December 20, 2022

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Our newsletter reflects the focus of Akin's cross–practice autonomous systems and advanced mobility team on developments in the regulatory, policy, trade, intellectual property, and cybersecurity and privacy spaces. Autonomous Akin brings you the latest news and developments so that you can keep a pulse on what is happening in the government and industry that is impactful for your business. We hope you'll continue to read, and for our new readers, you can subscribe to future issues of this newsletter here. Thank you!

IN THIS ISSUE

UNMANNED AIRCRAFT SYSTEMS (UAS)

McMaster in Hamilton Using Drones to Deliver Medical Supplies to Oakville Hospital

It is called Care by Air: medical isotopes made at McMaster University that are used to treat prostate cancer patients are being delivered by drone from to an Oakville hospital.

In what is being called the first use of an autonomous drone delivery system for shipping medical goods directly to hospitals, the Hamilton university, Drone Delivery Canada (DDC), Air Canada Cargo and DSV Canada are partnering on a project that could make moving health care goods quicker, safer and more efficient. That includes iodine-125, a medical isotope that is made at the McMaster Nuclear Reactor and used to treat prostate cancer. Some 70,000 cancer patients are treated with Mac-manufactured medical isotopes each year.

The Care By Air pilot project will involve transport goods to Oakville Trafalgar Memorial Hospital for on-site patient diagnosis and treatment. Oakville Trafalgar hospital is operated by Halton Healthcare.

"McMaster is a recognized leader in the discovery and commercialization of medical isotope technologies — some of the most time-critical medical supplies in the world," states Andrea Armstrong, a research scientist at the reactor and adjunct professor of chemistry and chemical biology at McMaster.

A Care By Air test flight was held October 13 at DSV Global Transport and Logistics in Milton. The aforementioned DDC firm is contributing its Sparrow drone, its DroneSpot takeoff and landing zones and proprietary software to support the initiative.

“Our proprietary drone logistics platform is a perfect fit for delivering high-value and high-risk cargo, as is typical in the health-care market,” states Steve Magirias, who is the chief executive officer at DDC Canada.

Read Article

MissionGo Secures $50 Million Partnership with Southern California Edison

According to MissionGO’s announcement, its new three-year agreement with Edison International subsidiary Southern California Edison (SCE) is among the world’s largest contracts for use of what it calls “uncrewed aircraft systems (UAS).”

MissionGO, which specializes in developing vehicles for these systems like its MGV100 uncrewed vehicle, said that the contract will allow its products and systems to be used to inspect power line issues across SCE’s region. The Baltimore-based company shares the contract with another unnamed entity, per the announcement.

The contract will involve oversight of 160,000 utility poles that would otherwise require workers to climb and investigate. The agreement also builds on MissionGO’s extant work with the utility company, which it has worked with over the last three years.

“MissionGO is proud of our history with Southern California Edison and we look forward to continuing our work together,” MissionGO President Chris Corgnati said in the announcement. “SCE’s commitment to safety makes MissionGO the perfect partner to keep the people of California connected and secure.”

MissionGO Marketing Manager Megan Crout told Technical.ly via email that the money will support the hiring of various tech and tech-adjacent positions that are necessary to help its goal of identifying power outages—especially those related to the wildfires that repeatedly plague SCE’s coverage region.

“MissionGO’s team will collect images and data to assist with accurate and efficient reporting and triage of wildfire and power outage risks,” Crout said. “We are looking to hire a large number of teams for this contract with positions including RPICs, Field Operations Managers, GIS Specialists and more.”

This contract was announced about a month after the company, which was cofounded by current executive chairman Scott Plank, revealed that its Federal Aviation Administration (FAA) airworthiness criteria were published in the *Federal Register*.

Read Article

Pyka Receives Approval to Fly Agricultural Spray Missions at Night

Pyka, maker of the Pelican Spray, a fully autonomous and 100 percent electric agricultural aerial application aircraft, secured the first ever regulatory approval to fly unmanned aerial spray missions at night with a fixed wing aircraft.

Authorized by the General Directorate of Civil Aviation (DGAC) in Costa Rica on July 20, 2022, the Pelican Spray now has approval to be used by Pyka’s local customers to spray large commercial banana plantations, both day and night.

