

Contents

Back in order! The Russians will continue to produce Project 22160 ships, but will change their armaments

Russians feverishly search for weapons for war with Ukraine

Lockheed Martin delivers HELIOS laser weapon system to US Navy

Q&A on the future of the US Navy's amphibious fleet

China redeploys top ships to Taiwan Strait

Conversion begins for hydrogen-powered barge

Shell Prelude FLNG plant remains offline as union extends strike

Maersk signs \$500 million deal with Suez Canal Authority to build berth at eastern port

Turks come to Russia's rescue in big Arctic LNG project

Grand jury indicts seven in fraudulent extortion scheme at Port of San Juan

Search for a fully self-sustaining vertical shrimp farm

Aqua-Spark and chemical giant partner to invest in seaweed firm

Is krill fishing accelerating climate change?

Back in order! Russians will continue to produce Project 22160 ships, but will change their armaments

The general director of the Russian Federation's Ak Bars shipbuilding corporation, Renat Mistakhov, said on 17.08.2022 that the production of Project 22160 patrol vessels will continue, but with the replacement of the armaments on board. According to him, the ships of this type will be equipped with Klab missile systems and Resurs anti-aircraft complexes, which have a modular construction. "Currently, such a variant of the ship's armaments is being developed, with the next series coming out already with the new weapons," Mistakhov was quoted by RIA Novosti news agency as saying. In his opinion, the Project 22160 ships are a very good platform in terms of seaworthiness, fishability, range or speed of travel. In mid-June, reports emerged that the series of Project 22160 patrol vessels will not be continued because Russian military representatives are unhappy with their characteristics. Among the shortcomings were named insufficient seaworthiness, light armour, propulsion system vulnerability and weak anti-aircraft weapons. The Project 22160 series is currently limited to six ships, all of which are destined for the Russian Black Sea Fleet. Four of the ships are already in combat service, and two more will be commissioned this year and next. Following the launch of the special military operation in Ukraine, Tor-M2KM air defence systems were installed on these ships to compensate for the lack of air defence. The Project 22160 patrol vessels have a displacement of 1,700 tonnes and are capable of speeds of 30 knots. Sailing range is 6,000 miles and range 60 days. The standard crew is 28, but can be increased to 80. Ka-27PS helicopters can be deployed on board. The ships' basic armament is a 76-millimetre calibre artillery installation and several machine guns.

Author's comment: The novelty of the Project 22160 patrol ships is the modular design of the armaments. According to the Russian military, in this way the ships can be adapted to the mission they are to perform. Among other things, they feature the Kalibr cruise missile complex, consisting of two launch facilities with four cells each. However, participation in the conflict with Ukraine has shown that ships of this type are extremely vulnerable, with virtually no air defence. As a result, they can be easy targets for an adversary's drones or anti-ship missiles. As regards the Resurs anti-aircraft missile complex, it should be noted that this is a new weapon, which was presented for the first time at the MVMS-2021 international exhibition. It is produced by the Altair Technical and Scientific Centre of the Almaz-Antey aerospace company. The complex employs 9M96 and 9M100 anti-aircraft missiles designed to protect surface ships against aerial attacks by drones and manned aircraft, including those flying at extremely low altitudes.

Source: https://www.defenseromania.ro/la-loc-comanda-rusii-vor-continua-sa-produca-navele-proiect-22160-dar-le-vor-schimba-armamentele_617766.html

Russians feverishly search for weapons for war with Ukraine

A merchant ship subject to US sanctions passed through Turkey's Bosphorus Strait on its way from Syria to Russia late last month. European intelligence officials tracking the Sparta II say it was carrying military vehicles to support Vladimir Putin's war in Ukraine. The ship's journey to the Black Sea port of Novorossiysk points to Kremlin efforts to attract resources for the invasion now in its sixth month as supply lines strain under the pressure of Europe's biggest military campaign since World War II. While Ukraine has received billions of dollars worth of weapons from the US and Europe to defend itself, Russia has to rely on its own resources to sustain frontline forces amid reports of heavy losses. Tens of thousands of Russian soldiers have been killed or wounded and thousands of armoured vehicles have been destroyed, according to US estimates. An official familiar with the matter said the US government believes Russia has used merchant ships to move military cargoes into the Black Sea, echoing European intelligence reports. The official asked not to be identified, discussing confidential matters. The Sparta II almost certainly brought military vehicles from the port of Tartus in Syria, which is used by Russia, according to intelligence officials and satellite imagery from July 17-25 seen by Bloomberg. They said the exact nature of the vehicles is unclear. The ship was seen in Syria with vehicles in its hold, was spotted crossing the Bosphorus Strait and was later identified in Novorossiysk with at least 11 vehicles it was likely unloading. Interestingly, the ship's owner is the German company SLOMAN NEPTUN of Bremen, Germany. Maritime tracking data shows that the vessel owned by a US-sanctioned company in May, controlled by the Russian Ministry of Defence, made the voyage on those dates, apparently unhindered by NATO member Turkey.

