

Port Bureau News

Quarter One / 2023



The Importance
of Collaboration in
the Physical and
Cybersecurity Threat
Landscape

Also in this Issue: Captain's Corner | Port Watch | NOAA | Federal Reserve Bank of Dallas | Observations on the Proposed Draft Guidance for Nationally Consistent Coastal Zone Area Contingency Plan | EIA - Short Term Energy Outlook | Commerce Club |



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Captain's Corner

This Year – and Ten Years from Now



Photo courtesy of Port Houston.

The great architect Frank Lloyd Wright was a visionary leader who was committed to his ideas. He felt the U.S. was unique and needed its architecture to reflect and celebrate its character. He also believed in focusing on the future, saying an “architect must be a prophet ... if he can't see ten years ahead, don't call him an architect”. Wright complemented his innovation with commitment, believing a critical part of success was “unremitting devotion to the things you want to see happen”. Because of this, his creations became celebrated as the first truly American architecture.

His ideas apply to us as port leaders. Our own local maritime history shows that those before us looked ahead to see a world class port in a 10-foot bayou—and made it happen. Like Wright, they believed a structure should complement its environment and function. These same qualities are as important now, in 2023, as they were in the past. We have the chance to make a difference in what our port will be this year – and ten years from now – by being willing to look ahead and by strengthening our commitment to being a world class port.

Our Houston maritime industry has big projects underway, with more on the cusp of formation that we want to see happen. The biggest project in progress is Project 11 – the deepening and widening of the Houston Ship Channel. While work on the Galveston Bay Reach has been in progress for a little over a year, more “looking ahead” needs to be done to accomplish the locally preferred plan of seeing the full Houston Ship Channel ready for the vessels that will be calling in sooner than ten years.

Coastal protection is another significant component of our maritime infrastructure. Its potential impact, size, and cost are daunting, but we have an important opportunity to make a difference. As officials and engineers consider how to protect our region from natural disasters, we

need to actively engage as thought leaders to achieve projects that not only protect our communities, but also the maritime interests that are the backbone of our economy. We need to look ahead to ensure concepts such as a gate system in Galveston and the proposed flood tunnels in Houston, work with – and not against – our Houston Ship Channel.

As important as our physical infrastructure is, port call optimization and digitalization should share equally in our vision. This is a global topic throughout the maritime industry. Digital transformation of port processes gives stakeholders real-time situational awareness of all the events taking place during a vessel call. It impacts the entire supply chain, and it will be pivotal for cost-efficiency and meeting environmental and emission goals of the near future.

How advocacy takes place may vary from person to person, but one thing is certain. It requires a steadfast commitment to staying informed and staying involved. The Port Bureau's mission is to help you do just that. We have a “unremitting devotion” to collaboration in the maritime community, bringing together competitive partners for the betterment of the port region, and bringing you the information you need for informed business decisions. Your participation in the port community through membership with the Port Bureau and your engagement with fellow stakeholders will make a difference in what the port of tomorrow looks like and the success it generates in our region, our state, and our country.

We may not be changing the landscape of the U.S. architectural design world, but Frank Lloyd Wright's words ring true because what we are doing is just as big. One way or another, we will be changing the landscape of the port region. What we do today does make a difference for tomorrow. Join the Port Bureau in “looking ahead” in 2023. **Be committed. Be an advocate. See it happen.**

Bill

CAPT Bill Diehl
USCG (Ret.), P.E.
GHPB President



Letter from the Chairman



It is my honor to serve the Houston port region through my work as chairman of the Greater Houston Port Bureau. Since its founding in 1928, the Port Bureau has been committed to advancing progress and prosperity in the Houston Ship Channel community through facilitating collaborative networking, providing maritime information and data, and championing advocacy for port progress and prosperity. Our membership has grown significantly over the past several years to more than 260 company members today, representing 50 different industry segments in the region.

As part of the goals established in the Port Bureau's strategic plan, we leaned forward on advocacy, networking events, and port digitalization during the last year. We launched the PilotTracker platform for real-time pilot dispatch information with our partners at PortXchange and the Houston Pilots. PilotTracker replaced our long-standing Harborlights program and represented an important step in improving port efficiency through digitalization. The successful launch of PilotTracker also represents the continuing work of the Port Bureau's Efficiency Committee as they explore methodologies to maximize the efficiency of vessels transiting the Houston Ship Channel. The continued partnership with PortXchange also led to co-developing the Synchronizer, a platform used to optimally plan, execute and monitor all activities during a port call on standardized data exchange.

Our Advocacy Committee continued in strong support for Project 11, which kicked off last summer. We also started looking toward the next big project for our area, the Gulf Coast District Project, also known as the "Ike Dike" or the Coastal Spine. In 2022, our members proactively conducted a navigation study of this project's preliminary Bolivar Roads gate system design. Our next step will be to work collaboratively with the Gulf Coast Protection District and the Army Corps of Engineers to advocate for a final design that both protects our citizens and cities, while enabling sustained growth for maritime commerce well into the future.

In 2022, the Port Bureau Outreach Committee added the Women in Maritime Happy Hour to our networking event roster. These were great events that supported and celebrated the diversity in our maritime community. We hosted a few events and are working on our next event scheduled for April 3, 2023. Also, in collaboration with Houston Maritime Center ("HMC"), the Committee helped create a "Port 101 video/program" with CAPT Diehl as spokesperson. The HMC will be going into middle school classrooms to help educate and encourage students to enter the maritime field.

Last year one of our Commerce Club speakers said what he appreciated most about the Houston port region is its "Texas attitude" for problem-solving in an efficient way. I urge you all to bring that "Texas attitude" to the Port Bureau and get more involved as we keep making the port even better for everyone in 2023.

Thank you for your support of, and participation with, the Greater Houston Port Bureau. We are a vibrant, member driven organization, sharing a passion for the current well-being and future growth of the Houston Ship Channel community. I look forward to another great year for our port and all of us who work along the Houston Ship Channel.

Sincerely,

Bernt A. Netland
Chairman, Greater Houston Port Bureau



The Importance of Collaboration in the Physical and Cybersecurity Threat Landscape



Texas is home to some of the busiest and most important maritime ports and terminals in the United States. From the east ports through the southern ports of Texas, these facilities play a vital role in the state's economy and the country's supply chain. They handle a wide range of cargo, including oil, natural gas, chemicals, and other goods.

As with any critical infrastructure, the security of these ports and terminals is of utmost importance. In recent years, there has been an increased focus on both cybersecurity and physical security at these facilities.

Great strides have been made in technologies that our Houston area has adopted and embraced. This has aided and streamlined everything from operational awareness, business intelligence and analytics, including how both physical security and information technology and automation systems have become more intertwined and converged. The speed at which we, as an industry, have adopted and deployed new technologies in our facilities far outpaces the speed in which elements of cyber-informed engineering was considered at the Front-End Engineering Designs ("FEED"). This in itself has created some hybrid vulnerabilities that can be complex when using systems that are insecure by design. Much of this can be attributed to backwards compatibility but even more so with the integration to external environments such as cloud computing and other third-party services that create vectors of unverified trust into a plant or port's operations.

Ports and terminals are vulnerable to cyberattacks, which can disrupt operations and have serious economic consequences. On December 25, Christmas Day, the Port of Lisbon (Porto de Lisboa) was the target of a ransomware attack claimed by the LockBit gang. LockBit is a ransomware gang that has been active since at least 2019. The group is known for using ransomware to encrypt the data of victim organizations and demanding payment in exchange for the decryption key. The group has targeted a wide range of organizations, including healthcare providers, local governments, and schools. There is limited information available about the individuals behind the LockBit gang, and it is not clear where they are based. The Port of Lisbon confirmed that the cyberattack did not compromise operational activity. LockBit has laid claim that they have stolen financial reports, audits, budgets, cargo and crew details, emails, and personally identifiable information ("PII"), while threatening to publish this data if not paid the \$1.5 million in currency.

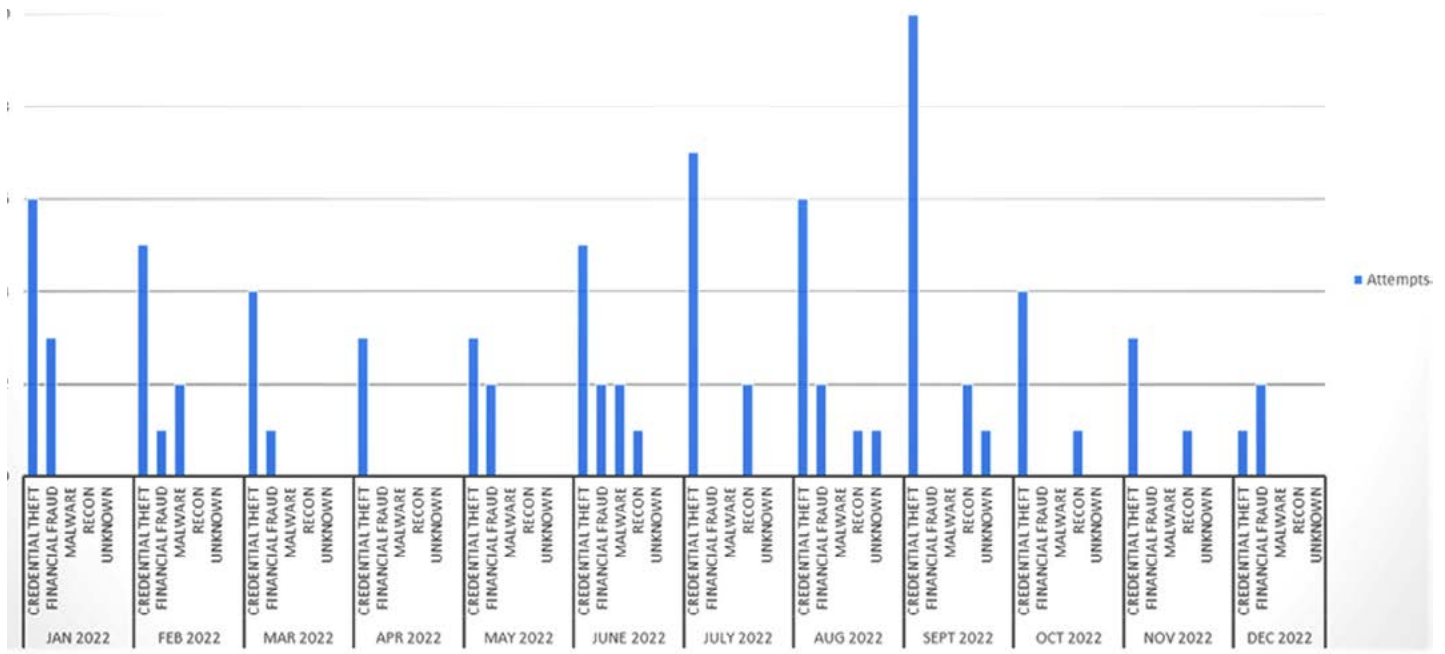
In August of 2021, Port Houston quickly identified an attempted intrusion into their business systems and were able to isolate the system while working with their security vendors and local federal agencies. The attempt used what is known as a zero-day exploit which is an undocumented or publicly known vulnerability in software and hardware in which detection algorithms or patches do not exist for the vulnerability. It is very important to note that Port Houston was lucky that they took the anomaly they had