The DGAC issued their approval based on Pyka’s record of successful missions in Costa Rica to date, as well as a detailed analysis of the aircraft’s capacity for night operations given the specifications of its autonomous flight platform and lighting system. As a final step in the approval process, officials from Costa Rica’s flight regulator observed a live nighttime demonstration of the Pelican Spray operating over a banana plantation in the northeastern region of the country.

For banana producers, the practical benefits of spraying chemicals at night are well documented, allowing for better spray distribution and reduced risk of unintended chemical drift due to typically lower winds after sunset, while also increasing the viable spray window from roughly five hours per day to roughly 10 hours per day.

Pyka’s new technology eliminates the usage of fossil fuels, thus reducing operating costs for farmers and providing substantial environmental benefits, while enabling round the clock spray capabilities through automation.

Approval for night spray missions is just the latest addition to the list of precedent-setting regulatory achievements made by the young California-based aerospace company. Having secured nearly $48 million in funding to date, Pyka is scaling up manufacturing of its Pelican Spray while pursuing additional commercial certifications in the U.S. and Latin America. In parallel, the company is translating its successes in the agricultural space to air cargo with the highly anticipated launch of the Pelican Cargo planned for Fall 2022.

Read Article

Drone Strategy 2.0: The Future of Unmanned Aircraft in Europe

On November 29, the European Commission (EC) published its Drone Strategy 2.0 to lay the foundation for how unmanned aircraft will be used in the commercial and regulatory sectors. As part of a larger mission to be carbon neutral by 2050, this strategy will help regulate drone usage so it supports a more digitized and sustainable Europe.

The EC's Drone Leaders Group, which consists of General Aviation Manufacturers Association (GAMA) and other member companies, has looked at how drones should be regulated over the past few years. They published their final report in April, a report which became the basis for the recently released drone strategy.

Within this new drone strategy, the EC laid out how drones should be used in cargo and passenger operations. They also outlined performance-based and risk-based regulations as well as the skills development training needed to ensure drones are used properly. The framework is meant to ensure that drones are widely used—and regulated—by 2030.

The report draws from the current U-space regulatory framework and sets out the new Innovative Air Mobility (IAM) framework to regulate local and regional commercial air travel and the new Innovative Aerial Services (IAS) framework. IAS will regulate imaging, surveillance, mapping and inspecting in European Union (EU) states, while IAM will focus more on the use of drones in commercial operations.

Read Article

ADVANCED AIR MOBILITY

Archer Aviation Plans to Build 250 Air Taxis in 2025

Archer Aviation Inc. said it aims to make about 250 battery-electric air taxis in 2025 and scale up production in the following years, after setting a goal of getting its aircraft certified by the end of 2024.

"In our first year, we will build 250 aircraft, our second year will build 500 aircraft, our third year will build 650 aircraft and then we scale it up to around 2,000 aircraft per year," CEO Adam Goldstein told Reuters in an interview.

Archer aims to certify its pilot-plus-four-passenger aircraft, 'Midnight', by end-2024, though the FAA is still in the process of drawing up certification rules for these futuristic aircraft.

"We are not negative on the space, but think it will take a little longer to play out with the ramp not as steep as these companies had projected in their SPAC decks from over a year ago," he added. Archer shares have fallen 54 percent so far this year.

Once certified, the California-based start-up's electric Vertical Take-Off and Landing (eVTOL) aircraft will compete in a crowded market with dozens of other developers such as Joby Aviation Inc. and Vertical Aerospace Ltd vying to revamp urban transportation.

The nascent sector, which is backed by industrial heavyweights such as Toyota Motor Corp and Delta Air Lines, still faces significant challenges relating to certification, developing a suitable air traffic management system and battery technology improvements, among others.

In May, the FAA said it was modifying its regulatory approach in certifying eVTOLs by defining them as powered-lift aircraft rather than small airplanes, injecting concerns over certification delays.

Goldstein anticipates the industry may see demand for a thousand eVTOL aircraft on an annual basis.

Read Article

Integrating Advanced Air Mobility Operations into Tomorrow's Flight Department

Business aviation flight departments need to prepare for advanced air mobility (AAM) operations and related technologies that are emerging. There are many hurdles that the introduction of advanced technologies must overcome, including public acceptance, regulations and infrastructure requirements.