Turkish reaction

Ankara invoked the Montreux Convention to close the strait to warships shortly after Putin's invasion on 24 February, even though commercial shipping can pass through. Russia has used Oboronlogistika OOO cargo ships on the same route on other occasions this year, according to people. It has transported military cargo from Russia to Syria several times in the past. A US State Department spokesman referred questions on the matter to the Turkish government. A Turkish official familiar with the matter said a merchant ship is only examined if there is intelligence or a suspicion of wrongdoing. To be sure, Russia has amassed massive stockpiles of weapons during a decade-long modernization program overseen by Putin, and Kremlin officials deny any refueling problems. However, US and European officials say the loss of large numbers of tanks and armoured personnel carriers is forcing Moscow to draw on

stocks of older equipment, including decades-old T-62 tanks. Like Russia, Ukraine has not disclosed the extent of its military losses, though it faced logistical challenges against a much larger enemy, especially early in the war. President Volodymyr Zelenskiy said in a July 22 interview with the Wall Street Journal that battlefield casualties have dropped to about 30 a day from a high of 100-200 a day in May-June, a number that has not been independently verified. Experts explain where the great vulnerability of Russian weapons lies. Putin has had troops in Syria since he ordered an operation in 2015 to support Bashar al-Assad. Russian Defense Minister Sergei Shoigu said in 2017 that the military has tested more than 160 types of advanced weaponry there, including fighter jets, laser-guided missiles, tanks, electronic warfare methods and air defense systems. The Kremlin has also sought additional resources elsewhere. In recent weeks, tensions between Armenia and Azerbaijan over the disputed Nagorno-Karabakh region have escalated amid reports denied by Moscow that Russia has scaled back its peacekeeping presence by up to 2,000 troops to send troops into Ukraine. In March, the US said Russia had diverted some troops to Ukraine from the breakaway Georgian region of South Ossetia, where it has kept thousands of troops since the 2008 war. Russia is now turning to Iran to try to buy armed drones, CIA Director William Burns told a US security forum last month, saying this points to "the shortcomings of Russia's defence industry today and the difficulties it faces after significant losses". Russian shipments from Syria are likely to feed its overall logistics, as Novorossiysk is used to resupply bases in neighbouring Crimea, annexed by Putin in 2014, and from there to occupied Kherson and Zaporozhye in southern Ukraine, one European intelligence official said. Russia has recently redeployed forces and equipment to the area as Ukraine threatens a counter-offensive in the Kherson region. Russia has moved a significant number of troops into Crimea to prepare for deployment in southern Ukraine, and at least eight battalion battalions comprising between 800 and 1,000 troops have been moved out of eastern Donbas, increasing pressure on its logistical supply routes, the person said.

Ukrainian advantages

The Pentagon says it has provided \$9.1 billion in defense assistance to Ukraine since February, including \$1 billion announced Monday to boost deliveries of long-range artillery ammunition, anti-tank weapons and medical vehicles. The government in Kiev also received another billion in weapons from Britain and other North Atlantic Treaty Organisation allies. Ukrainian forces using US-supplied HIMARS long-range artillery have recently targeted Russian supply lines and ammunition depots behind the front with increasing effectiveness, as well as key infrastructure. "Western arms deliveries allow Ukraine to hit bridges, which complicates logistics and supply," said Igor Korotchenko, head of the Moscow-based World Arms Trade Analysis Centre. "However, artillery and attack aircraft are the key weapons in the current offensive and we are not lacking either." Up to 80,000 Russian soldiers have been killed or wounded in the war, US undersecretary of defense for policy Colin Kahl told a regular Pentagon briefing on Monday. The US assessment was also that Russia used a significant percentage of its precision-guided munitions, including air- and sea-launched missiles, and lost up to 4,000 tanks and other armored vehicles, he said. "A lot of that is due to anti-armor systems like the Javelin, like the AT4, but also, frankly, to the creativity and ingenuity in the way the Ukrainians used those systems," he said. Putin has not sought to strengthen his military by ordering a mass mobilisation, perhaps because that would risk forcing the Russian public to confront the costs of a war he has kept at arm's length until now. But regional officials have offered cash incentives to encourage people to volunteer on short-term contracts, while the lower house of parliament in May abolished an upper age limit for military service.

