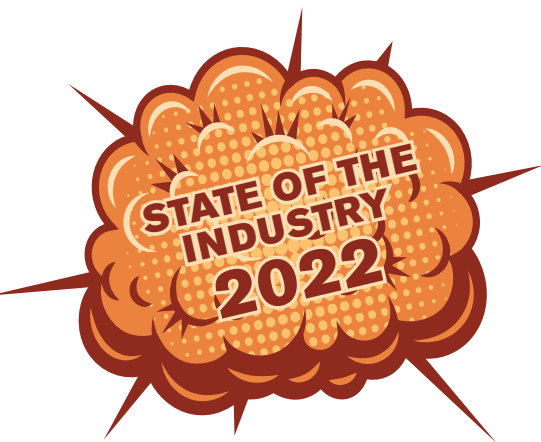
The timing factor is critical, as the 60% threshold went into effect immediately and the administration is trying to get the infrastructure money out quickly.

"Long gone is the idea of a vertical, U.S.-only based supply chain," Michaud said. "Most casings and impellers come in from overseas—they are globally sourced and completely integrated into the pumping system once they arrive here in the U.S."

The Hydraulic Institute is pursuing a strategy to educate policymakers on the need for a global supply chain and the value of maintaining the current waivers and exemptions that are in place.

"We're not anti-Buy American," Michaud said. "We are American manufacturers with complex global supply chains." ■

Jennifer King is editor of Pumps & Systems magazine. She may be reached at jdking@cahabamedia.com.



A Look at the Shifting Global Trade Paradigm

Economist Chris Angle and pump industry expert Tom Angle weigh in with a global perspective on supply chain disruptions and predictions for 2022.

CHRIS ANGLE & TOM ANGLE

As another year is coming to an end, the global economy faces major challenges. What is clear after nearly two years is the pandemic and the response to it are provoking socioeconomic adjustments that may be felt for years, if not decades. It is increasingly probable that we are living through a transitory period in history such as World War I where what comes after is markedly different than what came before. The hope that the adoption and distribution of the vaccines would allow a quick return to conditions that existed in 2019 appears to have been overly optimistic.

One of the major global economic disruptions is the supply chain crisis. While there is ample commentary regarding what has caused it and how to fix it, much of what is written does not fully appreciate the complexity of the global logistical system. As someone who used to manage multiple air freight shipments in transit involving multiple companies, I (Chris) can say that one mistake can cascade through the system like dominos and create chaos.

Conversations with members of the European pump industry reveal consistent themes regarding what is causing the crisis:

1. Suppliers of parts overestimated the decrease in demand that would be caused by the pandemic and reduced productive capacity too much. They failed to foresee or appreciate the impact of government income support to businesses and individuals.
2. Suppliers are struggling to ramp up capacity to meet current demand.
3. Policy reactions to COVID-19 and income support to individuals have reduced the pool of available labor (especially skilled labor) such as

truck drivers and port workers.

4. Layoffs and uncertainty led many workers in Western Europe from Eastern European countries to return home. COVID-19 vaccination certification differences and border crossing rules are causing many to not return.
5. China reducing production of strategic materials and/or deliberately reducing sales to the West is driving up prices.
6. Estimates of time needed to return to normal are one to three years.

The consensus in the European pump industry is that, economically, 2021 was better than 2020, but the outlook for 2022 is troubling for several reasons.

- Order books may be full, but critical parts with no substitute can't be obtained and product can't go out.
- When an unavailable part can be substituted, the purchasing, engineering and administrative effort can be overwhelming.
- Significant price increases of scarce commodities are cutting into margins.
- Many energy prices have jumped significantly in the past few months.
- A feeling of concern exists among customers and won't go away quickly.

The supply chain crisis is showing the limits of the "Just In Time" manufacturing model as practiced over the last 25 to 30 years. Today, we have a major breakdown in the global logistics system, which is causing shortages in stores, rising transportation costs and contributing to the inflationary environment. Contacts inside the freight transportation industry have indicated that traffic is so snarled that it

will take the better part of another year to get sorted out—at a bare minimum.

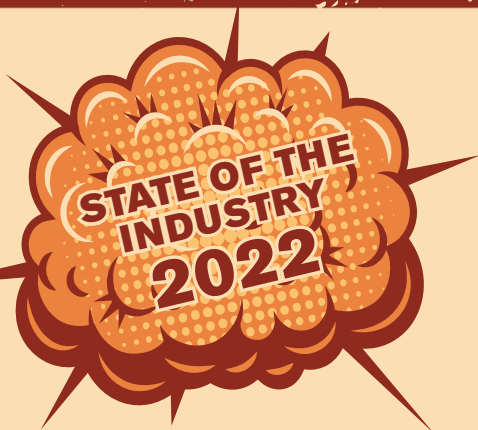
Given the apparently deliberate withholding of supplies by China, manufacturers may move to shorten supply chains and increase flexibility. The globalization process that has been in place over the last 60 years will not be dismantled, but this is likely the beginning of a reversal and modification.