and questioned it while confirming and escalating, then pulling the plug on the adversary’s attempt. It could have been missed as per a presentation given by Chris Wolski at the third Port of the Future Conference in Houston in April 2022.

Cybersecurity incidents have affected the maritime cruise and shipping industry. In 2019, the Carnival Corporation, the world’s largest cruise line operator, announced that it had experienced a data breach affecting the payment card information of some of its guests and employees. More recently, in 2020, the shipping company CMA CGM suffered a cyber-attack that disrupted its operations for several days. These are just a few examples and there have been several other reported incidents of cyberattacks on ships and ports. The targeting of vessels with malware, phishing attacks, and the exploitation of vulnerabilities in shipboard systems is a common occurrence. It is important for the maritime industry to take steps to improve cybersecurity and protect against these threats.

We must ask ourselves if incidents like all of these could be a “sleight of hand twist of the wrist” for foreign military operations to embed or drop other payloads such as zero-days for later uses. In our area and community, we must not only start thinking like an adversary, but even more importantly, think like an engineer in the design, detection, and protection of both physical and cybersecurity. Think, prepare, and plan multiple threat vector events, and exercise them annually. Bringing in external consulting to facilitate the scenarios is very helpful to keep this from becoming a “check the box” exercise.

To protect against these threats, ports, and terminals must implement sound cybersecurity and physical security measures. Today, in-depth defense strategy begins with protecting our ports and terminals by ensuring that they have strong physical security measures in place. This includes measures such as fencing, gates, and guards to prevent unauthorized access to the facility. It is also important to have security cameras and other surveillance equipment in place to monitor activity within the port or terminal. An emerging threat to port and terminal security is the use of drones. Drones have the potential to be used for both malicious and

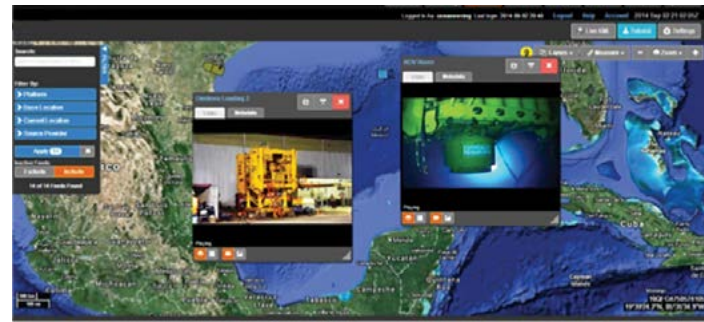


2022 Houston Maritime Security Collaboration Group Timeline of Threat Types

innocent purposes, but they can pose a threat to the security of a port or terminal if they are used to transport contraband or to conduct surveillance on the facility. To combat this threat, many ports and terminals have implemented drone detection and mitigation systems, which use radar and other technologies to detect and track drones in the area.

In addition to physical security measures, it is also important that ports and terminals have robust cybersecurity measures in place. This includes measures such as firewalls, antivirus software, backups, multifactor authentication and encryption to protect against cyberattacks. It is also important to regularly update these measures and to train employees on how to identify and prevent potential cyberthreats.

One area where ports and terminals are particularly vulnerable to cyberattacks is through their supply chain. Many ports and terminals rely on third-party logistics providers and other partners to manage the flow of goods in and out of the facility. These partners may not have the same level of cybersecurity protection as the port or terminal, leaving them open to potential attacks. To mitigate this risk, ports and terminals should ensure that their partners have strong cybersecurity measures in place and should regularly assess the security of their supply chain.



Another potential vulnerability for ports and terminals is the use of Internet of Things (“IoT”) and Industrial Internet of Things (“IIoT”) devices. These devices, which are connected to the internet and can be used to control and monitor various systems within the facility, can potentially be hacked and used to disrupt operations or steal sensitive data. To protect against this threat, ports and terminals should ensure that they have strong cybersecurity measures in place for their IoT devices and should regularly update and patch these devices to prevent potential vulnerabilities.

Tracking Local Threats

In addition to tracking of physical threats, the Houston Maritime Security Collaboration (“HMSC”) has been tracking threats from cyber adversaries that are actively probing their systems. These targeted vectors span the year, were primarily delivered via email, and cover the following types:

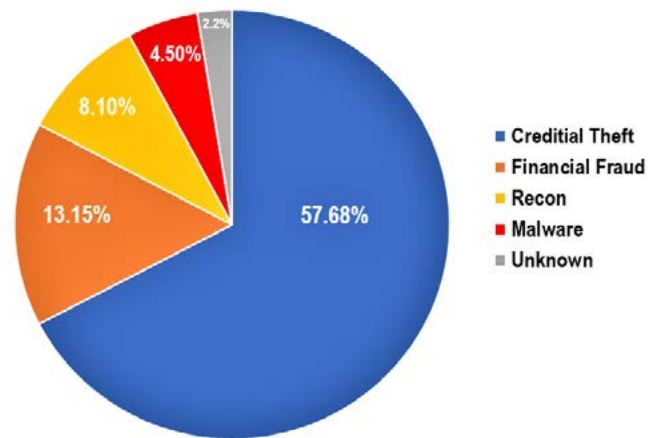
- **Credential Theft** - an attempt to acquire someone’s login credentials
- **Financial Fraud** - illegal manipulation or deception of financial transactions for personal gain.
- **Malware** - malicious software designed to harm or exploit computer systems.
- **Reconnaissance** - investigating and gathering information about a facility physically by social engineering (including cameras, drones, etc.) or through a computer network.

- **Unknown (MISC)** - a threat actor’s objective cannot be determined due to limits in analysis and response tracking.

The year led with 57 total credential theft attempts, followed by 13 financial fraud attempts, 4 malware payloads, 8 reconnaissance attempts, and 2 unknowns that our area port infrastructure and local industry reported to the Houston Maritime Security Collaboration group (“HMSC”). The HMSC is a group of people representing ports and terminals, including refining and chemical companies from Houston down to Corpus Christi that are vetted and that share alerts through secure means. This group can be joined by members of InfraGard and Houston Ship Channel Security District members that are in the need-to-know that play part in both the physical and cybersecurity affairs of their companies.

Overall Takeaways

HMSC Targeted Vectors by Cyberthreat Actors (2022)



In addition to cybersecurity measures, it is also important that ports and terminals have strong contingency plans in place to respond to potential cyberattacks. This includes having a team of physical and cybersecurity experts on hand to identify and respond to threats, as well as having backup systems in place to ensure that operations can continue in the event of an attack.

Overall, the protection of our maritime ports and terminals is crucial for the state’s economy and national security. By implementing strong physical security measures, such as drone detection systems, and robust cybersecurity measures, including strong supply chain security and contingency plans, ports and terminals can ensure that they are prepared to respond to any potential threats.

By working together, we can increase awareness and response times dramatically compared to years ago. This group has made great progress and can use more expertise. Also, for those needing a risk assessment for their site, please email marco.ayala@1898andCo.com for a site review.

If you are interested in joining the InfraGard CSC or the HMSC, please email marco.ayala@infragardhouston.org for details and information.

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Observations on the Proposed Draft Guidance for Nationally Consistent Coastal Zone Area Contingency Plan Architecture



Workers deployed boom around the site of the oil spill in the Houston Ship Channel near the Texas City Dike. More than 71,000 feet of boom was deployed in response to the oil spill. Photo courtesy of the USCG.

On November 10, 2022, the United States Coast Guard (“USCG”) published their “Proposed Draft Guidance for Nationally Consistent Coastal Zone Area Contingency Plan Architecture” for comment, 87 FR 67922, document 2022-24521.

The USCG is proposing to modernize the Coastal Area Contingency Plans (“ACP”) to improve usability and attain national consistency. This new, standardized construct will better enable industry plan writers of Vessel Response Plans (“VRP”) and Facility Response Plans (“FRP”) with multiple and diverse operating areas to consistently align with USCG-approved ACPs. A more standardized approach will minimize confusion due to highly variable ACP structures and content and will also facilitate more efficient responses, especially for large-scale responses requiring the mobilization of personnel and resources from outside a region. Additionally, adopting a nationally consistent architecture will facilitate the USCG’s development of more modern app-based ACP products for end users.

