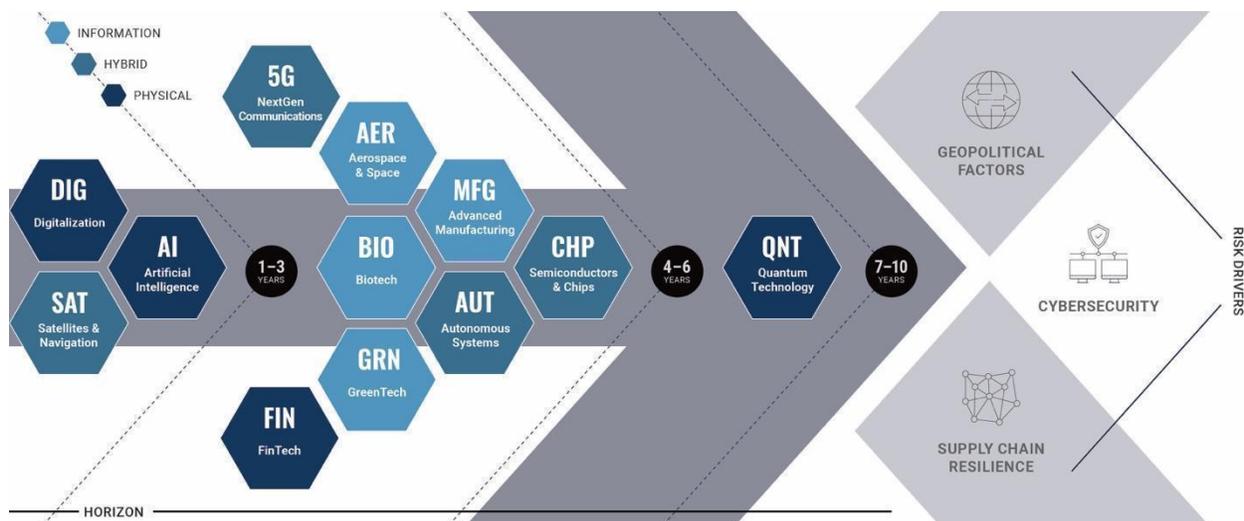




MATRIX MONITOR

Friday December 10, 2021

Welcome to Next5's weekly digest – emerging technology news and analysis to keep you on your game and ready for what's Next



This week's Next5 Matrix Monitor features the USSF's launch of two satellites for testing of advanced technology, machine learning's role in mathematics, 5G wireless spectrum's impact on aviation, recent consumer data on FinTech solutions, the Missile Defense Agency's new radar system for ballistic missile defense, a 3D printed vaccine patch, a common language that could help driverless cars communicate with humans, and U.S. plans to limit the exports of surveillance tools that suppress human rights.

NEXT5 NEWS & AMPLIFICATIONS:

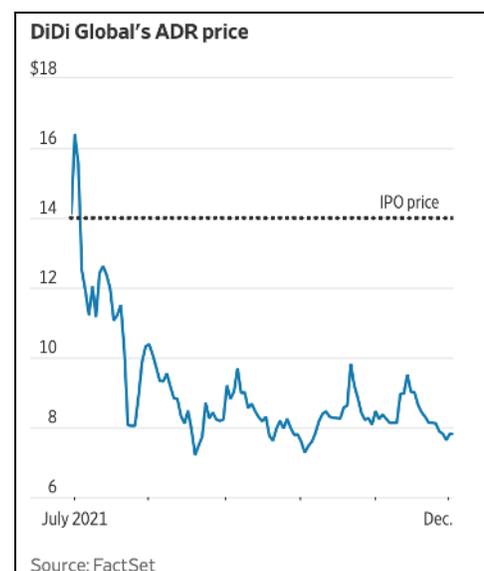
→ **Next5 published an article this week highlighting the great opportunity and risk presented by quantum technology as it emerges, along with steps leaders should take today to prepare.** Bottom line: Failing to lead in quantum could put us behind in other emerging technology areas, depriving us of great economic and technological leadership. And China stands a chance at winning the quantum race. But there are steps leaders can take now to prepare for the quantum era. #QNT #Geopolitics #USA #CHN [Next5](#)

