



The UPM Market Informer



Inside This Issue

| | |
|---------------------------------------|---|
| Surcharge Update..... | 2 |
| Boeing Illinois Stingray Factory..... | 3 |
| Ubiquity Solar Campus | 3 |
| U.S. Army Tactical Radios..... | 4 |
| NASA Orion Spacecraft Engine..... | 4 |
| Texas Power Rankings..... | 5 |
| International Space Command..... | 5 |

Tesla's Battery Manufacturing Megafactory Breaks Ground in California

Tesla broke ground on its "Megafactory," a new production facility in California, so christened because it will produce the company's large-scale battery system Megapack. News of the previously unannounced factory was confirmed by the Lathrop Mayor Sonny Dhaliwal in a Facebook post that was deleted and re-posted. "We are proud to be the home of the Megafactory, Tesla's most recent expansion here," he said. "The future of green energy will be produced right here in our community."

The factory, in the small northern California city of Lathrop, is near Tesla's automotive plant in Fremont. Lathrop is also home to Tesla's 870,000-square-foot distribution center. Megapacks, as well as Tesla's other energy storage products, were being manufactured at the electric automaker's so-called "Gigafactory" in Sparks, Nevada. This is the first facility dedicated to the Megapack, though it's unclear if production of Tesla's other storage products — which include Powerwall and Powerpacks — will shift to the new factory.

The new factory is a positive signal for the automaker's growing Energy division. As opposed to the Powerwall, which is a home consumer battery product, the Megapack is meant for utility-scale energy storage. Utilities building solar and wind farms are increasingly pairing these with large batteries to store excess energy to discharge to the grid later. Just last week, the Arizona electric utility Salt River Project brought online a 100 megawatt-hour Megapack project.

In a second-quarter earnings call in June, CEO Elon Musk confirmed that there was "significant unmet demand" for these storage products, adding that the Megapack was "basically sold out through next year." He also estimated demand for Powerwall to be in excess of 1 million units per year. Much of the bottleneck isn't merely due to production capacity — Musk also told investors that cell supply and the global semiconductor shortage were creating production ceilings.

"We use a lot of the same chips in the Powerwall as you do in a car, so it's like, which one do you want to make?" he said. "Cars or Powerwalls? So we need to make cars, so that will — Powerwall production has been reduced."

The chip shortage, however, seems to show no signs of abating; in fact, the White House on Thursday will be hosting its second summit with semiconductor manufacturers and purchasers to address the ongoing effects on the technology and auto industries.