Adopting a national modernized format for the ACP will allow these plans to become more usable for first responders. Having the geographic response strategies in the same location in every ACP will make it easier for responders to locate the critical information needed for the protection of sensitive areas and the required priorities for those geographic areas. The new formatting also requires a more frequent review of

these strategies to ensure the information is accurate and up to date. Additionally, this will make the ACPs easier to use for responders and industry stakeholders that are required to develop response plans that are aligned and consistent with the ACPs. Having a nationally consistent format and an up-to-date ACP will allow for industry-level plans to be easier to develop and remain consistent with the National Response Framework and the ACPs. This is especially important for plan holders who have facilities and terminals located in multiple ACP-covered areas.

Under this standardized framework, sections 6000, 7000, 8000, and 9000 along with Annex E, and Annex K will be the most important sections on which responders, plan holders, and response organizations should focus. These sections will aid responders in developing response priorities, booming strategies, and protection strategies following a release or discharge. Familiarity with these sections of the ACP is necessary for all users of an ACP to ensure an effective response. Additionally, industry plan holders must also be familiar with these sections to ensure that their FRPs are aligned with the current information found within these sections.

For the Houston Ship Channel members in security, this new formatting will provide an easier-to-use ACP that will improve the necessary coordination needed in responding to an oil discharge or hazardous material release. One of the biggest changes will be the review and

update cycle for geographic response strategies that will require plan holders to check the ACP more often to ensure none of the response priorities have changed: plan holders, whether required by regulation or just by best practice, must stay familiar with changes and updates to the ACP. Once the proposed changes are approved and published, plan holders will need to review their existing plans against these and make updates accordingly.

The easiest way for plan holders and others in the area to stay apprised of the layout and information contained within the ACP is to attend the Area Committee meetings and participate in Area Level exercises. It will not change how plan updates or responses are done for oil or HAZMAT releases but will make it easier to locate the information needed.

For the ACPs to be overall community plans, as they were intended, will also require participation by the Area Committees in each region that help develop and implement the ACPs. Organizations, industry stakeholders, oil spill removal organizations, and local, state, and federal government representatives all must be participants in ensuring that the ACP for their areas are viable, up to date, and that responders and plan holders are familiar with the plan during an actual response.

Having alignment of the ACPs from federal, state, county/parish, and industry is a critical step in having a better-coordinated response. This proposed Coastal ACP architectural layout is a step in the right direction. ACPs now have a five-year national panel review and approval process that helps to ensure that these plans stay more up to date than they had in the past and will help them keep pace with emerging response technologies.

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Port Watch

Horror Vacui



The mariner of the 16th century gazing at a chart of the world's oceans would have cast his eyes on drawings of mythical sea creatures, various gods of the deep, and assorted depictions of the unknown. These embellishments were a convenient way for cartographers of that era to “fill in the blanks” for - just as nature abhors a vacuum – map makers abhorred empty spaces.

Over the next century or two, coastlines were rigorously charted; rivers and estuaries sounded; islands discovered; and even the mysterious southern ocean divulged its greatest secret – Antarctica. Eventually, the efforts of determined explorers, fearless seafarers, and intrepid souls from all walks of life cast Horror Vacui aside with their detailed discoveries.

Today, the vessels that call upon the ports of Texas are supersaturated with information every moment of their voyage. Hence, there is very little that is not known; even the shroud of fog is penetrated by radar and the AIS signals from ships navigating amidst its gossamer veil. More importantly, the cargoes transported aboard those ships are fastidiously tracked as part of the just-in-time commercial continuum. In essence, one knows what has been shipped and what has been ordered.

With the closing of the books on the 2022 arrival tallies last month, there is a clear picture on the state of maritime commerce in Texas. It is alive and well! 2022 outshined 2021 by 4% on the blue water front and 10% more tows transited across the Houston Ship Channel over the last year. Only two ports – Freeport and Brownsville - reported a vessel-arrival percentage decline in 2022.

Freeport experienced the most pronounced decline at 10%. After impressive gains in 2021, LPG and tanker arrivals dropped by 22% and 21% respectively. Given that LPG traffic comprises the largest category for the port, the cumulative impact would have been more significant but for the 8% increase in chemical tankers – the port’s 2nd busiest category. Meanwhile, Brownsville’s numbers tailed off by 7%, primarily due to double-digit percentage drops at both the general cargo and liquid carrier docks. Yet, the port’s most active category, heavy lift, ended the year 15% higher than the prior one.

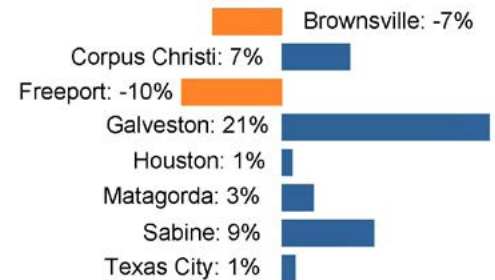
On the opposite end of the performance spectrum, the Port of Galveston grabbed top honors with a year-over-year 21% jump in arrival counts. An astounding accomplishment given that every vessel category – save one – lagged 2021’s count. Passenger vessels (cruise ships) logged a jaw-dropping 20-fold increase from 2021 to 2022. A COVID-weary population has

enthusiastically embraced returning to the high seas aboard floating resorts. What Texas City lacked in cruise ships, it more than made up for in chemical tankers – a category that accounted for 54% of the port’s total blue water vessel calls. Surprisingly, the 13% rise in this category only resulted in a 1% uptick which was offset by the 7% wane in oil tanker arrivals.

Sabine, on the other hand, witnessed year-to-date gains in nearly every major vessel category. The port’s two most-seen hull types, oil tankers and LPG vessels, were up 4% and 12% respectively. Bulkers and general cargo also saw impressive gains in 2022 - to the tune of 27% and 25% respectively. Overall, Sabine finished the year with the 2nd best performance of the Texas ports with a 9% climb and further solidified its position as the 2nd busiest Texas port vis-à-vis vessel traffic. Corpus Christi’s ship count did not eclipse that of Sabine, but things also perked up during the year by 7%. Its bulk and general cargo arrival stats were off by 19% and 60% respectively. Nonetheless, the port’s biggest customer – oil tankers – which comprise 50% of its total blue water throughput, outpaced 2021’s arrivals by 10%.

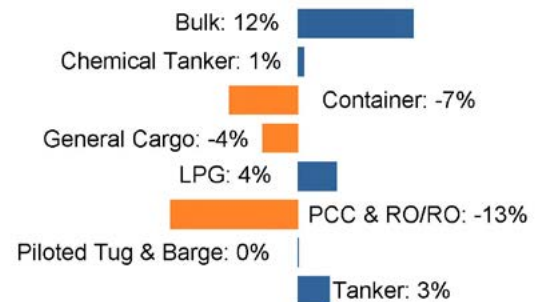
Houston, by far the state’s most active port, did not match the year-to-date percentage gains of either Sabine or Corpus Christi. Yet, the modest year-over-year 1% uptick is more significant than it appears on its face. Specifically, 7% fewer (i.e., larger) container ships transported 14% more TEUs – nearly 4 million to be more precise. Conversely, car carriers calls plummeted by 26% due to the supply-chain hangover that left many a car lot barren. The BTU triad of tankers, LPG and chemicals eked out gains of 3%, 4% and 1% respectively. General cargo activity slipped by 4%; however, the year’s

Deepdraft Vessel Arrivals by Port Q4 Year-to-Date Percent Change



Source: Greater Houston Port Bureau Marine Exchange

Houston Deepdraft Arrivals by Type Q4 Year-to-Date Percent Change



Source: Greater Houston Port Bureau Marine Exchange

darling was the bulkers which outpaced last year’s calls by 12%. This bounty of bulkers facilitated a 45% increase in general imports at Port Houston terminals. All in all, 2022 was a welcome return to normalcy after nearly 2 years of pandemic-induced turmoil.

Just as Columbus’ crews feared what lay beyond what was known, many an economist was faced with ignotum per ignotius when contemplating a post-pandemic world. As evidenced by what has unfolded across the Lone Star State’s waterfront in 2022, consumers and businesses are resilient and are recouping what was lost. Nevertheless, with talk of recession, European energy shortages and saber rattling in the South China Sea, 2023’s future certainly remains uncharted.



Tom Marian
Buffalo Marine Service
buffalomarine.com

Record Drought Gripped Much of U.S. in 2022

The large coverage and long duration of drought conditions across the U.S. set several records in 2022. The year was also marked by numerous severe weather events, devastating hurricanes and deadly flooding across parts of the country.





Nation struck with 18 billion-dollar disasters

Climate by the Numbers

2022

The average annual temperature across the contiguous U.S. was 53.4 degrees F — 1.4 degrees above the 20th-century average — ranking in the warmest third of the 128-year record.

Florida and Rhode Island both saw their fifth-warmest calendar year on record while Massachusetts ranked sixth warmest. Four additional states experienced a top-10 warmest year on record — California, Connecticut, Maine and New Hampshire. Alaska saw its 16th-warmest year in the 98-year record for the state.