→ **Critics are speaking out against Microsoft for allegedly adopting a “fox watching the hen house” approach to the cybersecurity business.** In an interview with Bloomberg, CrowdStrike CEO Gorge Kurtz said Microsoft is unable to keep up with cybersecurity trends and leaves its customers vulnerable to attacks, while an op/ed from leadership at Proofpoint said, “Microsoft technology is a significant contributing factor to increasingly devastating cyber attacks.” In a recent congressional hearing, Kurtz said the company’s failure to shore up known vulnerabilities exacerbated the infamous Solarwinds hack. The op/ed went on to say “Rather than investing millions into preventing vulnerabilities and exploitable configurations, Microsoft is instead profiting from their existence.” #Cybersecurity #USA [Bloomberg Fortune](#)

→ **Secretary of Homeland Security Alejandro Mayorkas, National Cyber Director Chris Inglis, CISA Director Jen Easterly, and DHS U/S for Policy Rob Silvers met with industry leaders in Silicon Valley this week to discuss improving public-private partnership.** Industry attendees included senior leaders from AT&T, Broadcom, Cisco, Cloudflare, Google, Juniper Networks, Lumen, Mandiant, Microsoft, Palo Alto Networks, Recorded Future, SecureWorks, Tenable, and VMWare. #Cybersecurity [DHS](#)

DIGITALIZATION

→ **Didi plans to delist its shares in the U.S. and pursue a listing in Hong Kong.** The move was supported by the company’s board and comes as authorities in Beijing wrap up a cybersecurity probe into the company. Didi listed on the New York Stock Exchange on June 30 after raising about \$4.4B from an IPO. But shortly after the IPO, Chinese authorities, taken by surprise by Didi’s move to go public, launched a data-security review. Chinese regulators also blocked Didi’s China business from adding new users and ordered it to take down some apps. Beijing has been trying to formalize regulations that will make it much harder for Chinese companies, especially those holding



large amounts of data, to list in the U.S. and other foreign markets. Meanwhile, the U.S. has tightened standards for Chinese companies to sell shares in U.S. markets, demanding more disclosures on regulatory risks arising from China. #DIG #CHN #HKG #USA #Geopolitics [WSJ](#)

→ **Business leaders, politicians, and startups are helping customers control and benefit from the personal data the technology industry collects on them.** [Project Liberty](#) is an initiative to rebuild the web as an infrastructure owned by the public. It includes \$25M to develop a decentralized social networking protocol, which is set to create a model for personal data governance online. Blockchain software would store information about users' social connections. And after getting permission from users, social media companies would draw from this same pool of data about users' connections and interactions. This would allow users to move their data between networks and prevent a single company from becoming too powerful. Users would also get paid in a cryptocurrency for the use of their data. 60% of respondents to a Project Liberty poll of 1,022 U.S. adults in September said they would keep their data private if they owned and controlled it, while another 23% would exchange it for something of value.

Startups putting this concept into practice:

- [Brave Software](#) pays its 42M users 70% of the revenue it generates from ads they see.
- [Foursquare Labs](#) rewards consumers with gift cards for sharing their location.
- [Tapestri](#) pays consumers for sharing their anonymized location history, which the startup then sells to brands.
- [Reclaim](#) gives users a view into the information that the industry buys and sells on them.

#DIG #FIN #USA #USA [WSJ](#)

→ [Clearview AI](#) is set to receive a U.S. patent for its facial recognition technology. The company was reportedly sent a "notice of allowance" by the U.S. Patent and Trademark Office. Clearview AI builds its facial recognition database by using images of people from social media. Critics argue that the company's technology is a violation of privacy and that it may negatively impact minority communities. The technology is allegedly less accurate when identifying people of color and women, potentially leading to false arrests when used by law enforcement agencies. According to the company, last year, the technology was used by over 2,400 police agencies to identify suspects. In the aftermath of the Capitol riots this January, use of the technology sharply increased as detectives worked to identify those associated with the incident. #DIG #AI #USA [The Verge](#) [Politico](#)

SATELLITES & NAVIGATION

→ **Two US Space Force satellites were launched into orbit Tuesday, December 7, for tests of advanced technology.** The first satellite carries nine experiments, including NASA's Laser Communication Relay Demonstration (LCRD) and nuclear detonation sensors provided by the

National Nuclear Security Administration. The second satellite carries several experimental payloads and will operate on its own for one to three years. NASA's LCRD experiment will use two sites in Hawaii and California to test the system's ability to beam back data under different atmospheric conditions. NASA plans to launch a terminal to the International Space Station later that will send data to the ground via the LCRD payload and vice versa. Eventually, laser systems could be used on deep space missions to speed up data transmission. #SAT #USA [CBS](#)