Also last month, the Russian government moved to boost arms production by easing some workforce regulations at defence companies, citing "increased short-term need to repair weapons and military equipment".

Source: https://www.dcbusiness.ro/rusii-cauta-febril-armament-si-tehnica-de-lupta-de-unde_647008.html

Lockheed Martin delivers HELIOS laser weapon system to US Navy

Lockheed Martin has delivered to the U.S. Navy a 60+ kW class high-energy laser with integrated optical orbiting and surveillance system (HELIOS), the first tactical laser weapon system to be integrated into existing ships and provide directed energy capability to the fleet. Integrated and scalable by design, the multi-mission HELIOS system will provide a tactically relevant laser weapon system combat capability as a key element of a layered defense architecture. HELIOS is a new additive weapon system that provides an additional layer of fleet protection, reduced cost per hit, light delivery speed and precision response. Naval News understands that a Lockheed Martin HELIOS laser weapon system will be installed aboard the USS Preble during an available depot maintenance period (DMP). The Pearl Harbor destroyer will be the first of its kind to be equipped with a high-energy laser to counter surface craft and unmanned aerial systems.

Source: <https://www.navalnews.com/naval-news/2022/08/lockheed-martin-delivers-helios-laser-weapon-system-to-u-s-navy-2/>

Submarines and aircraft carriers? Upcoming French Navy deployments to the Pacific

Marine Nationale plans to deploy more state-of-the-art assets to the Indo-Pacific in the coming years. These would include nuclear attack submarines (SSN), an air defence frigate, a helicopter carrier (LHD) and even possibly nuclear-powered aircraft carriers.

Source (continued): <https://www.navalnews.com/naval-news/2022/08/submarines-and-carriers-upcoming-french-deployments-to-the-pacific/>

Questions and answers about the future of the US Navy's amphibious fleet

Online media reporters were allowed to ask questions of Captain Brad Busch, U.S. Navy, Deputy Director, Expeditionary Warfare (N95), at the May 3, 2022 Surface Navy Association 2022 (SNA 2022) Waterfront Conference. Naval News generalized, summarized and edited most of the media questions and answers for readability length addressed to Deputy Director N95 in "Future of the [U.S. Navy's] Amphibious Fleet." Naval News Comments have been added for speculative discussion purposes and for reference and additional information.

Source: <https://www.navalnews.com/naval-news/2022/08/future-of-the-u-s-navys-amphibious-fleet/>

China redeploys top ships to Taiwan Strait

As tension along the Taiwan Strait continues to deepen, China has promoted Coast Guard Chief Wang Zhongcai to naval commander in charge of the East China Sea and Taiwan Strait. They have taken this step as China continues its relentless efforts to escalate military exercises in the region. According to Chinese media, Major General Wang Zhongcai recently attended a meeting in Ningbo in his new capacity as commander of the Chinese Navy's Eastern Theater Command. Since US House Speaker Nancy Pelosi visited Taiwan earlier this month, China's military activity towards Taiwan has increased. It conducted large-scale military exercises around Taiwan between 4 August and 10 August, which many Western observers find quite telling. On Monday, coordinated with a second visit by members of the US Congress, China's People's Liberation Army, Ministry of Defense and Eastern Theater Command announced additional exercises in the seas and airspace around Taiwan. Major General Wang Zhongcai has had a distinguished career in China's Coast Guard, overseeing several incursions into the Japanese-administered Senkaku Islands. Wang's promotion to the top naval post in the East China Sea could give him more power to add military pressure on Taiwan and Japan. Wang Zhongcai joined the Navy's Coast Guard in 2018, helping lead historic reforms. During his tenure, Beijing modernized the Coast Guard, giving it power on par with the military. A new policy has come into force that allows the Coast Guard to use force when China's sovereignty is violated by foreign vessels. The Coast Guard Command has also been placed under the Central Military Commission, which is China's top military decision-making body. Meanwhile, Mei Wen, who served as political commissar on China's first aircraft carrier, the Liaoning, has also been transferred to the Eastern Theater Command, still as political commissar. In the position, which is considered equal to that of commander, he will work alongside Zhongcai. "China has decided to deploy top talent to the areas facing the most intense tensions. It may seek to operate an aircraft carrier around Taiwan," said Yasuyuki Sugiura, a senior researcher at Japan's National Institute for Defense Studies. Other analysts in the region believe Pelosi's visit may have given China the one opportunity it has been waiting for to increase its bellicosity toward Taiwan. The reorganisation of the Eastern Command's naval leadership may be the first manifestation of this.

