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UNITED PERFORMANCE METALS
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The UPM Market Informer

General Electric Surprise Winner at the Paris Air Show

General Electric (GE) emerged as the surprise winner at the Paris Air Show, elbowing out **Boeing** (BA) and **Airbus** (EADSY) in terms of value of new deals. GE stock, Boeing stock and Airbus stock all rose Thursday.

GE, including its CFM joint venture with France's Safran, bagged $55 billion in new deals at the marquee aviation event. Airbus wrapped up the show with deals worth about $44 billion, while Boeing hauled in about $34 billion, according to a Bloomberg tally of deals announced by the aerospace giants.

GE Aviation's $55 billion haul is a record breaker for the conglomerate. It swamps $31 billion in orders and commitments at the 2017 Paris Air Show and $22 billion at the 2018 Farnborough International Airshow.

The unit makes engines for Boeing and Airbus jets. Its headline deals this year included $20 billion-plus orders apiece from India's Indigo airlines and Malaysia's AirAsia, as well as an aircraft leasing deal with Amazon Air as **Amazon.com** (AMZN) builds out its delivery and transport network.
Source: Investor's Business Daily. Photo Marlene Awaad, Bloomberg

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As Coal Fades in U.S., Natural Gas Become the Climate Battleground

America's coal-burning power plants are shutting down at a rapid pace, forcing electric utilities to face the next big climate question: Embrace natural gas, or shift aggressively to renewable energy? Some large utilities, including Xcel Energy in the Upper Midwest, are now planning to sharply cut their coal and gas use in favor of clean and abundant wind and solar power, which have steadily fallen in cost. But in the Southeast and other regions, natural gas continues to dominate, because of its reliability and low prices driven by the fracking boom. Nationwide, energy companies plan to add at least 150 new gas plants and thousands of miles of pipelines in the years ahead.

A rush to build gas-fired plants, even though they emit only half as much carbon pollution as coal, has the potential to lock in decades of new fossil-fuel use right as scientists say emissions need to fall drastically by midcentury to avert the worst impacts of global warming.

"Gas infrastructure that's built today is going to be with us for 30 years," said Daniel Cohan, an associate professor of civil and environmental engineering at Rice University. "But if you look at scenarios that take climate change seriously, that say we need to get to net zero emissions by 2050," he said, "that's not going to be compatible with gas plants that don't capture their carbon." In some states, policymakers are now pushing to leave gas behind to meet ambitious climate goals. Last week, New York lawmakers passed a sweeping energy bill that calls for the state to switch to entirely carbon-free electricity sources by 2040, following states like California and New Mexico that have passed similar laws.

Since 2005, most power companies have lowered their carbon dioxide emissions significantly, in large part by shifting from coal to gas. Coal plants have become uncompetitive with other kinds of energy generation in much of the country, despite the Trump administration's efforts to save them by rolling back federal pollution regulations. But in a recent analysis, David Pomerantz, the executive director of the Energy and Policy Institute, a pro-renewables group, looked at the long-term plans of the 22 biggest investor-owned utilities. Some in the Midwest are planning to speed up the rate at which they cut emissions between now and 2030. But other large utilities, like Duke Energy and American Electric Power, expect to reduce their carbon emissions at a slower pace over the next decade than they had over the previous decade. "I really think gas is at the crux of it," Mr. Pomerantz said. "You've got some utilities looking at gas and saying, 'No thanks, we think there's a cleaner and cheaper path.' But then you've got others going all-in on gas."

Where Natural Gas Plants Are Expanding

Last fall, in North and South Carolina, a pair of utilities owned by Duke Energy filed plans with state regulators to continue retiring coal plants and largely replace them with more than 9,500 megawatts of new natural gas capacity by 2033. The utilities also plan to add a smaller amount of solar capacity, about 3,600 megawatts, over the same time frame. "Right now, gas is still the most cost-effective option for us," said Kenneth Jennings, Duke's director of renewable strategy and policy. One challenge with using more solar power, he noted, is finding a way to supply electricity when the sun isn't shining. Although Duke is installing some large lithium-ion batteries to store solar energy for less-sunny hours, the company says batteries still haven't reached the point where they're as cheap or effective as gas power, which can run at all hours. Mr. Jennings also said that it can be tough to add wind power in the Carolinas, where the terrain is less favorable than the wide-open Midwest and lawmakers have limited the construction of new turbines on mountain ridges and near military bases along the coast.