Finally, despite reassuring words from several United States policymakers, inflation seems to be rising and embedding itself into the system. One impact could be a deterioration in the value of the U.S. dollar, thereby making U.S. exports cheaper. However, other countries reliant on exports to grow, such as European economies, are likely to respond by weakening their own currencies. In addition, inflationary pressures on the U.S. dollar are contributing to the increase in oil prices, which will result in a drag on U.S. economic growth in the short to medium term.

In conclusion, aside from the financial crisis of 2007-2009, the global economic and political system over the last 40 years has been relatively stable compared to other historical periods. We have come to think of this stability as the norm. The pandemic has made the last year and a half bumpy, as most paradigm shifts are. 2022 is likely to continue to be bumpy. ■

Chris Angle is a commercial banker who analyzes businesses and structuring credit facilities. Angle earned a bachelor's degree in international relations from the University of California-Davis and a master's degree in international economics and finance from Brandeis University.

Tom Angle, P.E., MSC is Geschäftsleiter (CEO) of Swiss Flow Solutions GmbH and a Pumps & Systems Editorial Advisory Board member.



Industry Associations Plan for 2022

EASA, FSA, HI, SWPA and the Texas A&M Labs share what users can look forward to in the year ahead.

1 EASA

EASA is the international trade association representing the electromechanical repair, service and sales industry (e.g., pumps, electric motors, drives, controls, etc.). EASA's on-point theme for 2021-22 is RECALIBRATE | REALIGN | REFOCUS.

Among the association's many benefits, members can consult directly on technical issues with six world-class engineers, including a pump and vibration specialist.

EASA is offering a variety of in-person seminars in 2022, including Fundamentals of Pump Repair, Principles of Medium and Large AC Motors, Root Cause Failure Analysis and more. In addition, EASA continues to offer free webinars to its members each month, which are available to nonmembers at a nominal cost. Visit easa.com/training for this technical lineup.

The EASA Convention & Solutions Expo will offer targeted education options. The Solutions Expo will be held June 26-28 at America's Center in St. Louis, Missouri. Pre-convention education on June 25 will feature four sessions on pump topics. Visit easa.com/convention for updates.

Among EASA's initiatives for 2022 will be a more streamlined way to search the resources included with membership at easa.com, making it easier for members to onboard and train employees. The association will also introduce additional information and resources regarding IIoT at its online emerging technologies portal.

Training is always a major focus for EASA, and in 2022, the association will develop short "how-to" videos to help members train employees.

2 The Fluid Sealing Association

The Fluid Sealing Association (FSA), founded in 1933, is an international trade association of member companies that are involved in the design, production and marketing of a wide range of fluid sealing devices, including mechanical seals, expansion joints, gaskets and packing.

FSA is focused on current events and challenges within the industry. It has been an advocate for methane emission reduction through improved detection and technology and will do so going forward as this topic regains priority in 2022.

The organization is actively working on both sides of the aisle in Congress to provide clarity regarding a category of chemicals known collectively as perfluoroalkyl and polyfluoroalkyl substances (PFAS). Concerns about these "forever chemicals" and their potential carcinogenic characteristics have created tremendous awareness and a desire to aggressively restrict their use.

While FSA strongly supports the management of all hazardous chemicals, not every member in this group is hazardous. For example, PTFE is a widely used, nonhazardous member. The unique properties of PTFE have critical use throughout the industrial, medical and aerospace markets as a sealing material, often being the only viable option in systems that protect the environment.

FSA will continue to support and provide fact-based education on this topic in 2022 to better distinguish between hazardous and nonhazardous members of the PFAS family to avoid the inadvertent banning of nonhazardous chemicals that offer critical capabilities for sealing systems globally.

3 Hydraulic Institute

At the beginning of the pandemic, the Hydraulic Institute (HI) quickly shifted its training to virtual offerings. This enabled HI to continue to serve operators. While HI will return to some face-to-face training and events in 2022, it will also continue to offer virtual courses and webinars and expand its digital footprint.

Basic Training, once a member service offering on-demand webinars on pump, component and system topics, is now available for any company to share. Think Netflix but with pumps content. The Engineering Data Library is a free reference for everything from pump fundamentals to system curves to fluid properties to friction loss calculators. The Energy Efficiency toolkit has more calculators, databases and other resources for utilities seeking to develop more efficiency rebate programs.

The last piece of the puzzle falls into place in early 2022 and connects all of these resources. The new pumps.org will link tools with case studies providing additional context for the user. All materials will sit on a training portal for individual and corporate users. The new pumps.org will strengthen HI's online presence, help share its resources and become the go-to for critical pump knowledge.