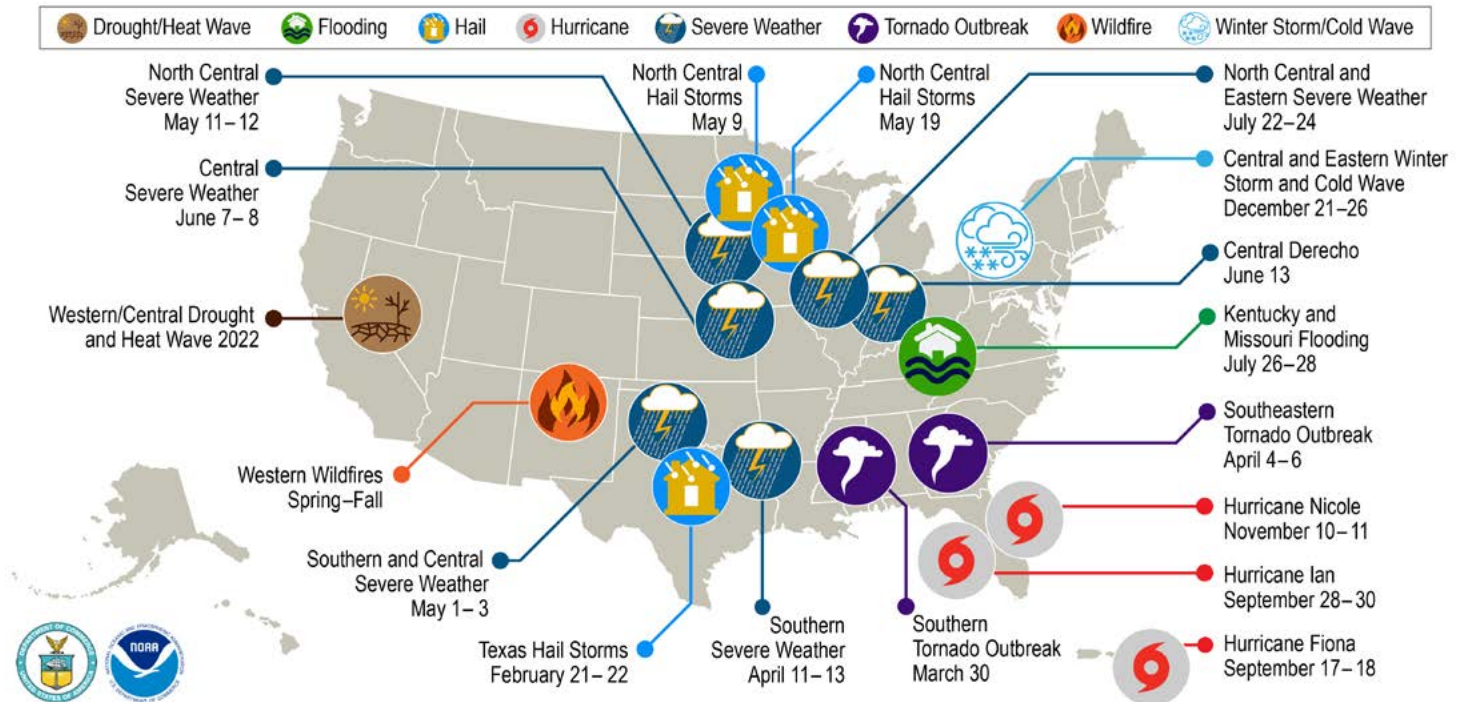
Annual precipitation across the contiguous U.S. totaled 28.35 inches (1.59 inches below average), which placed 2022 in the driest third of the climate record. Nebraska saw its fourth-driest year on record while

California had its ninth driest. Meanwhile, above-average precipitation caused Alaska to have its fourth-wettest year on record.

Drought coverage across the contiguous U.S. remained significant for the second year in a row, with a minimum extent of 44% occurring on September 6 and a maximum coverage of 63% on October 25 — the largest contiguous U.S. footprint since the drought of 2012.

In the western U.S., drought conditions reached a peak coverage of 91.3% of the region on May 3. Drought coverage across the West shrank as the summer monsoon reduced some of the coverage in the Southwest. The multi-year western U.S. drought resulted in water stress/shortages across many locations in 2022 as some major reservoirs dropped to their lowest levels on record.

U.S. 2022 Billion-Dollar Weather and Climate Disasters



This map denotes the approximate location for each of the 18 separate billion-dollar weather and climate disasters that impacted the United States in 2022.

Last year, the U.S. experienced 18 separate billion-dollar weather and climate disasters, leading to the deaths of at least 474 people. The following 18 events, each exceeding \$1 billion, put 2022 in third place (tied with 2011 and 2017) for the highest number of disasters recorded in a calendar year, behind 2021 — with 20 events — and 2020, with a record 22 separate billion-dollar events:

- One winter storm/cold wave event (across the central and eastern U.S.).
- One wildfire event (wildfires across the western U.S., including Alaska).
- One drought and heat wave event (across the western and central U.S.).
- One flooding event (in Missouri and Kentucky).
- Two tornado outbreaks (across the southern and southeastern U.S.).
- Three tropical cyclones (Fiona, Ian and Nicole).
- Nine severe weather/hail events (across many parts of the country, including a derecho in the central U.S.).

Damages from these disasters totaled approximately \$165.0 billion for all 18 events. This surpasses 2021 (\$155.3 billion, inflation adjusted) in total costs, which makes 2022 the third most costly year on record, only behind 2017 and 2005; all inflation adjusted to 2022 dollars).

Hurricane Ian was the most costly event of 2022 at \$112.9 billion, and ranks as the third most costly hurricane on record (since 1980) for the U.S., behind Hurricane Katrina (2005) and Hurricane Harvey (2017).

Over the last seven years (2016–2022), 122 separate billion-dollar disasters have killed at least 5,000 people, with a total cost of more than \$1 trillion in damages. Five of the last six years (2017–2022, with 2019 being the exception) have each had a price tag of at least \$100 billion.

Other Notable Climate and Weather Events in 2022

An average but destructive hurricane season: During 2022, 14 named storms formed in the North Atlantic Basin (four tropical storms, eight hurricanes and two major hurricanes), which is near the historical average. Several notable storms brought destruction and flooding to portions of the U.S.

Hurricane Fiona brought massive flooding to Puerto Rico, with some areas receiving 12–18 inches of rain. Hurricane Ian, with 150 mph sustained winds, made landfall in southwest Florida resulting in major flooding, damage and loss of life. Later in the year, Hurricane Nicole made landfall along Florida’s eastern shore, flooding the coast and knocking out power for hundreds of thousands of people. Nicole was the first hurricane to hit the U.S. during November in nearly 40 years.

An above-average tornado year: The preliminary U.S. tornado count for 2022 was approximately 9% above the 1991–2020 average across the contiguous U.S. with 1,331 tornadoes reported. March 2022 had triple the average number of tornadoes reported (293) and the most tornadoes reported for any March in the 1950–2022 record.

U.S. Selected Significant Climate Anomalies and Events for 2022



On Sep 17, remnants of Typhoon Merbok pounded Alaska's western coast, becoming the strongest storm to enter the Bering Sea during Sep in 70 years.



More than 3.1M acres burned in AK this year — the highest since 2015 and the seventh-highest total since 1950.

CONUS drought coverage remained significant for the second year in a row with a minimum extent of 44% occurring on Sep 6 and a maximum coverage of 63% on Oct 25 — the largest CONUS footprint since the drought of 2012. Drought impacted much of the western half of the U.S. and southern and central Plains for a majority of the year. Parts of the Northeast, Mid-Atlantic, Great Lakes, Southeast and Northwest were some of the only regions that remained drought-free across the CONUS throughout 2022.



In Nov and Dec, lake-effect snowstorms slammed parts of NY with record amounts of snowfall causing road closures, travel bans, power outages and loss of life.

On Dec 21-25, a powerful arctic front wreaked havoc across much of the nation, bringing heavy rains, snow, ice and high winds that sent temperatures plummeting at record speed. More than 200M people were under a winter weather advisory or warning and more than a million customers, from TX to ME, were left without power.

During Sep 28-30, Hurricane Ian made landfall in FL as a strong Cat 4 hurricane, resulting in major flooding, damage and loss of life. Ian created additional damage as it made a second landfall in SC as a Cat 1 hurricane.

Hurricane Fiona brought massive flooding to Puerto Rico in Sep. One station reported 27.14 in. of rain in 24 hrs while other locations reported 12-18 in.

A heatwave settled over the West the first week of Sep and brought scorching temperatures that set all-time record highs. On Sep 9, nearly 1,000 heat records were broken.



During Jul-Sep, four separate significant rainfall events caused major flooding in St. Louis, MO, southern IL, eastern KY and the Dallas metro area, leading to flooded roads, delayed flights and many residents trapped in their homes.



On Jul 16-17, the remnants of TS Darby brought historic surf conditions to HI, causing major flooding and road closures. In Keauhou-Kona, a giant wave crashed over two-story condos.



The Hermits Peak Fire became the largest wildfire on record in NM at more than 341K acres consumed between Apr and Jun. Over 66K fires burned around 7.5M acres across the U.S. this year, which is near average.



2022 ranked 18th warmest year on record; the average U.S. temperature was 53.4°F, 1.4°F above average. The 2022 U.S. precipitation average was 28.35 in., 1.59 in. below average, ranking 27th ... etc. record



Please Note: Material provided in this map was compiled from NOAA's State of the Climate Reports. For more information please visit: <https://www.ncei.noaa.gov/access/monitoring/monthly-report/>

Wildfires scorched the West, Alaska: In addition to the active wildfire year across the western U.S., Alaska saw one million acres burned by June 18 — the earliest such occurrence in a calendar year than any other time in the last 32 years. By July 1, 1.85 million acres had been consumed — the second-highest June total on record and the seventh-highest acreage burned for any calendar month on record for Alaska.

More: Find NOAA's climate reports and download the images from the NCEI climate monitoring website at: www.noaa.gov/news/record-drought-gripped-much-of-us-in-2022

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Enterprise's SPOT Offshore Project Receives Milestone Decision

To be located just off the coast of Brazoria County, Texas, Enterprise Product's SPOT is one of the world's most environmentally focused energy infrastructure projects.