ARTIFICIAL INTELLIGENCE

→ **The DoD is hiring its first ever chief digital and artificial intelligence officer and formally establishing a new office under their purview by next summer.** The new CDAO will report directly to the Deputy Defense Secretary. Once the office is formed, the senior official will supervise and support the meshing of all data-centered and AI-aligned work led by the DoD's JAIC, office of the chief data officer, and Defense Digital Service. Market research and industry practices to meet the pacing threat of China influenced the department's move to implement the new position. DoD hopes to begin an initial operating capability by February 1 then reach full operational capability by June 1. #AI #USA #CHN #Geopolitics [Nextgov](#)

→ **Mathematicians and AI experts have teamed up to demonstrate how machine learning (ML) can open new avenues of exploration in the field of mathematics.** In a newly published [study](#), a research team used AI systems developed by [DeepMind](#), the same company that has been deploying AI to solve biology problems and improve the accuracy of weather forecasts, to solve some long-standing math problems. The team shows AI advancing a proof for Kazhdan-Lusztig polynomials, a math problem involving the symmetry of higher-dimensional algebra that has remained unsolved for 40 years. The research also demonstrated how a machine learning technique called a supervised learning model could spot a previously undiscovered relationship between two different types of mathematical knots, leading to an entirely new theorem. Knot theory in math is the study of closed curves in three dimensions and

their possible deformations without one part cutting through another. It plays into various other challenging fields of science as well, including genetics, fluid dynamics, and even the behavior of the Sun's corona. The discoveries that AI makes can therefore lead to advances in other areas of research. #AI #USA [Science Alert](#)

→ **The Harvard Business Review shows three ways that AI technology has become a necessity for businesses:**

1. Predictions - AI can now recognize connections between embedded characteristics, allowing companies to prepare more effectively for disruptive events. Early AI warning systems for fraud can now detect bots, making them increasingly essential to get ahead of the evolving tactics of hackers, nation-state actors, malware, and ransomware.

2. Efficiencies - In industries like insurance, human resources, and surveillance, ML reads through forms and reviews voice and video recordings to highlight where the reviewer's attention should be focused, or how a call should be routed. The development of "attention" approaches has accelerated the use of natural language processing, allowing AI to more reliably link seemingly unrelated concepts and work faster.

3. Real-Time Optimization - Machine learning algorithms now automatically increase sales promotions or delay launching products that might reduce profit from other product lines. In retail, AI can recalibrate these types of decisions to generate additional sales. #AI [HBR](#)

NEXT GENERATION COMMUNICATIONS

→ **Military officials deployed the first functional 5G network at a U.S. military installation on Thursday, December 2, at Hill Air Force Base.** The Department of Defense initiated the Dynamic Spectrum Utilization program in 2019, with a goal of seeking out innovative prototypes that can demonstrate commercial 5G technologies to augment future military capabilities. The program provides industry partners with technology vital to ensuring commercial 5G systems and military airborne radar systems can optimally coexist within the same spectrum band without interference. The work at Hill is part of a \$600M plan to perform testing and evaluation of 5G technologies at military installations across the U.S. Upon announcing the 5G initiatives last year, the Defense Department estimated a three-year window for Hill's involvement. One year will go into preparation with the remaining two years for testing. #5G #USA [Standard Examiner](#)

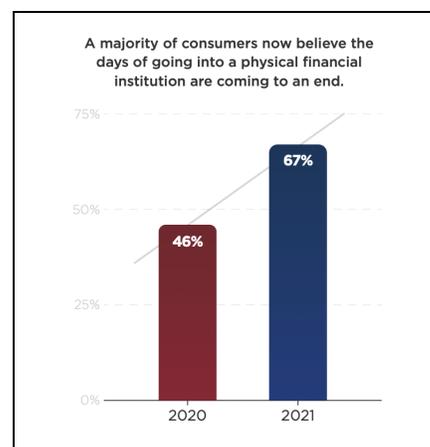
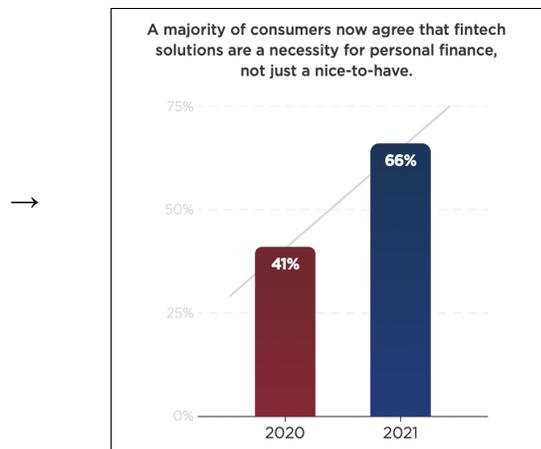
→ **5G networks will account for ~77% of global mobile operator revenues by 2026, with demand for consumer and business services driving adoption.** A report from Juniper Research predicts 5G revenues will reach \$600M within the next five years—a benefit for operators rolling out 5G infrastructure and new services in a bid to increase income. According to researchers, this growth is being driven by reasonably-priced tariffs and the availability of