Source: <https://www.maritime-executive.com/editorials/china-redeploys-top-naval-leaders-in-the-taiwan-strait>

Conversion to hydrogen-powered barge begins

The first barge owned by the Dutch company, Future Proof Shipping, has arrived at a shipyard in the Netherlands to begin a conversion from traditional diesel propulsion to become one of the first ships operated with hydrogen and fuel cell propulsion. The company has announced plans to convert three ships to zero-emission technology. FPS Maas, built in 1993 and acquired by the company in 2020, made its last voyage on diesel and an internal combustion engine from Belgium to Rotterdam. She arrived at the Holland Shipyards Group shipyard in Werkendam on 15 August, where modernisation work is due to begin to turn her into a zero-emission ship. "In the coming months, the engine will be removed and a hydrogen and fuel cell propulsion system will be installed," the company said in a social media post. A complicated project, which is also seen as a technology demonstration, was first announced in March 2021, but is a year behind schedule while the technology has been developed. When the retrofit is completed in December, the ship which will have a cargo capacity of 200 TEU is expected to sail 100% on hydrogen. Once back in service, the container ship operating along the busy inland waterways of Rotterdam and Antwerp of about 150 miles will reduce

reenhouse gas emissions by 2,000 tonnes CO₂e annually. The modernisation project will involve the removal of both the main engine and the ship's 360-foot gearbox and the installation of a new modular propulsion system. It will consist of electric motors, hydrogen tanks, a PEM fuel cell system (needed to convert hydrogen into electricity) and a battery system. The compressed hydrogen tanks, fuel cells and battery system are separate units that can be removed for maintenance or replacement. The hydrogen and fuel cell system will be installed in the ship's cargo space, with the hydrogen placed above the fuel cell system in two 40-foot containers. The fuel cell system will be triple redundant, with a capacity of 825 kW (to provide propulsion and auxiliary power) and a 504 kWh lithium-ion battery pack for maximum power. The system will contain a 750 V DC busbar and an electric motor for propulsion. FPS acquired two additional inland vessels in October 2021 that it plans to convert to hydrogen propulsion. The company aims to operate a fleet of 10 zero-emission inland and short-sea vessels over the next five years. Earlier this year, the Netherlands awarded the first licence to IJmond Environmental Service on behalf of the municipality of Velsen to use hydrogen as bunker fuel. Windcat Workboats has loaded hydrogen on board its first hydrogen-powered CTV Hydrocat 48. The vessel which was delivered this spring is used to transport crew to and from the port of Ijmuiden to the 44 Vestas turbines that make up the Belgian Norther wind farm. Source: <https://www.maritime-executive.com/article/conversion-begins-for-hydrogen-powered-inland-barge> . Shell Prelude FLNG plant remains offline as union extends strike. Shell remains in a protracted labour dispute. The company confirmed today that the union has notified it that it intends to extend its current strike until September 1, meaning the operation that has been shut down since July 25 will remain offline for at least two weeks and possibly longer. "The Offshore Alliance and ETU members of penava Prelude are in their 70th day of protected industrial action in our EBA campaign for job security and Tier 1 rates and conditions. Shell has torched an estimated \$1.3 billion of production in a dispute that has stalled production and prevented any takeover for over 5 weeks. No company in Australia's history has lost so much money in a bargaining dispute," wrote the union which announced the strike extension. Shell said in July, when they announced they were being forced to suspend operations, that it had offered its unionised workforce a \$20,000 pay rise on top of the current average wage of \$140,000. However, the union says it also wants job security guarantees to prevent Shell from outsourcing work to contractors. Its 150 members rejected the wage offer by a wide margin. "Our Prelude members have drawn a line in the sand on job security and this week supported the extension of Protected Industrial Action until our bargaining demands are resolved," the union said in its latest social media post. "The Offshore Alliance and ETU will go one day stronger and one day longer!" The labor dispute began in June with the union initially stopping work for one hour at a time or intermittent strikes. The union took the matter to the Australian Fair Work Commission, which approved the work stoppage. After eight years of planning, Shell, which is partnering with INPEX, KOGAS and OPIC on the project, completed the transport of liquefied natural gas left from the Prelude floating liquefied natural gas unit in June 2019. It is located approximately 300 miles away. Northeast of Broome in Western Australia. Plans called for the plant to have an annual capacity of around 3.6 million tonnes, but in reality the troubled plant has rarely fulfilled its expected potential. It has been plagued by failures, including a small fire in December 2021 that caused a three-day power outage. It had been operating steadily since April until this latest union dispute. For its part, Shell confirmed it had been notified of the extension by the union. The company was scheduled to begin an extended maintenance program known in the industry as a turnaround in September. Shell now says it plans to postpone that work until sometime next year. The company hopes to bring the unit back online to help meet global LNG demand and especially in East Asia, which has been hit hard by the shutdown. Source: <https://www.maritime-executive.com/article/shell-s-prelude-Ing->