Enterprise Products Partners L.P. (“Enterprise”) is one of the leading North American providers of midstream energy services to producers and consumers of natural gas, NGLs, crude oil, refined products and petrochemicals. On November 21, 2022, the company received its Record of Decision (“ROD”) from the U.S. Department of Transportation’s Maritime Administration in accordance with the provisions of the Deepwater Port Act of 1974 for their Sea Port Oil Terminal (“SPOT”) project. The receipt of the ROD is a significant milestone in the process to obtain a license for SPOT under the Deepwater Port Act. SPOT must comply with state and federal permitting, mitigation, and related requirements outlined in this Record of Decision before a license can be issued and SPOT can begin construction of the proposed deepwater port.

The proposed SPOT project is comprised of a fixed platform, deepwater port marine terminal in the Gulf of Mexico that will be manned and

connected to an onshore crude oil storage facility (“Oyster Creek Terminal”) with approximately 4.8 million barrels of capacity in Brazoria County, Texas. The Oyster Creek Terminal will be constructed about 2.5 miles northeast of Lake Jackson, Texas, and four miles southeast of Angleton, Texas. The platform will be located approximately 30 nautical miles off the coast of Texas in approximately 115-feet of water. The platform will be connected to the onshore storage facility (“ECHO Terminal”) by two 36-inch, bi-directional pipelines and located in federal waters. The dual pipelines will allow crude oil to be emptied within 24 hours in case of hurricane. SPOT will consist of a fixed offshore platform with a laydown deck, main deck, living quarters and other ancillary equipment. SPOT is designed to load Very Large Crude Carriers (“VLCC”) and other crude oil tankers at rates up to 85,000 barrels per hour.

SPOT is one of the world's most environmentally focused energy infrastructure projects that includes state-of-the-art pipeline control, vapor recovery and leak detection systems. SPOT is designed to reduce carbon dioxide and volatile organic compound ("VOC") emissions by approximately 65 percent and 94 percent, respectively, compared to current industry practices. It also significantly reduces spill and collision risk and enhances overall maritime safety by eliminating the current routine of ship-to-ship oil transfers at sea.

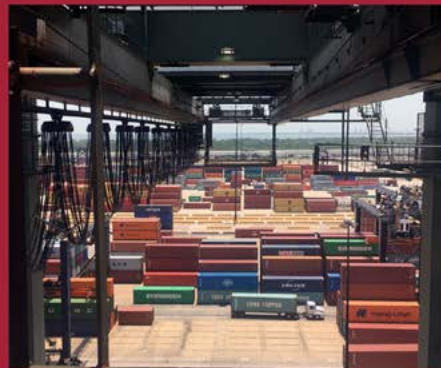
This project would support as many 1,400 temporary jobs during construction while the project operations would generate 62 permanent jobs in onshore/offshore facilities over the 30 years life of the project.

Enterprise has begun work to satisfy the remaining conditions to obtain the deepwater port license in 2023. Remaining conditions include routine construction, operating and decommissioning guarantees, submission of public outreach, wetland restoration and VOC monitoring plans, and other state approvals. The Maritime Administration has indicated it will work with SPOT to address and satisfy the conditions of approval for the issuance of the license.

The Maritime Administration and U.S. Coast Guard led the comprehensive, almost four-year environmental review of this project. The ROD includes reviews by more than a dozen federal governmental agencies, including the Army Corps of Engineers and Environmental Protection Agency, as well as reviews and approvals by the state of Texas. Following are some of the notable findings from the ROD:

- The construction and operation of the port is in the national interest because the project will benefit employment, economic growth, and U.S. energy infrastructure resilience and security. The port will provide a reliable source of crude oil to U.S. allies in the event of market disruption and have a minimal impact on the availability and cost of crude oil in the U.S. domestic market. Construction and operation of an offshore export terminal and the installation of a vapor combustion system at the DWP will reduce the number of ship-to-ship transfers of crude oil and lessen emissions from conventional crude oil loading, thus providing a more efficient, less impactful crude oil transport facility within the offshore waters of the United States.
- The project will be constructed and operated using the best available technology. Operating safety and control features of the project will include autonomous shutdown valves, HIPPs, fire and gas detection, emergency shutdown and safety controls, and process control systems.

While a portion of the crude oil produced by the U.S. is refined for domestic use, the U.S. Energy Information Administration projects that the U.S. will be a net petroleum exporter from 2024 to 2050. High export levels are driven by less consumption of liquidfuels in the U.S. as well as the production of crude oil grades that cannot be processed economically by U.S. refineries. Along with the lifting of the crude oil export ban in 2015, these developments have increased interest in the development of offshore deepwater ports for exporting U.S.-produced crude oil.



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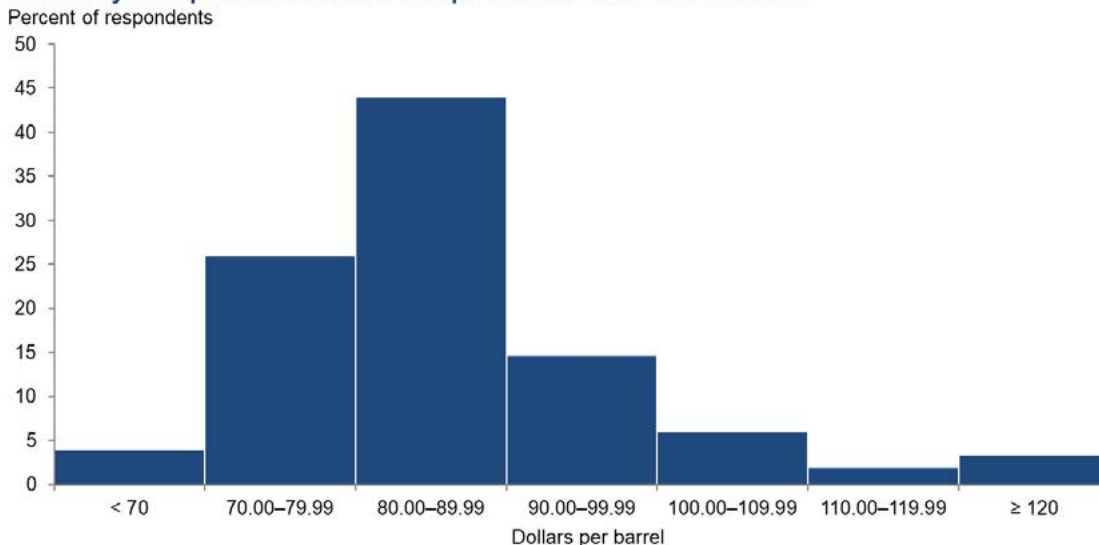
Oil and Gas Expansion Still Solid; Cost Increases Moderate, Supply-Chain Delays Persist

Federal Reserve Bank of Dallas



This Dallas Federal Energy report focuses on capital spending in 2023; the oil price firms use for budgeting; expectations for how much input prices will change in 2023; the primary factor weighing on crude oil and natural gas production growth; plans for reducing greenhouse emissions; and expectations for oil and gas support services firms' revenue mix from alternative energy by year-end 2025.

What do you expect the WTI crude oil price to be at the end of 2023?



NOTES: Executives from 150 oil and gas firms answered this question during the survey collection period, Dec. 7–15, 2022. The average response was \$84 per barrel. For reference, WTI (West Texas Intermediate) spot prices averaged \$73.67 per barrel during the period.

SOURCES: Federal Reserve Bank of Dallas; Energy Information Administration (reference price).

Activity in the oil and gas sector continued growing in fourth quarter 2022, according to oil and gas executives responding to the Dallas Fed Energy Survey. The business activity index—the survey’s broadest measure of conditions facing Eleventh District energy firms—remained positive but fell to 30.3 in the fourth quarter from 46.0 in the third. This suggests the pace of expansion decelerated but remained solid as the business activity index stayed above the series average.

Oil and natural gas production increased at a slightly slower pace compared with the prior quarter, according to executives at exploration and production (E&P) firms. The oil production index declined to 25.8 in the fourth quarter from 31.7 in the third. Likewise, the natural gas production index moved down, to 29.4 from 35.6.

Firms reported rising costs for an eighth consecutive quarter, with the indexes remaining elevated. However, the rate of those increases has slowed. Among oilfield services firms, the input cost index was 61.8 versus 83.9 last quarter. Among E&P firms, the finding and development costs index was 52.5, a modest decline from 64.7 last quarter. Additionally, the lease operating expenses index dropped 22 points to 48.4.

It is taking longer for firms to receive materials and equipment, although the pace at which those delays is growing has moderated. The supplier

delivery time index remained positive but declined to 14.4 in the fourth quarter from 28.4 in the third. Among oilfield services firms, the measure of lag time in delivery of services edged down to 20.0 from 21.1, remaining well above average.

Oilfield services firms reported broad-based improvement, with key indexes remaining solidly positive. The equipment utilization index fell to 32.8 in the fourth quarter from 55.2 in the prior quarter. The operating margin index edged up to 25.9 from 25.4. The index of prices received for services remained positive but declined to 43.6 from 64.9.