devices despite the ongoing chip shortage caused by the pandemic. It is also predicted that by 2026, the number of cellular IoT devices will reach 6B– overtaking smartphones for the first time. A separate [study](#) by Ericsson suggests there would be 600M 5G subscriptions by the end of this year. #5G #SWE [Tech Radar](#)

→ **The U.S. Federal Aviation Administration (FAA) on Tuesday, December 7, warned that interference from 5G wireless spectrum posed an air safety risk.** The aviation industry and the FAA have raised concerns about the potential interference of 5G with sensitive aircraft electronics like radio altimeters. And as we previously reported, AT&T and Verizon in November agreed to delay the commercial launch of C-band wireless service to early January after the FAA raised concerns. On Tuesday, the FAA issued a pair of directives ordering the revision of airplane and helicopter flight manuals to prohibit some operations requiring radio altimeter data when in the presence of 5G C-Band wireless broadband signals. The FAA remains in discussions with the Federal Communications Commission (FCC), White House, and industry officials about precise limitations, which are expected to be outlined in the coming weeks. #5G #USA [Reuters](#) [The Verge](#)

FINANCIAL TECHNOLOGY

→ **A recent [study](#) by [Blumberg Capital](#), which polled 1,000+ U.S. consumers over the age of 21, revealed a significant shift in how consumers value FinTech solutions.** Following pandemic lockdowns, the majority of consumers (66%) now believe that FinTech solutions are a necessity for personal finance, not just a luxury, up from 41% in Blumberg Capital's 2020 FinTech survey results. In the first half of 2021, U.S. FinTech startups raised a record-breaking \$39B in venture capital, nearly double than the same period in 2020. #FIN #USA [PR Newswire](#)



[WeLab](#), a Hong Kong-based FinTech company, announced its acquisition of Bank Jasa Jakarta (BJJ), an Indonesian commercial bank. With the deal, WeLab is planning to launch a digital bank to capture the country's unbanked population in the second half of next year. A consortium led by WeLab has raised \$240M from existing and new investors, which the company claimed was the largest fintech funding in Indonesia this year. WeLab currently

operates a suite of consumer fintech products across Asia, including the virtual bank and a lending product in its home city, as well as several types of lending services in mainland China and Indonesia. According to WeLab, the company has amassed over 150K digital banking customers. Its online lending app for Southeast Asia, Maucash, launched through a joint venture with Astra International, has more than 3M Indonesian users. Tech companies see growth opportunities in Indonesia because of the country's relatively young population. Some of the more notable players include [Xendit](#), a company that provides digital payments infrastructure, and [Payfazz](#), which offers a mobile app for handling routine financial tasks. #FIN #HKG #IDN [Tech Crunch](#)

AEROSPACE & SPACE

→ **NASA announced three funded Space Act Agreements as part of its Commercial Low Earth Orbit Destinations (CLD) program.** The initiative supports work on commercial stations that the agency hopes to have in place by late this decade, allowing it to transition from the ISS while maintaining a presence in LEO for scientific research and preparation for missions beyond Earth. The largest award, at \$160M, went to a team led by [Nanoracks](#) and includes [Voyager Space](#) and [Lockheed Martin](#). Those companies announced a space station concept called Starlab on October 21 that could be ready by 2027. A second award, valued at \$130M, went to a team led by Blue Origin for the Orbital Reef space station announced October 25. The project includes [Boeing](#), [Redwire](#), and [Sierra Space](#), among others, with a goal of entering initial operations in the latter half of the 2020s. The third award, worth \$125.6M, went to a concept from [Northrop Grumman](#). Their proposed station would leverage the company's work on the Cygnus cargo spacecraft, Mission Extension Vehicle satellite servicing program, and the Habitation and Logistics Outpost module it is building for NASA's lunar Gateway. #AER #USA [Space News](#)