Sustainability is a primary focus for AAM manufacturers, stated Paul McDuffee, an executive operations analyst at Hyundai's Supernal who participated in the panel. Almost all of the major players in the industry are relying on electric propulsion as the primary motor force behind their aircraft. "There are variations out there—hydrogen fuel cells and some hybrid-electric vehicles—but for the most part, I think the sustainability aspects are very critical," he said.

There are many unknowns regarding sustainability in the AAM industry, McDuffee added. The industry needs to understand how aspects of sustainability will affect operation and performance of these vehicles. It's important to "still be a safe and integral partner with other legacy operators in the airspace," he said, and sustainability is "something that future flight departments are going to have to keep in mind."

"The flight department itself has to evolve to what new electric or hybrid aircraft demand for the infrastructure they use to deploy and dispatch the aircraft," noted Charlton Evans, CEO and Principal Consultant at End State Solutions.

"There will be some changes along the way in terms of how maintenance is conducted and how airport infrastructure has to evolve, both on the sending and receiving end," Evans said. "Those are the kinds of things that 135s have to consider with their hybrid-electric or fully electric vehicles."

AAM operations, at least in the near-term, will look a lot like those of traditional aircraft, believes McDuffee. "There's a lot of discussion now about what can reasonably be accomplished in the near-term as opposed to the long-term," he explained. "Right now, the lens is kind of narrowing down to the period roughly from now to 2030, and how we can operate in an effective way to satisfy our investors over the next seven years."

"There's a lot of new entrants that are evolving themselves and this technology," he said. "We don't know what the vehicle requirements are going to be. Partnering with the existing aviation support infrastructure now is super critical because flight departments of today are the ones that are going to be serving the AAM community of tomorrow."

Read Article

Volocopter Raises Additional USD 182 million in Second Signing of Series E Financing Round

Volocopter, the pioneer of urban air mobility (UAM), has raised an additional USD 182 million in the second signing of its Series E funding round. NEOM—the Red Sea's smart, cognitive region project—and GLy Capital Management of Hong Kong have joined Volocopter's diverse investor base. This will carry the company beyond the certification of its electric passenger aircraft, the VoloCity air taxi.

Sustainable mobility is a tremendous challenge facing today's world. Volocopter offers a suite of fully electric aircraft for urban missions. Crucially, Volocopter's holistic UAM ecosystem approach connects all key global market players as it strives to get the industry off the ground. This includes developing multipurpose electric aircraft to bring passengers and goods safely to their destination (the VoloCity, VoloRegion and VoloDrone), and enabling the physical and digital infrastructure to match (the VoloPort and VoloIQ).

"Attracting NEOM and GLy as investors is a great success and highlights our pole position in the commercial certification race. This is the key requirement to launching commercial

operations and starting to generate revenue," said Dirk Hoke, CEO of Volocopter.

Volocopter is a UAM leader, with over ten years of experience and upward of 1,500 successful test flights. As the first and only eVTOL company to receive Design Organisation Approval (DOA) from the European Union Aviation Safety Agency (EASA), Volocopter expects to launch its first commercial air taxi routes in the next two years in megacities like Singapore, Rome, Paris and the NEOM region.

Christian Bauer, CCO of Volocopter, added: "Raising over USD 180 million despite the generally tense economic climate highlights Volocopter's robust technology strategy and its ongoing progress toward achieving market readiness. We appreciate the remarkable spirit of collaboration and the trust that our existing and new shareholders have placed in us as we forge ahead on our journey to bring the urban air mobility ecosystem to life."

Volocopter and NEOM signed a joint venture (JV) company in December 2021, becoming strategic partners to integrate the VoloCity and the VoloDrone into NEOM's sustainable and smart mobility systems. The JV will design, integrate and operate all-electric public flight routes for the initial seven years.

"At Neom we strongly believe in the potential for urban air mobility to provide a new dimension to future integrated transport systems. Building on our successful collaboration with Volocopter, we are excited to strengthen our partnership and to make a strategic investment in the future of mobility. We believe Volocopter is the best partner to build an advanced air mobility ecosystem in Neom. We look forward to realizing this exciting mission jointly with Volocopter and its global partners" said Florian Lennert, Head of Mobility of NEOM.