facility-remains-off-line-as-union-extends-strike Maersk signs \$500 million deal with Suez Canal Authority to build berth at eastern port . The Suez Canal Authority (SCA) has struck a \$500 million deal with renowned Danish shipping company Maersk to build a berth at East Port Said, news websites report. The project is expected to add a 1km dock to the 500m quay at the East Port's container terminal. The project is likely to add to the number of cranes, increasing the number to 30. They will be powered by electricity instead of diesel to reduce emissions. Maersk is considering a strategy to transform the port into a smart port terminal that is operated with up-to-date digital systems. The authority has discussed this plan with Maersk's board of directors.

The Suez Canal hit a new record in July 2022, reaching its highest revenue ever at \$704 million. The monthly transit rate through the Suez Canal rose to historic levels after 2,103 ships were observed with an exclusive tonnage of around 125.1 million tonnes. In a separate development, Reuters reported that Egypt yesterday signed two interim agreements to develop unnamed port services and facilities. The contracts are with a consortium comprising Hong Kong's Hutchison Ports, France's CMA CGM and a Chinese shipper named Cosco. She added that the agreements could lead to investments of up to about \$800 million.

Source: <https://www.marineinsight.com/shipping-news/maersk-strikes-a-fruitful-deal-with-suez-canal-authorities/>

Turks come to Russia's rescue in big Arctic LNG project

Major Western companies are pulling out of Novatek's big Arctic LNG 2 project. Turkish companies, including Karpowership, seem ready to take their place. Unprecedented Arctic industrialisation, which has been taking place along the shores of Russia's remote Gulf Ob in recent years, is facing serious problems in the wake of Russia's war against Ukraine and the subsequent introduction of Western sanctions. Novatek's major liquefied natural gas projects in the area are all heavily dependent on Western technology, and a complete halt to development now threatens the latest project, Arctic LNG 2. Novatek will not be able to complete the project as planned following the departure of Baker Hughes, as well as Saipem and Technip. But help may be on the way from Putin-friendly Turkey. Karpowership, the Turkish engine manufacturer, is reportedly in talks with Novatek to build a 300-400 MW floating power plant that can supply power to the first of the project's three trains. According to Kommersant, Novatek has no choice but to contract the Turkish company. There are simply no other options available on the market. It is believed that the engine can replace the turbines that were originally to be supplied by Baker Hughes. The US company was to build 20 LM9000 turbines for Arctic LNG 2, seven of which will be applied to the first train of the project. Only four of the turbines were delivered before Western sanctions were hit and Baker Hughes pulled out of Russia. The last of them was shipped to the Belokamenka Yard outside Murmansk on 25 May. The four turbines delivered will be used for the gas liquefaction process, while the Karpowership engine will generate the necessary power, Kommersant reports. Karpowership has built 25 engines since 2010 that today supply power to countries with poorly developed energy systems. Vessels of this type now operate in ten African countries, as well as in the Middle East and Latin America. The ships are floating power plants mounted on barges or ships that can run on heavy fuel oil, diesel or natural gas. Novatek faces serious difficulties. Key parts of the gravity structures applied in Arctic LNG are designed by the French company Technip. Another key partner was Saren B.V., a joint venture of Italian engineering company Saipem and Turkish company Renaissance Heavy Industries. Both Technip and Saipem have now left Arctic LNG 2, and Novatek has replaced them with Nova Energies and Green Energy Solutions, Kommersant reports. The former