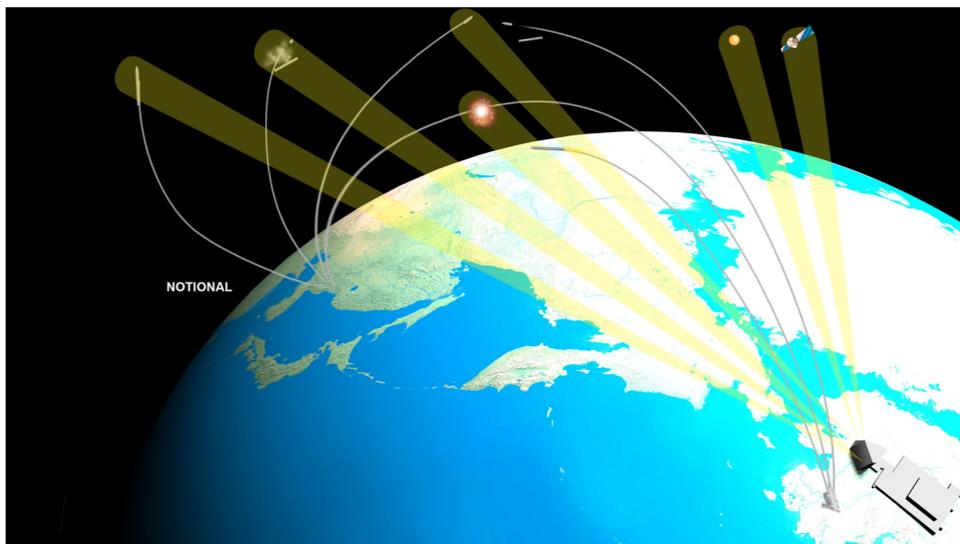
→ **Galactic Energy launched its second Ceres-1 rocket on December 6, becoming the first Chinese private firm to reach orbit twice.** The four-stage Ceres-1 solid rocket successfully placed five satellites into a roughly 500-kilometer Sun-synchronous orbit (SSO). The launch follows the company's first in November 2020, which made Galactic Energy only the second Chinese private rocket firm to reach orbit, following the success of iSpace in July 2019. Galactic now plans five launches in 2022. The company stated it had made several improvements to Ceres-1 since the first launch, improving the second and third stage engines and introducing carbon fiber composites, boosting thrust-to-weight ratio, payload capacity, and overall performance of the launcher. The launch was China's 48th of the year and extends the country's new national launch record for a calendar year. The vast majority have been Long March rocket launches performed by the China Aerospace Science and



Technology Corp., (CASC), with the exception of the Ceres-1 launch, three Kuaizhou-1A launches, and two launch attempts from iSpace.

#AER #SAT #CHN [Space News](#)

→ **The Missile Defense Agency announced it has started initial fielding on a key radar program that will play an integral role in protecting the U.S. from ballistic missiles.** The Long-Range Discrimination Radar, built by [Lockheed Martin](#) and pegged at \$1.5B for development and deployment, is stationed at Clear Space Force Station in Alaska—the system will be turned over to the Space Force after it completes testing. The S-band radar’s primary purpose is to distinguish between intercontinental ballistic missiles launched by adversarial states towards the U.S. and decoys or other objects moving through space. In addition to protecting from an attack, the capability to differentiate between real threats and decoys helps preserve the Pentagon’s supply of interceptors. Last week, Lockheed Martin conducted a successful test using one of LRDR’s secondary arrays to track several different satellites over a 40-minute period.



The Long-Range Discrimination Radar will be better able to tell apart different types of targets, as illustrated here. (Graphic courtesy of Lockheed Martin)

#AER #USA [Breaking Defense](#)

BIOTECHNOLOGY

→ **Elon Musk’s brain-interface tech company Neuralink is looking to start human trials of its brain chip in 2022 after seeing successful trials in monkeys.** Musk says he hopes to have chips placed in humans with severe spinal cord injuries like tetraplegics and quadriplegics. He hopes this technology will allow someone who cannot walk or use their arms to do so again.