Opponents of Duke's plans, including environmental groups and local renewable energy producers, have urged state regulators to push the utility to reconsider. They have sharply disputed Duke's analysis, arguing that the utility is downplaying the potential for solar, wind and batteries. A similar fight is unfolding in Florida, where the local Sierra Club is challenging a proposal by Tampa Electric to replace two older coal units with a large new natural gas plant. The Sierra Club's pitch to the governor, who still has to approve the plan: Florida can't afford to deepen its reliance on gas at a time when climate change and sea level rise are threatening the state's coast. *Continued on page 3*

For Tampa Electric, the choice is complex. The utility plans to get 7 percent of its power from solar by 2021, but says that until storage technologies improve, gas will form the backbone of its energy mix as it tries to meet energy needs in a fast-growing part of the state.

These disputes are popping up in states around the country. Over the last decade, groups like the Sierra Club have tried to persuade utilities and regulators that they could save money by retiring coal and shifting to a cleaner mix of gas and renewables. Now they're running the same playbook against gas, arguing that the costs of wind, solar and batteries have declined so drastically that it's time to stop building new gas plants, too. So far, results have been mixed: Regulators in Arizona and Indiana have recently blocked plans for new gas plants, agreeing with opponents that utilities hadn't fully considered alternatives and that large new gas projects could be a risky bet at a time when clean energy technology is improving fast. But last year in Michigan, regulators approved DTE Energy's plan to build a new $1 billion gas plant, rejecting analyses by outside groups that the utility could save ratepayers money by scrapping the plant and making greater use of wind, solar and energy efficiency.

Where Renewables Are Gaining

At the same time, some utilities are discovering on their own that it can make financial sense to take a more ambitious leap toward renewable energy. Last year in Indiana, the Northern Indiana Public Service Company, or Nipsco, opened bidding to outside energy developers and found that adding a mix of wind, solar and batteries would be cheaper than building a new gas plant to replace its retiring coal units. (The company will keep its older gas plants online to fill in gaps when wind and solar aren't available.) Doing so, the utility estimated, would reduce its emissions 90 percent below 2005 levels by 2030. "We were surprised by that," said Joe Hamrock, the chief executive of the company that owns the Nipsco. "Renewables in our particular situation were far more competitive than we realized."

Mr. Hamrock noted that his utility had advantages that others might not have: Its territory sits near land that's ripe for wind development, making it easier to build new turbines close by without the need for lots of costly new transmission lines. "The answer we got might look very different for someone just 100 miles away," he said. Indeed, things look very different nearby in the vast regional grid known as PJM that serves 65 million people from Ohio to New Jersey. There power plants compete in a largely deregulated market and companies are expected to build over 10,000 megawatts of new gas plants by 2024 to take advantage of cheap natural gas from the nearby fracking boom in Ohio, Pennsylvania and West Virginia. "The shale gas revolution has, frankly, caused a delay in the growth of renewables here," said Stu Bresler, senior vice president for operations and markets at PJM Interconnection, which oversees the system. Wind and solar make up less than 6 percent of the region's generating capacity, well below the national average.

Now, some states are going further. Over the past year, California, Colorado, Maine, Nevada, New Mexico, New York and Washington have all passed laws aimed at getting 100 percent of their electricity from carbon-free sources by midcentury, which would eventually mean phasing out conventional gas plants. Yet even utilities that are already shifting more heavily into renewables say that it will be challenging to get rid of gas altogether. Last year, Xcel Energy, which serves eight states including Colorado and Minnesota, said it would shut down all its remaining coal plants in the years ahead and push to go completely carbon-free by 2050, saying that renewable energy, helped in part by federal subsidies, had fallen so much in price that this was now the cheapest option. While the utility thinks it can get 80 percent of the way to its emissions goals by 2030 with a mix of wind, solar, batteries and its existing nuclear plants, it will still rely on natural gas to provide the rest of its power and is building a new gas plant in Minnesota to balance out its supply.

Ben Fowke, the chief executive of Xcel, said that getting to 100 percent carbon-free power will likely require new technology that can supplant natural gas as a cost-effective backup fuel. Some possibilities include burning clean hydrogen instead of gas in power plants, developing techniques that enable carbon produced by gas plants to be captured and stored underground, advanced nuclear power or the invention of new energy storage techniques. Perfecting that technology would likely require big new investments in research and support from policymakers, he said. "But I'm convinced we can get there."