Read Article

CAAS and EASA Sign Memorandum of Understanding on UAM

The Civil Aviation Authority of Singapore (CAAS) and the European Union Aviation Safety Agency (EASA) have signed a Memorandum of Understanding (MOU) to collaborate on UAM to support the development, deployment and safe operation of vertical take-off and landing (VTOL) aircraft. The agreement was signed on October 18, 2022, on the side-lines of the inaugural European Union–Asia Symposium on Unmanned Aircraft Systems (UAS) and UAM.

The inaugural European Union–Asia Symposium on UAS and UAM will be held in Singapore from October 18 to 21, 2022, and attended by over 140 participants. Jointly organized by CAAS and EASA, this is the first time regulators from Europe and Asia-Pacific are coming together to discuss UAS and UAM regulation, alongside leading industry players and researchers. Over 20 civil aviation authorities from the two regions will participate in the four-day symposium to engage industry players and researchers, discuss UAS and VTOL development and regulations and undertake a field visit to the Maritime Drone Estate, to learn how Singapore facilitates the development of novel technology in a regulatory test-bed environment.

Mr. Han Kok Juan, Director-General of CAAS, said: "In the last few years, we have seen quantum leaps in UAS and UAM development. The potential benefits are tremendous. Realising them will require concomitant development in regulation and regulators need to keep pace with technology and business developments to assure safety and security and build public confidence and acceptance. As the technology is novel, we cannot do this alone but need to work together to share knowledge and pool regulatory resources. The CAAS-EASA MOU is a pathfinder to catalyze such partnerships."

Read Article

TECHNOLOGY, ENVIRONMENT AND LEGISLATION

Flying Taxis, Robotic Avatars and Holograms - Saudi Arabia Pushes Ahead with Its Sci-Fi City Vision

If you've been seeing mysterious Bladerunner-type ads popping up on your phone recently for NEOM in Saudi Arabia and wondered what on earth you're looking at, it's not surprising

— this futuristic desert development is eye-popping in its ambition. With a mammoth budget of $500 billion, NEOM is a key element of Saudi's Vision 2030 plan originally launched back in 2016 as part of the kingdom's mission to diversify away from its oil-dependent economy. Excavation work started this month along the entire length of the project.

The development has received its fair share of skepticism around feasibility, with a raft of articles in publications ranging from *The Guardian* to the *Financial Times*, including commentary from architects who conclude the project is a pipe dream. Other critics note its carbon emissions among broader concerns.

Located on a coastal strip in Tabuk in the northwest of the country, there are three areas of NEOM that have been officially announced—primarily The Line, a linear city with Utopian vistas straight out of a Hollywood movie. Composed of two parallel skyscrapers that cut right through the desert for 170 kilometers from the coast to the mountains, The Line will be 200 meters wide and soar to a height of 500 meters (higher than most of the world's towers) — and for an added surreal touch, will be encased on all sides with gigantic mirrors.

The project is based on a new concept of "zero gravity urbanism," which is the idea of layering city functions vertically, while enabling inhabitants to move seamlessly in three directions (up, down, and across). When completed it could accommodate up to nine million residents.

While construction of this "Oz of the Middle East" is only at the beginning stages, there's already a push to lure top international talent across industries such as tourism, technology and entertainment to come and live and work. And there seems to be plenty of cash on the table to attract talent, with some reports suggesting NEOM is paying top executives as much as $1.1 million a year.

For those who do make the leap, they'll be signing up for a world of no roads, no cars—only flying taxis—plus a high-speed rail with an end-to-end transit time of just 20 minutes. Then there are the robotic avatars and holograms set to become part of everyday life.

The other planned NEOM areas are Oxagon, a "gateway to advanced and clean industries," which will become the largest floating industrial complex in the world—and Trojena, a year-round destination with mountain quality dry air, a ski slope, mountain biking, water sports, wellness facilities and an interactive nature reserve.

Read Article

A Bill Gates Fund Invested $50 Million in a Startup that's Building a Massive Refinery to Turn Alcohol into Jet Fuel

An organization founded by Bill Gates has granted a startup $50 million to build a massive refinery that produces sustainable aviation fuel from alcohol.

On Wednesday, LanzaJet announced it had received the funds from the Gates-led Breakthrough Energy fund, to continue work on its first commercial plant in Soperton, Georgia.

Sustainable aviation fuel is being explored by airlines as a way of making the industry more environmentally friendly. Currently, its adoption has been hampered due to the relatively low amounts produced.