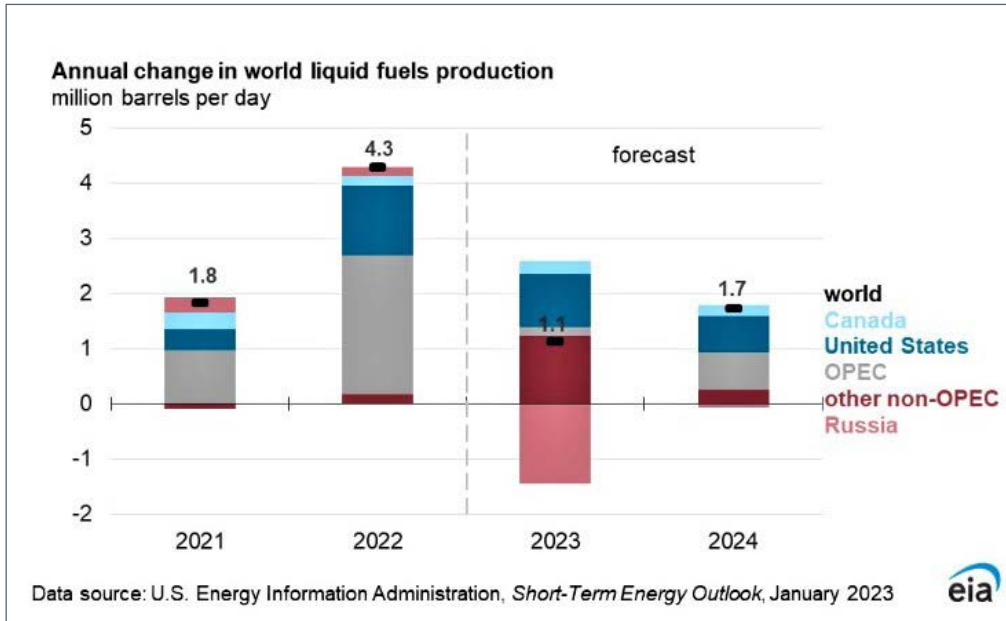
All labor market indexes in the fourth quarter remained elevated, pointing to strong growth in employment, hours and wages. The aggregate employment index posted an eighth consecutive positive reading but moved down to 25.7 from last quarter’s series high of 30.0. The aggregate employee hours index moved down to 27.7 from 33.3 in the prior quarter. The aggregate wages and benefits index remained positive but declined to 40.2 from 47.3.

Optimism waned in the fourth quarter as the company outlook index posted a 10th consecutive positive reading but fell 20 points, below the series average, to 13.1. The overall outlook uncertainty index increased to 40.1 from 35.7, suggesting growing uncertainty, especially among E&P firms. The uncertainty index was 30.9 for services firms versus 45.4 for E&P firms, with 53 percent of E&P firms reporting an increase in uncertainty.

On average, respondents expect a West Texas Intermediate (WTI) oil price of \$84 per barrel by year-end 2023; responses ranged from \$65 to \$160 per barrel. Survey participants expect Henry Hub natural gas prices of \$5.64 per million British thermal units (MMBtu) at year-end. For reference, WTI spot prices averaged \$73.67 per barrel during the survey collection period, and Henry Hub spot prices averaged \$5.93 per MMBtu.

January Short-Term Energy Outlook

U.S. Energy Information Administration



Global Oil Markets

The EIA forecasts world production of petroleum and other liquid fuels will increase by 1.1 million barrels per day (“b/d”) in 2023 and 1.7 million b/d in 2024. This increase reflects large growth in several non-OPEC countries and in OPEC output that more than offset 1.5 million b/d of declines in Russia’s production over the forecast period.

The forecast for the United States and other non-OPEC producers outside of Russia will add 2.4 million b/d of oil production in 2023 and an additional 1.1 million b/d in 2024. The largest source of non-OPEC production growth over the forecast period is the United States, which contributes 40% of growth in 2023 and 60% of growth in 2024. U.S. growth is driven by increases in crude oil production in the Lower 48 states—mostly in the Permian region—as well as a combination of increases to production of hydrocarbon gas liquids and biofuels, which together account for about 40% of U.S. liquid fuels production growth in 2023 and 2024.

Outside of the United States, other major sources of growth in non-OPEC liquid fuels production come from Canada, Brazil, Guyana, and Norway. EIA expects that increases in Canada’s production will be driven by projects to improve distribution bottlenecks, including the start-up of the Trans Mountain pipeline expansion project. Brazil’s increases are driven by new floating production, storage, and offloading (“FPSO”) deepwater rigs.

A new source of world oil supply is Guyana, which first began producing oil in 2019 after the discovery of the new offshore deepwater Liza oil field. Critical investment and new production vessels helped Guyana’s oil production increase to an average of 260,000 b/d in 2022. EIA expects further ramp-ups in output and the development of new oil resources

over the next two years, helping oil production in Guyana increase to an average of 540,000 b/d by 4Q24.

Growth in Norway’s oil output in 2023 stems from the recent start-up of the offshore Johan Sverdrup Phase 2 expansion project, which will result in Norway’s liquid fuels production rising by more than 500,000 b/d over the forecast to reach almost 2.5 million b/d in 2024.

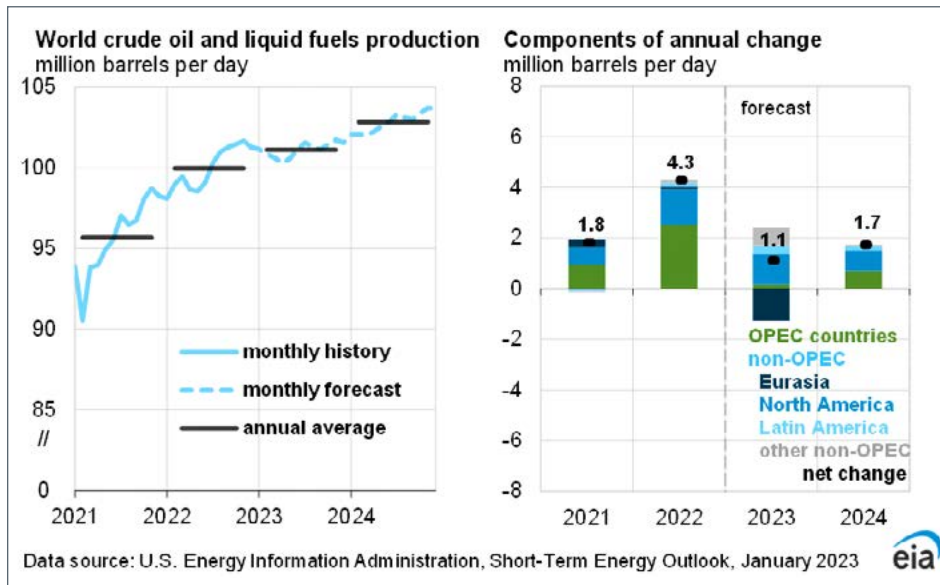
EIA expects that these sources of growth in non-OPEC liquid fuels supply will offset declines in Russia’s oil production. They forecast that Russia’s petroleum and other liquid fuels production will decline to 9.5 million b/d in 2023, from 10.9 million b/d in 2022, and then average 9.4 million b/d in 2024. The extent to which European Union sanctions, other sanctions, and the G7 price cap will affect Russia’s crude oil and petroleum product exports and production remains uncertain.

The expectations that most crude oil exports from Russia will continue to find buyers. The sanctions on petroleum products will cause greater disruptions to Russia’s oil production and exports because finding alternative buyers as well as transportation and other services to reach those buyers is likely to be more challenging than for crude oil.

OPEC crude oil production in EIA forecasts averages 29.5 million b/d in 2024, up 0.8 million b/d from 2022. Part of this growth is driven by Venezuela. Following the U.S. Department of the Treasury issuing General License (“GL”) 41 at the end of November, Chevron is resuming oil production in Venezuela for export to the United States. OPEC production forecast is subject to considerable uncertainty, driven by a combination of possible outcomes for country compliance to existing OPEC+ production targets and changes to existing OPEC+ targets, as well as ongoing developments in Iran, Libya, and Venezuela.

Global liquid fuels consumption: Forecast global consumption of liquid fuels reaches 102.2 million b/d in 2024, driven primarily by growth in non-OECD countries, such as India and China. Trends in oil consumption largely reflect trends in economic activity. EIA forecasts growth in global demand for oil will slow in 2023 before picking up in 2024, as global GDP growth (based on forecasts from Oxford Economics) rises from 1.8% in 2023 to 3.3% in 2024. Although they forecast global oil consumption to increase, the demand forecast remains uncertain as a result of ongoing concerns around global economic conditions and the impact of the easing COVID-19 restrictions and rising case counts in China.

Petroleum Products



Gasoline and diesel prices: Gasoline and diesel prices in the EIA forecasts generally decline as wholesale refining margins and crude oil prices fall. In December 2022, the U.S. retail price for regular grade gasoline averaged \$3.21 per gallon (“gal”), and the retail diesel price averaged \$4.71/gal. December prices were the lowest since the beginning of Russia’s full-scale invasion of Ukraine in February. In EIA’s forecast for 2023 and 2024, U.S. refinery runs, and gasoline and diesel production are higher than in 2022, which along with increasing global refinery capacity, will contribute to narrowing U.S. refining margins in 2023 and 2024.

EIA forecasts retail gasoline prices will remain close to current levels and average about \$3.30/gal in 2023. In 2024, retail gasoline forecast prices will average about \$3.10/gal and fall below \$3.00/gal by January 2023 the end of the year. The retail diesel forecast prices average about \$4.20/gal in 2023 and near \$3.70/gal in 2024. Diesel prices will remain higher than gasoline prices as the market continues to adjust to disruptions largely related to responses to Russia’s full-scale invasion of Ukraine. Russia had been a major supplier of diesel fuel to Europe, which is now importing more diesel from the Middle East and India.

Gasoline and distillate inventories: In 2022, both gasoline and distillate inventories in the United States were below their previous five-year (2017–2021) averages for the entire year because of reduced refinery capacity, less-than-average imports, and expanding exports. Higher refinery runs and less consumption contributed to distillate fuel inventories increasing during 4Q22 by more than the previous five-year average. EIA estimates that 5.1 million barrels per day of distillate was produced in the United States during 4Q22, up 5% from a year earlier, as refiners increased production in response to high crack spreads—the

difference between the price at which refiners sell fuel and the price of crude oil.