Source: TechCrunch, photo credit Sonny Dhaliwal

Surcharge Totals July - December 2021



| | July | Aug | Sept | Oct | Nov | Dec |
|--------------|---------|---------|---------|--------|--------|--------|
| 15-5 | 0.7951 | 0.8233 | 0.8464 | 0.8336 | * | * |
| 15-7 | 1.1805 | 1.2887 | 1.3212 | 1.3395 | * | * |
| 17-4 | 0.7886 | 0.8133 | 0.8344 | 0.8208 | * | * |
| 17-7 | 0.9459 | 0.9949 | 1.0341 | 1.0288 | * | * |
| 201 | 0.7749 | 0.8189 | 0.8613 | 0.8645 | * | * |
| 301 7.0% | 0.9356 | 0.9838 | 1.0221 | 1.0164 | * | * |
| 302/304/304L | 1.0180 | 1.0699 | 1.1129 | 1.1092 | * | * |
| 304-8.5% | 1.0530 | 1.1068 | 1.1521 | 1.1494 | * | * |
| 305 | 1.3042 | 1.3709 | 1.4330 | 1.4365 | * | * |
| 309 | 1.3475 | 1.4139 | 1.4760 | 1.4803 | * | * |
| 310 | 1.8625 | 1.9547 | 2.0500 | 2.0673 | * | * |
| 316/316L | 1.4502 | 1.5713 | 1.6204 | 1.6454 | * | * |
| 316LS/316LVM | 1.9600 | 2.0900 | 2.1900 | * | | * |
| 317L | 1.7036 | 1.8590 | 1.9111 | 1.9512 | * | * |
| 321 | 1.0785 | 1.1324 | 1.1812 | 1.1793 | * | * |
| 347 | 1.3841 | 1.4396 | 1.4874 | 1.4855 | * | * |
| 409/409 Mod | 0.3705 | 0.3918 | 0.3977 | 0.3784 | * | * |
| 410/410S | 0.3774 | 0.4001 | 0.4051 | 0.3858 | * | * |
| 430 | 0.4330 | 0.4553 | 0.4603 | 0.4420 | * | * |
| 434 | 0.5519 | 0.5974 | 0.6011 | 0.5923 | * | * |
| 439 | 0.4493 | 0.4692 | 0.4756 | 0.4577 | * | * |
| 440A | 0.4330 | 0.4553 | 0.4603 | 0.4420 | * | * |
| 2205 | 1.3576 | 1.4921 | 1.5199 | 1.5531 | * | * |
| 263 | 8.2475 | 7.7472 | 7.8493 | 8.3874 | 9.2311 | 9.6255 |
| 276 | 6.5237 | 6.4275 | 7.1446 | 8.2827 | 8.6095 | 8.8924 |
| A286 | 2.0210 | 2.0153 | 2.1878 | 2.3119 | 2.4466 | 2.5086 |
| 330 | 2.5437 | 2.5474 | 2.7587 | 2.8333 | 3.0213 | 3.0857 |
| 400 | 4.8402 | 4.8974 | 5.4125 | 5.4418 | 5.7343 | 5.8405 |
| Custom 455 | 1.0300 | 1.1000 | 1.1500 | * | * | * |
| Custom 465 | 1.3900 | 1.4700 | 1.5400 | * | * | * |
| 600 | 4.8973 | 4.9049 | 5.3459 | 5.5073 | 5.8693 | 6.0048 |
| 601 | 4.2425 | 4.2486 | 4.6100 | | 5.0591 | 5.1704 |
| 617 | 7.3395 | 7.0459 | 7.4162 | 8.1455 | 8.7649 | 9.0879 |
| 625 | 6.8490 | 6.8007 | 7.3522 | 8.1255 | 8.4406 | 8.6431 |
| Custom 630 | 0.9100 | 0.9600 | 1.0100 | * | * | * |
| 718 | 6.4667 | 6.4511 | 6.8313 | 7.2706 | 7.5349 | 7.6654 |
| X-750 | 5.4539 | 5.4597 | 5.8895 | 6.1457 | 6.4914 | 6.6284 |
| 825 | 3.2981 | 3.2836 | 3.5974 | 3.8829 | 4.0880 | 4.1968 |
| HX | 4.4855 | 4.4236 | 4.8922 | 5.5163 | 5.7905 | 5.9763 |
| 188 | 9.7900 | 11.7800 | 12.6600 | * | * | * |
| CCM | 13.4400 | 17.5200 | 17.5500 | * | * | * |
| L-605 | 11.0500 | 13.4200 | 14.3700 | * | * | * |

*Surcharge currently not available



Boeing to Build Illinois Factory to Produce MQ-25 Stingray

Boeing will build the U.S. Navy's MQ-25 Stingray unmanned aerial refueler at a new 300,000 square ft. facility at MidAmerica St. Louis Airport in Illinois. The facility will feature state-of-the-art manufacturing processes and tools, including robotic automation and advanced assembly techniques, to improve product quality and employee ergonomics.

The new facility, scheduled for completion in 2024, initially will employ approximately 150 mechanics, engineers, and support staff who will build the MQ-25 Stingray, the Navy's first operational, carrier-based

unmanned aircraft. Employment could reach up to 300 with additional orders.

"The world's largest aerospace company is doubling down on Illinois because of our unparalleled assets in the transportation and logistics sector and the world-class talent of our people," said Gov. JB Pritzker. "To prepare our communities for the future, my administration is committed to making continued investments that will modernize our airports, spark new innovation, and bring jobs and economic opportunities to our communities from Chicago to St. Clair and beyond."

Boeing digitally engineered the entire MQ-25 aircraft and its systems, resulting in high-fidelity models that are used to drive quality, efficiency, and flexibility throughout the production and sustainment process.

"The team and state-of-the-art technology we're bringing to the Navy's MQ-25 program is unprecedented, and we're incredibly proud to be expanding both as we build the future of autonomous systems in Illinois," said Kristin Robertson, vice president and general manager of Autonomous Systems, Boeing Defense, Space & Security. "We've received great support from MidAmerica Airport and countless dedicated employees, and we're excited to build the Navy's first operational, carrier-based unmanned aircraft right here in the Metro East."

For two years, Boeing and the Navy have been flight testing the Boeing-owned MQ-25 test asset T1 from MidAmerica Airport, where in recent history-making missions T1 has refueled an F/A-18 Super Hornet, an E-2D Hawkeye, and an F-35C Lightning II.