The Soperton facility, known as the Freedom Pines Fuel Plant, is set to begin production in 2023. LanzaJet said the plant would produce nine million gallons of sustainable aviation fuel, and one million gallons of renewable diesel, per year when fully operational. LanzaJet produces the fuel using ethanol from products like sugarcane and waste corn. The company said it will lower emissions by at least 70 percent compared with conventional aviation fuel.

Gates founded Breakthrough Energy to boost innovation and investment in clean energy technology. The $50 million grant comes from Microsoft Corporation, BlackRock Foundation, Builders Vision and Gates, per Bloomberg.

Commercial aviation contributes just over 2 percent of all human-induced C02 emissions. SAF is an important, albeit still minor, part of how airlines plan to reduce their climate impact, to meet the International Air Transport Association's goal of being net zero by 2050.

In December, United Airlines flew a passenger flight using 100 percent SAF. The Boeing 737 Max 8 flew from Chicago O'Hare to Washington, D.C. with 500 gallons of SAF in one engine and 500 gallons of traditional jet fuel in the other. And in March, Airbus flew an A380 superjumbo using fuel made from cooking oil.

Read Article

FAA Releases AC to Help Pilots Avoid Midair Collisions

The FAA has released an advisory circular (AC) to guide pilots on the regulatory obligation to see and avoid other aircraft. AC 90-48E, "*Pilots' Role in Collision Avoidance*," alerts pilots of their potential contribution to midair collisions and near-midairs and recommends potential improvements in training, operating practices and scanning techniques to reduce conflicts.

While not mandatory, the guidance is designed to clarify the pilots' responsibilities under existing requirements, the agency said, adding it is considered one of the tools and advisory materials designed to reduce the risk of midair collision. Released on October 20, the AC replaces AC 90-48D, which was dated June 28, 2016.

Included in the AC are numerous regulatory citations, along with links to available reference materials. It reminds of regulations surrounding the basic see-and-avoid requirement "when weather conditions permit, pilots operating IFR or VFR are required to observe and maneuver to avoid other aircraft" and points to regulations surrounding right-of-way rules, operating on or in the vicinity of an airport, operations in classes of airspace, basic and special visual flight rules (VFR) minimums, equipment requirements and ADS-B, among others.

At the same time, though, the AC also warns of limitations of see-and-avoid, including human factors, environmental conditions and operational distractions. It discusses technologies, communications, in-flight procedures and maneuvering and training to protect against midairs**.**

Read Advisory Circular

Japan Successfully Propels Steam-Powered Spacecraft

Japan's space agency has successfully used water to propel a spacecraft and claimed it represents "the world's first successful orbit control beyond low-Earth orbit using a water propellant propulsion system."

The craft in question is EQUULEUS, the 6U CubeSat that rode along on NASA's Orion mission.

After flying past the Moon, EQUULEUS was pointed at the second Earth-Moon Lagrange point (EML2). To get there, it used an engine named AQUARIUS (AQUA ResIstojet propUlsion System) that uses water as fuel. The craft uses waste heat from communications kit to heat the water into steam that is squirted out to produce thrust.

As explained in this presentation [PDF], water is easier to store and handle than other fuels so is ideal for use in small, cheap satellites.

AQUARIUS also needs little power to operate but is not very powerful. EQUULEUS will take a year and a half to reach EML2—a point in space worth visiting because it's advantageous for transfer to other orbits. That includes interplanetary orbits.

The combination of EQUULEUS and AQUARIUS makes a visit to EML2 achievable at low cost and is a test case for future visits to the spot.

EQUULEUS carries an instrument called DELPHINUS (DEtection camera for Lunar impact PHenomena IN 6U Spacecraft) designed to observe Lunar impact flashes and near-Earth asteroids from EML2. Another instrument aboard EQUULEUS will observe Earth's plasmasphere.

Read Article

Tesla's 'Full Self Driving' Beta is Now Available to Everyone in North America

Car drivers came one step closer to obsolescence last night with the appearance of one single tweet from Elon Musk.

The Tesla CEO used his new business to tell the world that the EV company's "full self-driving" (FSD) beta software is now available to any owner of a compatible car in North America. The feature can be ordered from the car's infotainment screen, provided the owner has already paid for the tech.