Source: The New York Times—photos by Rick Wilking of Reuters and Zack Wittman for the New York Times

H55 Zero-Emission Electric Airplane

Completes Its First Flight, A Stepping-Stone Towards Electric Propulsion for Flying Taxis.

H55, a Solar Impulse technological spin-off, has successfully flown a new electric airplane. Powered by H55's electric propulsion system and manufactured by BRM Aero, the Bristell Energic is a 2-seater fully electric airplane to be used for pilot training and flight schools. For H55 this is a stepping-stone for the development of electric propulsion systems designed for VTOLs and flying taxis.

H55 develops certified electric propulsion solutions to enable the next aviation revolution. The company focuses on the entire propulsion chain, to be certified CS 23, starting from the energy source and its management, through thrust and power, to pilot interface and control systems. Through its close and long standing collaboration with regulatory authorities, including the Swiss Federal Office of Civil Aviation, H55 leverages certification as an important source of innovation.

This electric flight trainer airplane, has received considerable interest from flight schools, airport resident associations and aviation authorities. The Bristell Energic offers a solution that is clean, quiet, cost efficient and safe. The airplane has an endurance of 1.5 hours, providing 45-60 minutes of mission flight with enough reserves, a typical training program for flight schools.
Source: Airframer

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Surcharge Totals April, 2019 - September 2019

	Apr	May	June	July	Aug	Sept
15-5	0.5269	0.5186	0.4846	0.4359	*	*
15-7	0.7894	0.7753	0.7310	0.6835	*	*
17-4	0.5205	0.5124	0.4804	0.4296	*	*
17-7	0.6235	0.6144	0.5658	0.5136	*	*
201	0.5117	0.5053	0.4716	0.4242	*	*
301 7.0%	0.6171	0.6081	0.5606	0.5079	*	*
302/304/304L	0.6721	0.6630	0.6110	0.5554	*	*
304-8.5%	0.6952	0.6859	0.6315	0.5755	*	*
305	0.8607	0.8506	0.7796	0.7195	*	*
309	0.8927	0.8829	0.8125	0.7462	*	*
310	1.2328	1.2214	1.1184	1.0416	*	*
316/316L	0.9686	0.9537	0.8932	0.8389	*	*
316LS/316LVM	1.2600	1.2400	1.1700	*	*	*
317L	1.1440	1.1268	1.0626	1.0032	*	*
321	0.7087	0.6992	0.6423	0.5878	*	*
347	1.0183	1.0089	0.9520	0.8976	*	*
409/409 Mod	0.2379	0.2301	0.2146	0.1798	*	*
410/410S	0.2450	0.2373	0.2218	0.1856	*	*
430	0.2861	0.2787	0.2641	0.2199	*	*
434	0.3696	0.3604	0.3463	0.3018	*	*
439	0.2948	0.2876	0.2732	0.2273	*	*
440A	0.2861	0.2787	0.2641	0.2199	*	*
2205	0.9209	0.9060	0.8699	0.8091	*	*
263	8.1914	6.6255	5.6357	5.1224	5.2572	5.2387
276	4.8268	4.8402	5.3238	5.5766	5.4513	5.2053
A286	1.1942	1.2554	1.4141	1.4935	1.4536	1.3368
330	1.4042	1.5145	1.7351	1.8334	1.7842	1.6226
400	2.5065	2.6933	3.1557	3.3232	3.2392	2.8939
455	0.7000	0.6900	0.6500	*	*	*
465	0.8700	0.8500	0.8100	*	*	*
600	2.6425	2.8836	3.3514	3.5278	3.4326	3.1096
601	2.3368	2.5331	2.9156	3.0716	2.9927	2.7267
617	6.3381	5.5608	5.2837	5.1310	5.1436	4.9959
625	5.0201	5.1199	5.5572	5.7679	5.6646	5.4098
718	4.8583	4.9881	5.3343	5.4896	5.4121	5.1871
X-750	3.2307	3.4651	3.9198	4.0928	4.0001	3.6859
825	2.0167	2.1033	2.3732	2.5047	2.4417	2.2649
HX	3.0669	3.0802	3.4023	3.5678	3.4849	3.2866
188	6.7400	7.2200	7.3400	*	*	*
CCM	7.1700	9.3200	9.7400	*	*	*
L-605	7.5400	8.2100	8.4700	*	*	*

*Surcharge currently not available