EIA expects U.S. distillate inventories will increase in 2023 due to increasing refinery runs as refiners capitalize on high distillate crack spreads. Refiners have a limited ability to shift their product yields, so the expectation of gasoline production is to increase in 2023 alongside distillate production. As a result, the forecast gasoline inventories will rise above their previous five-year average from May 2023 through the end of the year. Although net U.S. exports of gasoline will increase in 2023, expectation of these volumes will come from increased gasoline production. EIA forecasts almost no change in U.S. gasoline consumption

over the next two years. Their expectation of relatively flat gasoline consumption stems from increases in vehicle miles traveled being offset by increases in the fuel efficiency of the vehicle fleet.

Declining freight activity and declining manufacturing activity in distillate-intensive industries led to decreased U.S. distillate consumption at the end of 2022. The EIA’s 4Q22 estimate for U.S. distillate consumption of 3.9 million b/d was the lowest for a fourth quarter since 2015. In the forecast, U.S. distillate consumption declines slightly in 2023. However, distillate consumption will pick up in 2024 as the rate of economic growth increases.

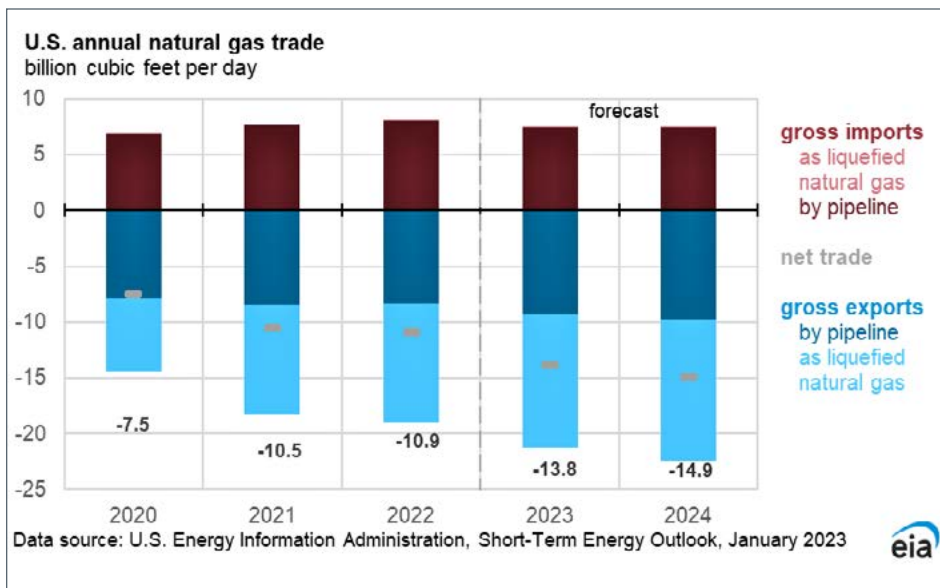
Natural Gas

Natural gas prices: EIA expects the Henry Hub natural gas spot price to average near \$5.00 per million British thermal units (“MMBtu”) in 1Q23. The Henry Hub price began January below \$4.00/MMBtu as a result of warmer-than-normal temperatures across much of the country. However, prices are expected to rise back above \$5.00/MMBtu in late-January and stay above that in February as temperatures in the forecast fall and liquefied natural gas (“LNG”) exports from Freeport LNG resume, increasing demand for natural gas.

Extreme weather events can cause price spikes and volatility at both the Henry Hub and in regional markets. Spot prices reached more than \$50.00/MMBtu in some western markets in December, and potential natural gas supply constraints in New England could cause large price increases if extreme cold weather hits the region. Based on the most recent press release from Freeport LNG, the facility will resume partial operations in January, which will increase U.S. LNG exports and put upward pressure on prices. However, any additional delays to the restart of Freeport, which was originally scheduled to restart partial operations in November, will contribute to downward pressure on prices in the near term.

Once heating demand subsides this winter, the prices are expected to average near \$5.00/MMBtu for the last three quarters of 2023. Increases in U.S. natural gas production, relatively flat LNG exports, and declining domestic consumption in the electric power and industrial sectors will limit upward pressure on prices in 2023.

Despite expectation that new LNG export facilities and expansion projects will come online in 2024, EIA expects natural gas prices to be relatively flat—with the possibility of lower prices—due to continued



reflects trends in the housing stock. The forecast assumes the U.S. housing starts resume growing in 2024 after a sharp decline in growth in 2023.

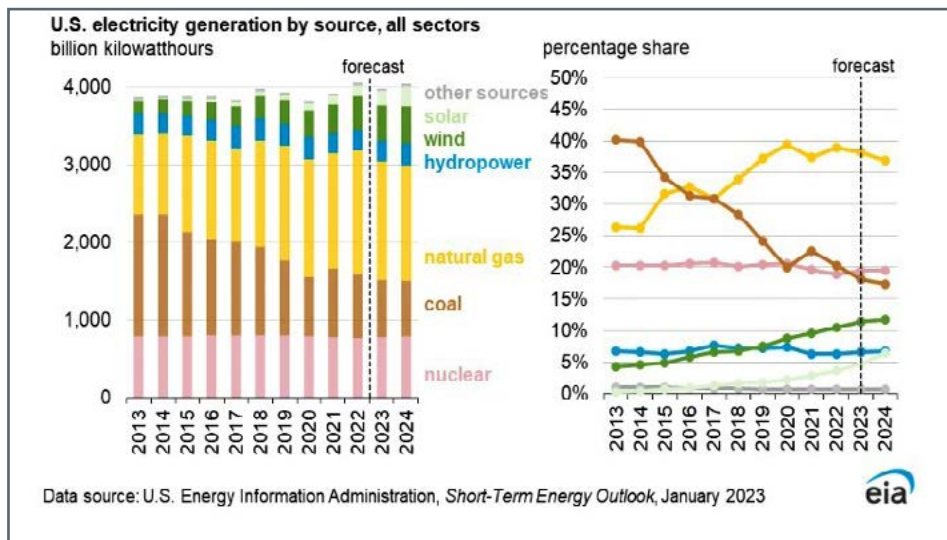
Electricity generation: U.S. generation in the EIA forecast largely follows consumption, declining in 2023 then rising in 2024. Generation from renewable sources is the main contributor of growth in U.S. electricity generation. The forecast share of U.S. renewables generation rises from 21% in 2022 to 24% in 2023 and to 26% in 2024. About two-thirds of this forecast increase in renewables generation comes from new utility-scale solar photovoltaic capacity, and most of the rest is from new wind projects. The share of electricity generation supplied by natural gas is expected to decrease from 39% in 2022 to 38% in 2023 and 37% in 2024 while the share of electricity generated by coal will fall from 20% in 2022 to 18% in 2023 and 17% in 2024. The share of nuclear power generation remains close to 19% over the next two years.

increases in U.S. natural gas production. EIA expects production in both the Permian region in West Texas and Southeast New Mexico and in the Haynesville region in Louisiana and East Texas to continue to grow with the completion of new pipeline infrastructure expansions in 2023 and 2024.

Natural gas consumption: During the winter months in the United States, the residential and commercial sectors are large drivers of natural gas consumption because natural gas is used for space heating in homes and commercial buildings and demand for heating rises as the weather gets colder. EIA expects natural gas consumption in the U.S. residential and commercial sectors to average about 46 billion cubic feet per day (“Bcf/d”) in January, which is slightly less than the five-year (2018–2022) average. Less-than-average January consumption reflects a relatively mild start to the month across much of the country that reduced space heating demand for natural gas. EIA expects U.S. residential and commercial natural gas consumption to average 43 Bcf/d in February, which is also less than the five-year average, as forecasts from the National Oceanic and Atmospheric Administration indicate above normal temperatures for February in the eastern part of the United States. Residential and commercial natural gas consumption can be highly variable in winter months due to extreme weather events, such as in February 2021 when extreme cold weather across much of the United States led to increased residential and commercial natural gas consumption.

to 19% over the next two years.

Power generators plan to add 32 gigawatts (“GW”) of utility-scale solar photovoltaic (“PV”) in 2023 and another estimated 32 GW in 2024. The small-scale solar capacity will grow by 9 GW in 2023 and by 12 GW in 2024. Wind capacity increases by 6 GW in both 2023 and 2024. Battery storage additions to capacity are 10 GW in 2023 and 9 GW in 2024.



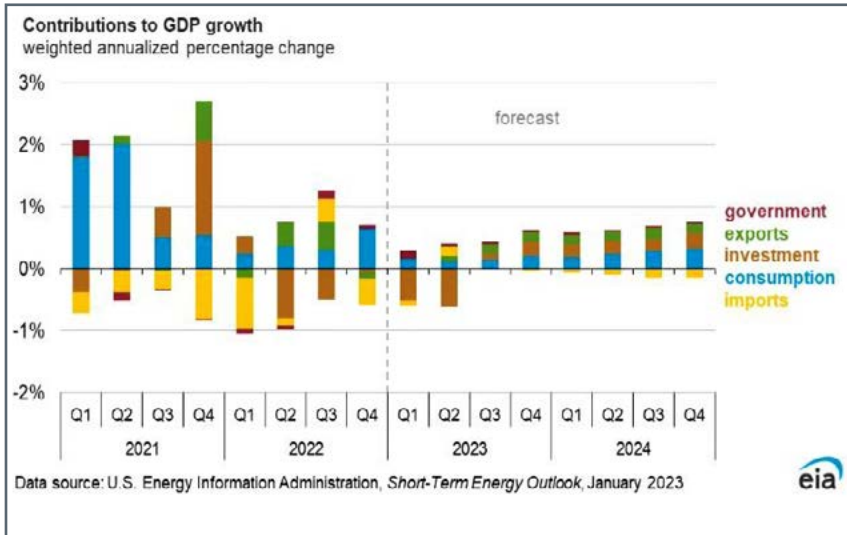
Electricity and Renewables

Electricity consumption: EIA forecasts that total consumption of electricity in the United States will remain fairly stable, falling by 1% in 2023 and then growing by just over 1% in 2024. They estimate that electricity consumption grew by 3% in 2022.