Tesla's timelines tend to be so fluid they make 5W oil look like slabs of granite, but earlier this year the company said it would extend FSD availability to every driver before the end of 2022, and that's what it has delivered. Initially, only a small number of drivers were allowed to test the software, though access was extended to 160,000 drivers in the U.S. and Canada in September.

The company's driver-assistance technologies come in "Autopilot", "Advanced Autopilot" and "Full Self-Driving" forms, but despite owners paying as much as $15,000 for the top package, its supposed benefits, including assisted steering on city streets and the ability to recognize and react to traffic lights and stop signs, has been nothing more than an I.O.U note for most.

Opening up FSD to more drivers means Tesla will be able to collect more data from real-world driving situations that the company's Dojo supercomputer can chew over to further fitness the software.

Read Article

GMC's Denali Electric Truck Goes on Sale in Early 2024 with a $107,000 Price Tag

General Motors Co. (GMC) sees the future of the pickup, and it's an electric vehicle (EV) that sells for $100,000. The first version of the electric GMC Sierra pickup, called the Denali Edition 1, will go on sale in early 2024 for $107,000, the automaker said Thursday. It will join an electric Hummer that GMC dealers can sell for more than $100,000 and a $105,000 loaded version of Chevrolet's electric Silverado.

"About three years ago, there weren't that many trucks selling for over $100,000," Duncan Aldred, vice president of global Buick and GMC, said in an interview. "That has radically changed."

Ford's F-150 Lightning starts at $52,000 and the top-of-the-line Platinum edition starts at $97,000. The company raised prices in October due to strong demand and rising costs of materials.

For GMC, pricey trucks and SUVs under its top-shelf Denali sub-brand have been a big moneymaker. This year, 90,000 of the 374,000 GMC vehicles sold carried the Denali badge and fetched an average price of about $70,000, Aldred said. That nearly matches Cadillac's sales of 95,000-plus through the third quarter, making Denali a second luxury brand for GMC.

"We've always called this brand premium but, quite honestly, it's transacting as luxury," Aldred said.

The Sierra Denali Edition 1 will go 400 miles (640 km) on a charge and boast 754 horsepower, GMC said. The truck will have a 17-inch touch screen and fast-charging capability that can add 100 miles of range in 10 minutes.

Like the Hummer pickup, the Sierra Denali Edition 1 will have all-wheel steering and the ability to turn the wheels far enough to maneuver sideways. GMC calls the feature Crab Walk.

For the 2025 model year, GMC will offer two less-expensive trim levels, with the Elevation lowest at about $50,000. When the first version goes on sale, GMC will have three EVs, including both pickup and SUV versions of Hummer.

The automaker's least-expensive electric truck will be a work version of its Chevy Silverado, which the company said will start at just under $40,000, targeting commercial fleet buyers, beginning in the spring of 2023.

Separately, GM has been toying with the idea of a midsize electric Hummer pickup truck to add to the GMC showroom. Aldred said Hummer has successfully come back to life after laying dormant for a decade and he would consider expanding the lineup.

He expects total sales of 50,000 vehicles a year for the two larger Hummers.

Read Article

Ford Abandons the Self-Driving Road to Nowhere

Self-driving car developer Argo AI suddenly announced that it was closing its doors this week. Some of its 1,800-odd employees, already reduced by summer layoffs, are to be offered jobs to "work on automated technology with either Ford or Volkswagen," Catherine Johnsmeyer, an Argo spokesperson, said in a statement. The two auto giants had sunk some $3.6 billion into Argo and owned most of it. Now, they had decided to pull the plug.

The end of Argo is just the latest sign that the global effort to get cars to drive themselves is in trouble—or at least more complex than once thought. As some investors bear down for a potential recession and others prepare for a revolution in the form of electric cars, the prevailing wisdom on autonomous vehicles has fractured in two. Ford and Volkswagen, are changing lanes. They've given up spending heavily in hopes of a monster payout some distant self-driving tomorrow and prefer to back technologies they can sell to car buyers today.

Far from a lightweight in autonomous vehicles, Argo was a major and well-respected player. The company was founded in 2017 with a nearly $1 billion investment from Ford, which was then eager to catch up with the autonomous Joneses—Google, Uber, GMC and VW. Argo had pedigree, thanks to president Peter Rander, an alumnus of Uber's abandoned self-driving project and among those the ride-hailing company had poached from the National Robotics Engineering Center, and CEO Bryan Salesky, a veteran of the DARPA challenges that kicked off the 21st century's rush to autonomy.