company is a subsidiary of Russia's Nipigaz, while the latter is a brand new company registered in the United Arab Emirates. Also, the Chinese shipyard producing the upper modules of the gravity structures has decided to cease cooperation with Novatek in the project. The consequences could be dramatic for places like Murmansk, where Novatek is building the huge gravity structures. Belokamenka Court could eventually be turned into a ghost town if the huge Arctic LNG 2 project were to stop completely.

Source: <https://thebarentsobserver.com/en/arctic-lng/2022/08/turks-are-coming-russias-rescue-large-arctic-lng-project>

Grand jury indicts seven in fraudulent extortion scheme at Port of San Juan

A federal grand jury in Puerto Rico has returned an indictment charging seven people with racketeering crimes at work at the Port of San Juan. The seven defendants are accused of running a criminal enterprise that induced and misled shipping companies to pay fees for loading and unloading cargo at the port under threat of strikes and blockades by union members. Defendants also made false claims that companies had to pay a fee in order to use "non-union labor" to load and unload cargo. Total losses exceeded \$1.1 million. Pedro Pastrana-González and his ex-wife, Iara Clemente-Rivera, who owned and operated JCPY, Inc. were aided by a public employee and worker for the Puerto Rico Port Authority, Jorge Batista-Maldonado, and Carlos Sánchez-Ortiz, president of the ILA-1740 union of the International Association of Liquidators. The indictment accuses them of executing the fraudulent extortion scheme against shipping companies using Piers 9, 10 and 11 at the Port of San Juan. Members of the enterprise took some of the money they made from the scheme and hid it in JCPY and as payments to the ILA-1740 employee benefit plan. Pastrana-González, Clemente-Rivera, Victor F. Torres-Barroso, José A. Fernández-Cruz and Carlos A. Hernández-Laguer are also charged in the indictment for their participation in a kickback scheme and falsifying employee benefit records. Pastrana-González and Clemente-Rivera agreed that Torres-Barroso, Fernández-Cruz and Hernández-Laguer - members of ILA-1740 who worked for a company that provided stevedoring services - would make "chimbo" for Clemente-Rivera. "Chimbo" is slang for a person who uses another person's union card when working on the docks so that it looks like the union member is working. Because it appeared that Clemente-Rivera was working even though she wasn't, the hours she worked were fraudulently counted toward her annual hours requirement to qualify for employee benefits. Charges included in the indictment include a RICO conspiracy, a Hobbs Act extortion conspiracy, conspiracy to commit mail and wire fraud, conspiracy to violate the Taft-Hartley Act related to labor-management relations, money laundering, conspiracy to willfully convert funds and falsify records, and health care fraud. "These arrests are the result of a comprehensive investigation that will now put an end to the illegal fees the defendants charged shipping companies at Piers 9, 10 and 11," said W. Stephen Muldrow, Puerto Rico District Attorney. The indictment includes a forfeiture charge related to the total value of the loss, at approximately \$1,184,524.26, and a residential property, a vehicle and a boat. "These fraudulent actions resulted in people improperly receiving benefits for which they were not eligible, hurting thousands of Puerto Ricans who worked tirelessly to earn these benefits honestly and legally," said Ali Khawar, Acting Assistant Secretary of Labor, Employee Benefits Security Administration (EBSA). "When someone commits a crime involving an employee benefit plan, EBSA will make sure they are brought to justice."