The technology could also be used to help cure addiction and depression. As we previously reported, Neuralink showed off its brain chip in a monkey which allowed the animal to play a game of pong using only its mind (telepathically) in exchange for a banana smoothie. Neuralink's system is comprised of a computer chip attached to tiny flexible threads that are stitched to the brain by a sewing-machine-like robot. The device picks up signals in the brain, which are then translated into motor controls. Musk says that the technology has proven to be safe in the brain and can be easily removed, so the only thing holding Neuralink back from human trials is FDA approval. Musk previously said the Neuralink's chips would be used in human trials by the end of 2020. #BIO #USA [Daily Mail UK](#)



→ French healthcare company [Sanofi](#) said it would buy Austrian group [Origimm Biotechnology](#), a move that will add a first-in-class acne vaccine candidate to its pipeline. Sanofi said it confirmed its mid-term sales guidance of a mid-to-high single-digit growth for its vaccine business. The planned acquisition of Origimm, and its acne vaccine candidate, will broaden its vaccine R&D and fulfill medical needs for teenagers and adults. Earlier this year, Sanofi bought [Kadmon](#) and [Translate Bio](#), both U.S. biotechs. The latter purchase allowed Sanofi to acquire significant knowledge in mRNA technology, which the group is expected to use in a majority of its vaccine candidates moving forward. # BIO #FRA #AUT [Reuters](#)

→ **In a year when biotech delivered vaccines and treated COVID-19, the sector is still performing poorly in public markets.** Over the past year, the S&P 500 index has climbed 22.7% but the S&P 500 Health Care sector index has only gained 15.9%. The reason for this performance can be attributed to the explosion in the private biotech market. More funds are now allocating money in private markets, which has led them to become less interested in public equities. This means that early-stage startups are getting most of the capital, and once they go public, their technology will be surpassed by another startup, leading to a cycle of private money. This year, more than 500 private biotech companies have received some sort of funding, and many of them have gone public with over-inflated valuations. Public investors have lost

interest in the sector and private investors are dropping the companies as soon as they go public, looking for the next startup to invest in. #BIO [Barron's](#)