Argo had wheels on the road and was testing in at least eight cities in the U.S. and Germany, including its home base of Pittsburgh. And it had acquired a reputation in the industry for its safer approach to the dangerous project of testing robots on public roads. In addition to the backing of big names like Ford and Volkswagen, it received funding from partner Lyft, Uber's ride-hailing rival.

Farley, Ford's CEO, said the company learned through Argo "that we will have a very long road" to get to a truly self-driving car. Overall, some $100 billion has been poured into the AV industry, he estimated, "and yet no one has defined a profitable business model at scale."

For the accountants at auto giant Ford, the math of Argo, which took in more than $3 billion during its brief life, just didn't add up. They calculated it would be five years or more "before you could actually get to something that started to generate a meaningful business," said John Lawler, Ford's chief financial officer. The company disclosed a $2.7 billion accounting charge this quarter to wind down Argo, resulting in an $827 million loss.

Read Article

How United Airlines Expects Electric Planes to Change the Way Passengers Make Travel Decisions

The nation's No. 3 carrier has a contract to buy electric 30-seat planes from startup Heart Aerospace, which Heart said it plans to introduce in 2028. In a twist, United's plan is not to replace big jets, but to focus the new planes on regional service. The airline is also preparing to introduce eVTOL craft to do local transport like taking passengers from central cities to airports.

The idea is less to shift how fliers behave than to convince small-city residents who now drive on trips of 250 miles or less to take a plane instead, Mike Leskinen, United's vice president of corporate development and president of its United Ventures investing arm, said

at the CNBC ESG Impact earlier this month. If it works, it opens up a new market for carriers like United, especially outside major metropolitan areas.

“There’s absolutely a lot of hurdles to clear but aerospace development cycles are measured in decades and you have to get started now,” Leskinen said. “We cannot continue doing and operating our business the way we do. It is imperative that we change it and the way we’re going to change it is through investing in technology.”

“It used to be different,” said Anders Forslund, CEO of Gothenburg, Sweden-based Heart Aerospace, which has a contract to supply United with 100 30-seat electric planes. “Go back to the 1990s, there were hundreds of small aircraft serving a lot of communities that have now lost service.”

“What that means is that a small city is going to either get service they didn’t have, that they had to drive to a [bigger] airport, or they’re going to have greater frequency of service,” Leskinen said at the CNBC event. “That’s going to allow that customer from that small town to make a trip in and out on the same day, whereas before you couldn’t do that with traditional jet powered aircraft.”

And the United Airlines executive predicts that these electric plans will be cheaper for the airline than traditional jet engines within a decade. “As we adopt electric aircraft, I think the cost for a 30-seat aircraft, 50-seat aircraft as the industry evolves is going to be lower cost than a traditional aircraft.”

Read Article

Why Do ESG Ratings Vary So Widely—and How Can Investors Make Sense of Them?

As investing based on environmental, social and governance (ESG) factors continues to grow, investors are faced with a dilemma: Which ESG ratings are they to believe? After all, investors themselves have no idea which companies live up to ESG standards. They need to rely on outside ratings to determine which companies are worth their investment dollars.

Yet ESG ratings vary substantially depending on which provider is doing the ratings—to a point where a company could be highly rated with one rating company and have a very low score with another. The correlation between ESG ratings from the six raters my colleagues and I looked at ranged from 0.38 to 0.71, on a scale from minus 1 (meaning total disagreement) to 1 (meaning full agreement). In other words, the six never all agreed on a company’s ESG rating, and in most cases there was little agreement among them.

That means investors need to dive deep into the details of the different methodologies of ESG raters when the same company has dramatically different ratings.

To get at the reasons for the divergence in ESG ratings, Julian Kölbel, Roberto Rigobon and I analyzed the differences between ESG ratings from six raters. We identified three sources of the divergence: differences in which indicators are included in the ratings, in the weights given to each of those indicators, and in how they are measured. Together, those three factors define each rating company’s methodology.