The U.S. Navy intends to procure more than 70 MQ-25 aircraft to help extend the range of the carrier air wing, and the majority of those will be built in the new facility. Boeing is currently producing the first seven MQ-25 aircraft, plus two ground test articles, at its St. Louis facilities, and they will be transported to MidAmerica for flight test. The MQ-25 program office, including its core engineering team, will remain based in St. Louis.

The new MQ-25 facility will be in addition to existing manufacturing operations at Boeing St. Clair, which produces components for the CH-47 Chinook, F/A-18 Super Hornet, F-15, and other defense products. *Source: Eric Brothers for Aerospace Manufacturing and Design, photo credit Boeing*

Governor Hochul Announces Plans for Ubiquity Solar to Establish U.S. Manufacturing Operations at Former IBM Huron Campus in Broome County

Governor Kathy Hochul today announced that Canadian firm Ubiquity Solar Inc. will establish its U.S. solar photovoltaic manufacturing operations at the former IBM site in the village of Endicott in Broome County. For the initial phase of the project, the company expects to repurpose 800,000 square-feet of space at the former campus, representing an approximately \$61 million investment, including site renovations, equipment, and installation.

"The Southern Tier has become a hub for next generation energy research, innovation and advanced manufacturing, and Ubiquity Solar's decision to establish its U.S. operations in Endicott is yet another indicator of the region's bright future," Governor Hochul said. "It is through forward-thinking projects like this that we are helping to spur economic development across Upstate New York, ensuring a more sustainable future for generations to come."

Additionally, Ubiquity Solar has expects to create up to 150 highly skilled jobs in the region. With the site redevelopment already underway, the company expects to be fully operational at the Endicott campus by the end of 2022. [More on this story](#) *Source: New York State*

US Army Moves to Full-Rate Production On Tactical Radios Essential for Multidomain Operations

The Army has awarded a full-rate production contract for a series of tactical radios critical to allowing forces multiple options for communication in a highly congested and dynamic operating environment.

The orders are for the 2-Channel Manpack and Leader radios, according to an Army release, and will support the Army's overarching network modernization strategy — the unified network — by providing communications options and flexibility to upgrade waveforms as new technology emerges.

As the Army modernizes its tactical network, service leaders have said the need to be resilient and have multiple paths of communication is critical. They anticipate adversaries will seek to jam or deny communications, meaning forces will need reliable alternatives to communicate and pass data back and forth in a dispersed manner on the battlefield.

The Manpack radio award, worth approximately \$226.5 million, is for 2,320 radios from L3Harris Technologies and 1,547 radios from Collins Aerospace. The Leader radio award totals \$118.7 million and includes 2,498 radios from L3Harris and 1,096 radios from Thales. The Manpack radios provide beyond line-of-sight capability using the Mobile Objective User System, which allows for global voice calls over the radio through satellite communications.

The Army has been using a series of experiments over the last few years with 1st Brigade Combat Team, 82nd Airborne Division as part of its modernized tactical network approach, which includes the incremental delivery of capabilities every two years under what it calls capability sets. Capability Set '21 sets the baseline for the network going forward.

The radio awards will allow fielding this capability set to multiple infantry brigades with 25th Infantry Division, 2nd Cavalry Regiment Stryker brigade combat team, while also supporting the Regionally Aligned Readiness and Modernization Model and Tactical Satellite Modernization efforts, the Army said. [More on this story](#) Source: Mark Pomerleau for C4ISRNET, photo credit Sgt. Justin Stafford, U.S. Army



Aerojet Rocketdyne Awarded NASA Contract For Orion Spacecraft Main Engine

NASA has selected Aerojet Rocketdyne to build the Orion Main Engine (OME), the primary propulsion element for NASA's Orion spacecraft that will be used to explore deep space. Under the contract, which runs through 2032, Aerojet Rocketdyne will deliver up to 20 new OME engines for use on future Artemis missions beginning with Artemis VII, or to support other NASA-sponsored, deep space exploration missions.

The OME is a 6,000 pound-thrust bipropellant engine that is mounted on Orion's European Service module and will be built at Aerojet Rocketdyne's Los Angeles, California, and Redmond, Washington, facilities. The engine is used for major maneuvers in space, such as entering and departing lunar orbit, and in some mission abort scenarios. The first six Orion missions will use refurbished Orbital Maneuvering System engines (OMS-E) that were provided by Aerojet Rocketdyne for the space shuttle program.

"Having originally designed and developed the OMS-E for the shuttle program, Aerojet Rocketdyne understands the engine's materials, manufacturing processes and thrust levels," said Aerojet Rocketdyne CEO and President Eileen P. Drake. "Now we are able to incorporate modern manufacturing techniques to provide NASA with a reliable, flight-proven and affordable engine to propel the Orion spacecraft and return astronauts to the Moon. We understand this engine inside and out and are excited to develop its next generation in support of future Artemis missions."