HI will be back to scheduling public courses and hosting live meetings to bring the industry together to network, solve problems, and continue to do the work of developing standards and mapping training curricula for the industry. One initiative the organization is excited about is a joint project with SWPA where both organizations will present a two-day, combined training event June 23-24 in Columbus, Ohio.

All the talk in the news and Washington these past few months about the \$1.2 trillion infrastructure package has helped shine a spotlight on water infrastructure. The industry is a critical, yet hidden, component of infrastructure.

The younger generation entering the workforce is concerned about finding a rewarding and meaningful career. HI will be working hard to come out from behind the scenes to be more visible so the industry's important contributions are recognized. Students looking for a career need to know more about the opportunities that working with pumping systems offer. They need to see how the industry is working to solve some of the world's biggest challenges around water and energy.

HI will be focusing on the entire workforce pipeline—bringing more people into the industry, providing opportunities to learn, upskill and grow in the industry, and develop a rewarding career.

4 The Submersible Wastewater Pump Association

"In 2021, SWPA successfully expanded its live training to virtual training in response to COVID-19 and the industry's need for training despite travel restrictions," said SWPA Executive Director Adam Stolberg.

In collaboration with Pumps & Systems, SWPA University was launched and included a fall and spring 10-week virtual classroom. Taught by industry experts and SWPA members, classes were held for one hour per week on a host of topics that included training on both pumping and controls systems, as well as addressing today's industry issues, from managing major storm events to nonflushable consumer products and how to eliminate clogging.

SWPA University also offers an on-demand program where professionals can train online on their own timeline. Participants receive the "Submersible Pumping Systems Handbook, 4th Edition," as well as SWPA's Start Up and Tuning Manual. Certificates of completion were issued by SWPA that allowed participants to earn up to 10 hours of CEU credits.

"In fulfilling their mission to enhance the global wastewater environment by

informing, educating and providing leadership in the design, procurement and operation of submersible wastewater pumping systems, SWPA will continue with a broad-based educational platform in 2022," Stolberg said.

SWPA University's spring session will begin March 1 and will run for 10 weeks. The fall semester will begin Sept. 6.

SWPA's Pumping Systems and Controls Training two-day live program will be offered April 19-20 in Chicago. "We were unable to hold our annual training for the first time in over 25 years due to COVID-19," Stolberg said. "I'm getting lots of inquiries about when the SWPA training will be back, so I'm excited.

"In SWPA's effort to bring top-level education and training, as well as timely and updated programming, to the wastewater industry, we will expand our live training program by partnering with the Hydraulic Institute. SWPA and HI will hold a joint training event on June 23-24 in Columbus, Ohio," Stolberg said.

For information on SWPA training, meeting schedules or membership information, please contact Adam Stolberg at swpaexdir@sbcglobal.net or SWPA's website at swpa.org.

5 Texas A&M Turbomachinery Laboratory Expansion Programs

The Texas A&M Engineering Experiment Station (TEES) Turbomachinery Laboratory (TL) is entering its 50th year of serving government and industry through research, education and workforce development.

The TL mission remains identifying research areas critical to economic development, leadership and quality of life. Educating future leaders is its primary product as the organization develops talented students through basic and applied research programs under three thematic areas: rotordynamics and mechanical systems; thermal fluids and combustion; and computational modeling and design.

Combustion- and propulsion-related research has become an emphasis in recent years within the college of engineering at Texas A&M and offers to be a dynamic and growing opportunity for our various programs within the Turbo Lab. For example,

the college has hired several new faculty members in these areas.

With strong support from the university, TL is preparing to break ground for a new facility dedicated to propulsion and energetics, adding capabilities for high-pressure research and testing in a safe environment, providing unique infrastructure for existing and new members of the TL faculty across all three thematic areas.

While it continues to work closely with the oil, gas and petrochemical industries, emerging opportunities in the power, water, energy, aerospace and space industries will be addressed through this expansion.

Additionally, it will be expanding its Turbomachinery Research Consortium, with 30-plus industry members funding research in rotordynamics and mechanical systems. TRC-2 will focus on the other two thematic areas, thermal fluids and combustion, and computational modeling and design, while still maintaining its core focus in TRC, now approaching its 40th year.

Workforce development programs that include the venerable Turbomachinery and Pump Symposia (annually in Houston, Texas) and the Asia Turbomachinery and Pump Symposium (biennially in Kuala Lumpur starting May 2022) continue on the path for growth. Developing multiday short courses for professional continuing education also is an expansion area for TL.

In short, the Turbo Lab will continue to maintain and expand its core activities in rotating equipment systems while growing its reach into other industries that are important for future growth and synergy with a number of efforts across campus.

The main product of all of these activities will always be "Engineers Ready to Work" as we educate the future workforce and continue to provide important programs for the current workforce. ■

Get More Info



Read more State of the Industry coverage:
pumpsandsystems.com/tags/SOTI2022