Here is what we found—and potential ways to address the divergence of ESG ratings to make them a better tool for investors. To see how much the underlying data can differ from rater to rater, consider this: In our sample of six different raters, the number of indicators that feed into the final ESG rating ranges from 38 for one rating company to 282 for another. This indicates substantial differences in what ESG raters think is important.

Weight divergence happens when rating companies have different views of the relative importance of various issues. For instance, occupational health and safety are commonly measured by looking at injury rates in factories. Some raters might give more weight to how companies perform on this score than, for example, the companies’ lobbying practices. But other raters think that lobbying practices are much more important, as companies might try to reduce accidents in their own factories but at the same time lobby against regulation aimed at making all factories safer—which could add up to more injuries nationwide.

Investors need to know if the weightings align with their own personal concerns. For instance, for many people—and for many raters—diversity and climate change have taken

on more importance in recent years. But there remain major differences in the weights raters give them.

Read Article

LIDAR Sensor Price Plunge Leads to Orders from GMC, Volkswagen

When it comes to perception technology, LIDAR simply can do what other sensors cannot. Developers of automated driving systems of all grades will still need to effectively utilize their camera-based system capabilities, but by operating in concert with LIDAR, automated driving can function better and make roads safer.

LIDAR technology is changing in that there's an increasing focus on sensors with few or no moving parts, referred to in the industry as hybrid solid state and solid state. These sensors can do less than the mechanical spinning variety of LIDAR, but they come at a fraction of the cost. Using a combination of between four and eight solid-state LIDAR sensors can deliver comparable performance to mechanical spinning LIDAR at a lower price point. There's also the added bonus that components without moving parts are more suitable in the automotive environment.

LIDAR has historically been used mostly on highly autonomous vehicles, of which we estimate there are currently around 3,500 in testing or deployment around the world. However, automakers are putting LIDAR on more production vehicles to improve their advanced driver assistance systems, or ADAS.

There's growing view in the auto industry that SAE Level 3 automated-driving systems—where the driver can hand over authority to the vehicle under specific conditions—will have LIDAR. A prime example is the strategy of GMC.

GMC has offered its positively reviewed Level 2 system, called SuperCruise, since late 2017. For its Level 3 system Ultra Cruise, GM is employing LIDAR from Cepton, a San Jose, California-based supplier that went public by merging with a special purpose acquisition company earlier this year.

A host of other automakers are also looking to LIDAR as a way to improve their ADAS, including Volkswagen, whose software unit Cariad recently ordered $4 billion worth of sensors from Innoviz Technologies. Chinese automakers, in particular, have adopted the sensors even in vehicle with far lower sticker prices than some of the vehicles available to consumers in the U.S. and Europe.

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The Weirdest Thing About Being in a Self-Driving Car? How Unremarkable It Feels

One day this month, I finished up some shopping in Chandler, Arizona, a few towns over from a hotel where I was attending a conference. I had a few free hours and I wanted to grab some tacos at a nearby place that had been recommended to me. So I pulled out my phone, opened an app and hailed a ride. This seems rather a dull story, I hear you say, and, you're right, except for one thing: The car had no driver.

Since October 2020, the Google spinoff Waymo has operated a driverless commercial taxi service south of Phoenix. Having written about the possibilities of a self-driving future, I wanted to try it out, so I headed over to Chandler and downloaded the Waymo One app. This was no curated demo for journalists, hovered over by anxious engineers and peppy PR folks; I got exactly the same service that you will, if you ever find yourself in Chandler and want to go for a ride in the future.

I warn you that if you do, you will find the future feels almost disappointingly normal. Not at first, though. At first you experience awe tinged with a bit of fear. There is an undeniable horror-movie aspect to sitting in the back of a car and watching the steering wheel turn of its own accord, and for just a moment I thought, "God, what have I done?" But the car's ultracautious driving style quickly overcame my reservations, for no Uber driver ever piloted a vehicle so conservatively.

Now, of course, most of the time I was aware of my strange situation. I peered over the empty front seat to try to determine whether the gas pedal was moving by itself, like the

steering wheel. (Not as far as I could tell.) I laughed as drivers in adjacent lanes did a double take over the missing driver. I goggled at the display that showed me what the car "sees"—the lanes on the road, the other cars, even pedestrians. But when all that was said and done, it was just a ride, and when people asked me what it was like, all I could say, apologetically, was that it was both supercool and oddly unthrilling.

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