Source: <https://gcaptain.com/grand-jury-charges-seven-over-fraudulent-extortion-scheme-at-port-of-san-juan/>

The search for a fully self-sufficient vertical shrimp farm

A commercial-scale, modular, stacked aquaculture system that is capable of producing between 50 tonnes of shrimp per year with minimal human intervention will be operational in Singapore in 2023. Created by Vertical Oceans - a startup formerly called Aqualogix - the system was developed by John Diener and co-founder Enzo Acerbi. John worked in the conventional shrimp sector for Gold Coin and SyAqua until 2016. "At that time, I visited hundreds of shrimp farms in Asia and kept seeing a similar pattern, where these farms dump raw effluent into the ocean, their intake is not far off, they start having problems with bacterial and other diseases, some of them were using antibiotics. I had this cognitive disconnect with what was going on because I fundamentally believe that aquaculture is a very good food production model, but not the way it was done," he explained to delegates at the Blue Food Innovation Summit. As a result, he started thinking about how to use technology to make aquaculture more efficient and sustainable. John Diener head shot John Diener, co-founder of Vertical Oceans Diener's prototype can produce 3 tonnes of shrimp a year and he plans to expand to a 50-tonne capacity system in the first half of 2023 © Vertical Oceans "We ended up inventing our own system - which starts with a production module that we call intelligent habitat or iHAB," he added. Diener's prototype of the system - which he built in Singapore - has the capacity to produce 3 tonnes of shrimp per year, while he plans to expand to a 50-tonne capacity system in the first half of 2023. It is described by Diener as "a fully autonomous, fully self-contained, multi-trophic system" - producing sea grapes as well as shrimp. And he stresses the need to ensure a carefully managed microbial community using metagenomics - both to optimise both the health and taste of the shrimp. Technology - half of which is owned by Vertical Oceans - is also at the forefront: a series of sensors control aspects such as feeding and pumping speed, while all data is fed through algorithms to improve production efficiency over time. iHAB system.

Source and Continued:

<https://thefishsite.com/articles/the-quest-for-a-fully-autonomous-vertical-shrimp-farm-vertical-oceans>

Aqua-Spark and chemical giant partner to invest in seaweed firm

BASF Venture Capital is the corporate venture arm of chemical major BASF SE. BASF has joined forces with Aqua-Spark* to invest in Sea6 Energy's Series-B. Sea6 Energy was founded in 2010 and is based in Bangalore, India. The company specialises in the production and processing of tropical red algae. Other existing investors include Tata Capital Innovations Fund. With this investment, Sea6 Energy will complete its Series B transaction of \$18.5 million in total. Red algae grows primarily in tropical waters in Asia, which have constant, high temperatures that favor year-round growth of seaweed. Biomass from fast-growing red algae is suitable as a feedstock for a variety of applications such as animal feed and fertiliser. It can also be used as a gelling agent in the food industry or as an ingredient in cosmetics. Although seaweed cultivation is expanding in Asia and Europe, it has been difficult for seaweed producers to achieve economies of scale. Large-scale commercial offshore cultivation is complex, and technical systems must withstand adverse weather conditions such as storms and waves.

Source and continued: <https://thefishsite.com/articles/aqua-spark-and-chemicals-giant-partner-to-invest-in-seaweed-firm>

Is krill fishing accelerating climate change?

Krill are marine invertebrate animals. These crustaceans are an important part of zooplankton, the daily food of animals such as whales, rays, sharks and crabs. In addition to these marine life, there are some birds and seals that feed mainly on krill. The name 'krill' comes from the Norwegian word for 'baby fish', but the term is also used for other marine species, especially fish. Krill are found in all the oceans of the Earth. These creatures are of particular importance because they are the first link in the food chain composed of larger marine animals, and thus constitute their staple food. Aker Biomarine, which prides itself on being one of the world's most sustainable fishing companies, insists its sustainability claims are based on science, not greenwashing, after the publication of a new report criticising krill fishing in Antarctica. The report, by the Changing Markets Foundation, criticises the increasingly widespread trade in krill for use in food supplements and aquatic feeds. According to the Netherlands-based NGO, krill is "essential for the health of the planet and helps slow climate change by removing the equivalent of emissions from 35 million cars each year from the atmosphere." "This summer's heat waves and drought are a wake-up call that the climate emergency is upon us. Krill are not only amazing animals for their crucial role in Antarctic food webs, they also help combat climate change. By continuing to sell krill-fed farmed salmon and expensive krill oil supplements, the top supermarkets are complicit in depleting the main food source for whales, seals and penguins, animals already under extreme pressure from global warming," said Sophie Nodzinski, lead campaigner. at the Changing Markets Foundation, in a press release.

Source and Continued: <https://thefishsite.com/articles/is-krill-fishing-accelerating-climate-change>