Most expected change in U.S. electricity demand occurs in the residential sector, where expected retail sales will fall as a result of a milder summer in 2023 compared with 2022 with about 10% fewer cooling degree days. Residential electricity sales grow in 2024 because 5% more heating degree days are expected in 1Q24 compared with 1Q23. The forecast also

Economy, Weather, and CO2

U.S. macroeconomics: EIA incorporates STEO energy price forecasts into their S&P Global macroeconomic model to obtain the final U.S. macroeconomic outlook for their forecast, S&P Global is forecasting a mild recession, starting in 1Q23. As a result, EIA forecasts GDP to grow by 0.5% in 2023, with the economy recovering from the recession and returning to positive GDP growth in 3Q23. In 1Q23, real GDP contracts at an annual rate of 0.7%, mostly due to a decline in residential fixed investment and private business inventories of goods. The recovery expectation is to be led by net exports and personal consumption expenditures in 2Q23, with the entire economy returning to growth later in the year.



mostly from decreasing coal-fired electricity generation. More renewable generation contributes to decreases in natural gas-fired electricity generation, which in turn decreases CO2 emissions from natural gas by 2%. The petroleum emissions are expected to remain about the same.

U.S. energy-related CO2 emissions in 2024 remain unchanged from 2023 in the EIA forecast because increasing emissions from petroleum products offsets decreasing emissions from natural gas. Petroleum CO2 emissions increase slightly as a result of increases in air and road travel, as well as increasing hydrocarbon gas liquid consumption, particularly propane. More consumption of propane arises from increased industrial activity, as propane is used as a petrochemical feedstock.

Personal consumption expenditures are expected to grow through 2024, despite an increase in consumer savings from historically low levels. Throughout 2023, EIA expects the labor market to weaken, with the unemployment rate reaching a peak of 5.2% in 4Q23.

Emissions: The EIA predicts the total energy-related carbon dioxide (“CO2”) emissions to decrease in the United States by more than 3% in 2023. Relatively flat economic growth and an increase in electricity generation from renewable sources decreases fossil fuel consumption, and therefore emissions. Among the major fossil fuel categories, CO2 emissions from coal decline the most in the United States at around 11%,

Weather: In December, the United States experienced 27% more population-weighted heating degree days (“HDDs”) than last year and 9% more than the 10-year average. Based on forecasts from the National Oceanic and Atmospheric Administration, EIA expects 1Q23 to be milder than last winter, with 5% fewer HDDs in the United States compared with 1Q22 and 4% fewer than the 10-year average. EIA has updated their expectations for winter heating fuel expenditures based on the most recent temperature and price forecasts.



BARGING AHEAD

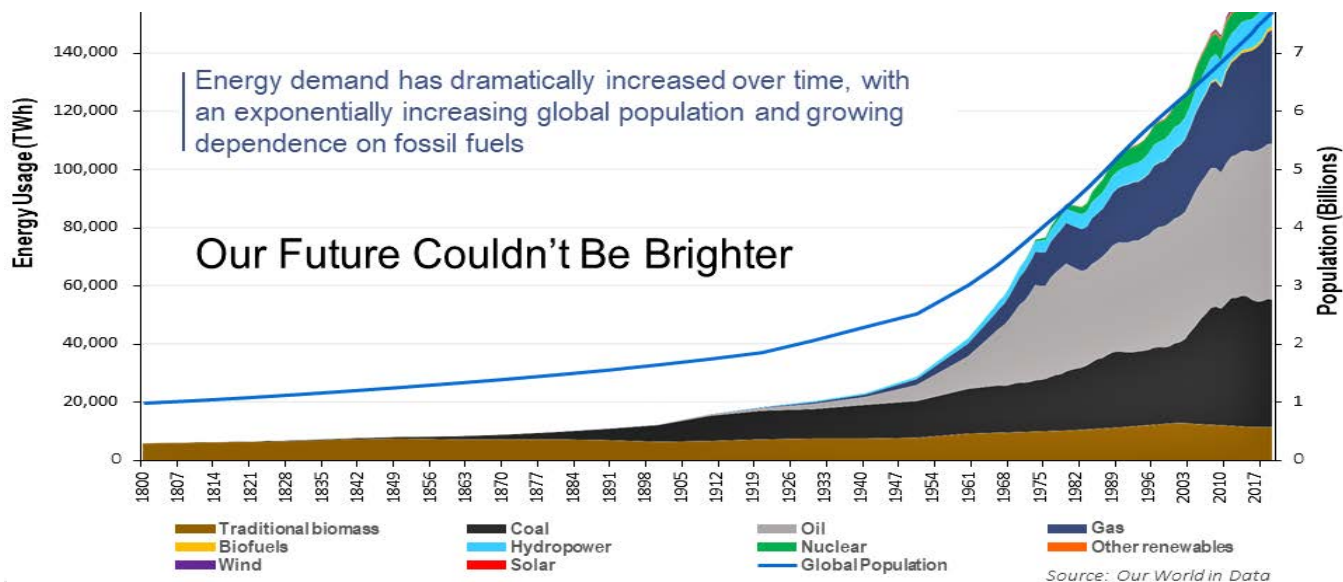
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January 2023 Commerce Club & Annual Meeting

Featuring Tony Chovanec, Sr. Vice President - Fundamentals, Enterprise Products Partners



Tony Chovanec presented his perspective for the outlook of business in Houston’s port region in “Our Future Couldn’t Be Brighter” to attendees at the Port Bureau’s January 12 Commerce Club luncheon. Chovanec is senior vice president of Fundamentals at Enterprise Products Partners.

Opening his data-rich presentation with insights on the global energy landscape, Chovanec noted the following factors:

- Non-OECD [Organization for Economic Cooperation and Development] nations have taken center-stage on energy demand growth from all sources; meanwhile, rapid and poorly planned moves away from traditional energy sources have proved to be highly inflationary
- Unfortunately, the world has had a rude awakening with Russia’s invasion of Ukraine; Energy Security takes center stage
- The Shale Revolution rapidly changed the U.S. from being a dependent importer for virtually all energy to becoming an energy independent, exporting nation
- The Houston area rapidly redefined the meaning of “energy capital of the world” as it became America’s epicenter for liquid hydrocarbon exports
- U.S. hydrocarbon demand is generally not expected to grow; Exports will continue to steadily expand
- The Permian basin: Delaware and Midland have quickly moved into “World Class” status, with majors moving focus from global activities to the Permian basin
- Project 11 becomes a reality in debottlenecking the Houston Ship Channel for the long term

In discussing the U.S. oil production outlook, Chovanec particularly commented on the changes shale has brought to the industry. He described the manufacturing process as “unbelievably sophisticated”, observing that the Permian Basin offered millions of acres with “stacked pay zones” or areas that can accommodate wells from a one relatively small surface area. “No other country can do what we’ve done,” said Chovanec.

Chovanec also discussed commodity fundamentals as a part of the presentation. Looking at oil price forecasts, he considered these factors:

- U.S. Producer and OPEC+ will maintain supply side discipline
- Russia: Supply fears of 2+ MMBPD offline in 2023
- Central banks worldwide fighting inflation
- Demand growth being revised lower by most agencies, but as expected still growing
- China COVID policy reversed; pace of recovery surprising to the upside

“The Houston Ship Channel will get busier,” Chovanec said as he moved on to exports. Indicating the U.S. was the world’s largest exporter of LNG, he stressed the need for LNG terminals and for fast-tracking of projects by the Federal Energy Regulatory Commission (“FERC”). He noted that more than 90% of “operational” capacity is on the Gulf Coast and that facilities under construction are located on the Gulf.

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Houston Pilots Elect Captain Clint Winegar as Presiding Officer



The Houston Pilots announced their election of officers for the 2023 Executive Committee at the end of last year, with Captain Clint Winegar serving in the position of presiding officer. Captain Winegar is a graduate of Texas A&M at Galveston with a Bachelor of

Science in Marine Transportation. Previously he held the position of second officer of the Houston Pilots (2014-2015 and 2022). In addition, he serves as vice president of the American Pilots Association representing the Gulf states of Texas, Alabama, and Mississippi.



Captain Winegar succeeds Captain Robert Thompson in the position. Captain Thompson has served three terms as presiding officer. Highlights of his pilot career include acting as presiding officer during preparations for and response to Hurricane Ike, working with key senior industry and government representatives to establish the Lone Star Harbor Safety Committee, and piloting the tow transporting one of the space shuttles up the Houston Ship Channel to its final destination at the Johnson Space Center.

Channel to its final destination at the Johnson Space Center.



Completing the 2023 Houston Pilots Executive Committee are Captain Matthew H. Glass serving as second officer and Captain Stephen Jewell serving as boatkeeper. While being a skilled ship pilot is the primary role of a Houston Pilot, pilots serve in leadership roles as part of the Executive Committee as well as participating in committees to help manage their business and ensure they have the highest safety standards.

The Houston Pilots provide pilotage services to vessels entering or departing the port of Houston, 24-hours per day, 365 days per year.

FUTURE EVENTS: txgulf.org/events

- **February 9:** Commerce Club luncheon featuring Scott Elmer, Interim Deputy Director of Engineering and Construction, Harris County Flood Control District. Sponsorships available!
- **February 17:** Port 101 featuring CAPT Bill Diehl.
- **March 9:** Commerce Club luncheon featuring COL Michael E. Fossum, VP Texas A&M University, CEO of the Galveston Campus and Superintendent of the Texas A&M Maritime Academy.
- **May 18:** Commerce Club luncheon featuring CAPT Bill Diehl, president, Greater Houston Port Bureau, Retirement Celebration Sponsorships available!
- **April 3:** Women in Maritime Happy Hour: Details to come!
- **August 26:** Port Bureau's 2023 Annual Maritime Dinner

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