GREEN TECHNOLOGY

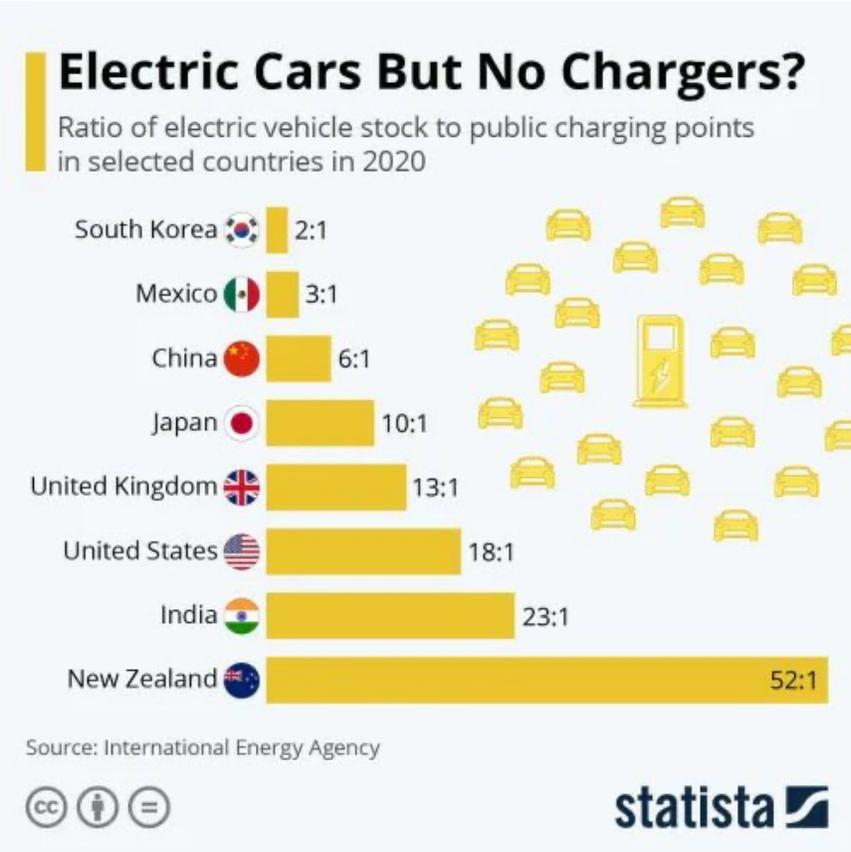
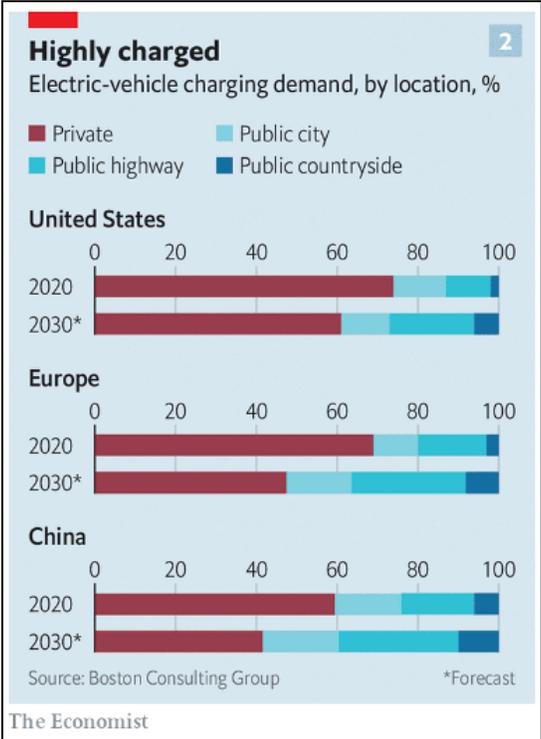
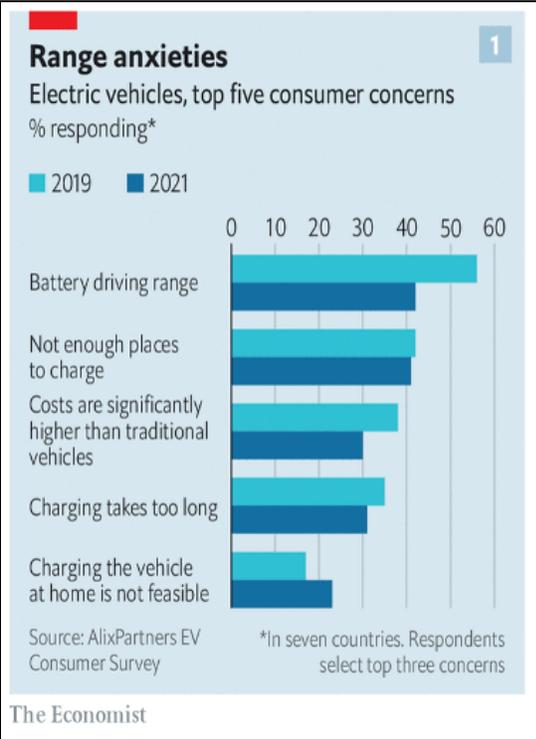
→ **A new Stanford University study analyzes grid stability under multiple scenarios in which clean energy resources power 100% of U.S. energy needs.** It finds that an energy system running on wind, water, and solar coupled with storage avoids blackouts, lowers energy requirements and consumer costs, while creating millions of jobs, improving people's health, and reducing land requirements. Wind, water, and solar already account for almost 20% of U.S. electricity, and 15 states and territories, as well as more than 180 U.S. cities have enacted policies requiring a virtually all-renewable electricity sector. The researchers' scenarios utilize a massive scaling up of offshore wind turbines and rooftop solar panels—none of which take up new land—as well as onshore wind turbines, utility solar panels, and concentrated solar power plants. Overall, they found that new electricity generators would take up about 0.84% of U.S. land versus the approximately 1.3% of land currently occupied by the fossil fuel industry. Under these scenarios, the researchers further found that per capita household annual energy costs were nearly 63% less than present costs. In some states, costs dropped as much as 79%.

#GRN #USA [TechXplore](#)

→ **The UK government will invest more than £116M in Green Tech businesses as part of its push for decarbonization and energy efficiency.** The funding, announced by the Department for Business, Energy, and Industrial Strategy (BEIS), will be used to finance carbon capture projects. It will also fund tech-led efforts to bolster the energy efficiency of UK homes and businesses by finding cleaner, greener ways to heat and power them. The funding will be made available in stages, with the government inviting businesses to bid for a share of £64M to finance new technologies that can be used to capture carbon from the atmosphere. Another £19M of this funding will be offered to businesses specializing in new tech-led decarbonization and energy-saving processes, in support of the government's ongoing Energy Entrepreneurs Fund (EEF) initiative. This is in addition to the £11M in funding the government previously announced would be used to finance the EEF, bringing the total amount of funding set aside for this to £30M. #GRN #GBR [Computer Weekly](#)