In addition to the main engine, Aerojet Rocketdyne also provides, under contract to Lockheed Martin, the auxiliary engines on Orion's service module, reaction control thrusters on the crew module, OMS-E refurbishment services and the jettison motor on the spacecraft's launch abort system. Orion's auxiliary engines and reaction control thrusters are produced at Aerojet Rocketdyne's facility in Redmond, Washington. The jettison motor is a combined effort of the company's facilities in Orange, Virginia, and Huntsville, Alabama. Source: Eileen Drake for Aerojet Rocketdyne, photo credit NASA

Triple Crown: Texas Again Takes Top Spot in U.S. Electricity, Wind, and Gas-Fired Power Rankings



Once again, Texas is clearly the national leader in energy production, with the EIA ranking it tops in the U.S. for both oil and gas and electricity production, according to new data released Thursday by the federal Energy Information Administration. The EIA's latest State Energy Report notes Texas' preeminent position in electricity, oil and gas and utility-scale wind energy production. In the latter, according to the EIA, Texas had installed 30.2 GW of wind power by December 2020, or nearly 30 percent of the U.S. wind turbine generation portfolio.

Texas also totaled more than 46,245,000 (46.2 million) MWh in net electricity generation for June 2021, the EIA state report shows. Florida was second at 22.6 million MWh, with Pennsylvania third at 21.4 million MWh. EIA data earlier this year predicted that gas-fired power's portion of the total electricity generation mix will drop over the next few years. In the Lone Star state, gas-fired power generates about 51 percent of the power in the state.

Texas is served by several grids, but the primary system operator is the Electric Reliability Council of Texas (ERCOT), which has limited connection to other grids. This was pinpointed as a challenge this winter when a freezing storm impacted power generation and 52 GW of electricity capacity tripped offline for a period. ERCOT and other state utility entities have vowed to not let that happen again.

Dallas, Texas, will be host to POWERGEN International and DISTRIBUTECH International when they co-located Jan. 26-28, 2022. Content at both events will focus on every facet of the electricity system, from conventional and renewable power generation to energy storage, transmission, distribution and interconnection and resiliency needs and challenges.

Former U.S. Energy Secretary and Texas Gov. Rick Perry will be the keynote speaker, while ERCOT interim CEO Brad Jones will join Perry in a Leadership Summit panel. Utilities from all over the nation and global are scheduled to speak in sessions for both POWERGEN and DISTRIBUTECH. *Source: Rod Walton for Power Engineering, photo credit Texas State House.*

International Militaries Reach For The Stars

During the Cold War, the space domain was dominated by U.S. and Soviet intelligence-gathering and ballistic missile warning capabilities that few other nations could match or fund. But today, militaries of many more countries are reaching for the stars. In 2019, NATO declared space as its fifth operational domain, and in the past year alone, France, Germany, Italy, Japan and the UK have set up military command structures focused on space operations. Australia will join this growing list with the formation of a space division in early 2022.



Most of these countries were already actively making use of the space domain for communications, research and observation, but the formation of these new command structures reflects the growing importance that space is playing in warfare, particularly in the era of "great power" competition.

Now more than ever, countries are dependent on space for essential military and economic functions. A 2017 UK government report into potential disruption of global navigation satellite systems (GNSS) suggested that the cost to the UK economy of a five-day disruption to GNSS signals could cost as much as £5.2 billion (\$7.2 billion) and that economic reliance is likely to increase as populations become more dependent on satellite-based communication services such as those provided by SpaceX's Starlink or OneWeb.

Perhaps the biggest reason for these new command structures, though, is Washington's decision to form the U.S. Space Force, putting "the military use of space on the political map and on mainstream media attention in a way that it hasn't before," Bledwyn Bowen, a lecturer in international relations and an expert in space warfare, space policy and international relations in outer space at the University of Leicester in England, tells Aviation Week.

Although many of the countries that have formed space commands have hailed the decision as game-changing, Bowen suggests the creation of these military formations is, at least for now, about "rearranging the deck chairs of various defense ministries . . . to give a bit more coherence on space activity." Instead, he suggests, their primary role will be to ensure that they can maintain points of contact with the U.S. Space Force. "If there's a more space-centric structure within the American Pentagon, then your military service, as a dependent ally of the United States needs to be able to communicate with the Space Force as well," Bowen says. [More on this story](#)

Source: Tony Osborne for Aviation Week, photo credit OHB-System AG