→ **The current number of public chargers—1.3M—cannot satisfy the demands of the world's rapidly expanding EV fleet.** According to an estimate by the International Energy Agency (IEA), a global forecaster, 40M charging points will be needed by the end of the decade, requiring an annual investment of \$90B a year as 2030 approaches. But Boston Consulting Group (BCG) forecasts that in the U.S., Europe, and China, the world's main EV markets, there will be only 6.5M. Therefore, the number of cars per charger is predicted to rise steeply, creating a bottleneck for EV charging. In a recent survey by AlixPartners, in the seven countries that make up 85% of global EV sales, the cars' high prices came third on the list of main reasons not

to switch to battery power; the four others were all concerned about charging. #GRN #USA #CHN [The Economist](#)



ADVANCED MANUFACTURING

→ **Scientists have created a 3D-printed vaccine patch that requires no needle, can be self-administered, and has the potential to be used for a variety of vaccinations.** The new vaccine technology, developed by scientists at Stanford University and the University of North Carolina at Chapel Hill (UNC), uses 3D-printed microneedles on a polymer patch barely long enough to reach the surface of the skin to deliver a vaccine. According to a [press release](#) by UNC, the vaccine patch could set the course for a new way to deliver vaccines that's painless and less invasive than a traditional needle, doesn't require special storage, and can be self-administered. Through 3D printing, scientists could create microneedle vaccine patches for the flu, measles, hepatitis, or COVID-19. #MFG #BIO #USA [The Hill](#)

→ **A 3D-printed euthanasia pod has been given legal clearance in Switzerland and will be operational beginning in 2022.** Sarcophagus, the euthanasia system, consists of a coffin-like 3D printed capsule mounted onto a stand that releases nitrogen for inert gas asphyxiation. According to the leading assisted suicide organizations Exit and [Dignitas](#), 1,300 people used their services in Switzerland last year, where the act has been legal since 1942. At present, both firms help those seeking to take their own lives by getting them to ingest liquid sodium pentobarbital, a drug that causes them to fall asleep within five minutes, before slipping into a coma and dying not long after. With its own capsule, [Exit International](#) has developed a device that can be activated from the inside and used without any need for controlled substances. Instead, Sarco works by reducing the oxygen level inside its chamber from 21% to 1% in thirty seconds, causing occupants to die of hypoxia and hypocapnia, as well as oxygen deprivation.



Sarco pods can be operated from the inside by its user and work by reducing internal oxygen levels.
(Source: Exit International)

#MFG #CHE [3D Printing Industry](#)

AUTONOMOUS SYSTEMS

→ **Autonomous vehicle companies are exploring the use of a common language that would help driverless cars communicate their intentions to humans.** For instance, [Argo.ai](#), a developer of self-driving systems, is urging other developers to adopt its new guidelines for safe interactions between autonomous cars and bicyclists. The guidelines urge AV companies to incorporate bike lanes into their AI maps and model typical cyclist behavior into their algorithms. Ford is also developing a standard method for external visual communication for AVs. It is testing different lighting and signal patterns to indicate certain actions that an AV would take, such as pickup or drop-off. Finally, [Zoox](#), a custom robotaxi maker, is testing communication patterns that incorporate a variety of lights and sounds into its design. #AUT [Axios](#)

→ **A new AI method that combines neural learning with common sense reasoning can overcome some of the shortfalls of self-driving vehicles today.** The developed AI method results in AVs learning to understand the world much like humans, which in turn enhances the ability to explain decisions. The researchers who developed the method said that it lets a self-driving vehicle understand a course of events.” For example, the car will understand that a cyclist blocked by a car will reappear and still exists even though it is not readily visible. This level of understanding is essential for AVs to be traffic-ready under different driving conditions and environments. Another advantage of developing AI technologies that see the world like humans is that it enhances the ability for AVs to explain decisions and show why they acted a certain way in traffic. This is something today’s AVs cannot do. #AUT #AI [Tech Xplore](#)

SEMICONDUCTORS & CHIPS

→ **Nvidia’s \$40B acquisition of UK chip designer Arm is unlikely to go through because the deal is facing a growing number of regulatory probes around the world.** The deal was set to be completed by March 2022 but Nvidia admitted that it will go beyond that date. **The merger is facing scrutiny from tech companies and regulatory bodies because it could restrict access to Arm’s “neutral” semiconductor designs and may lead to higher prices, less choice, and reduced innovation.** A week ago, the Federal Trade Commission sued to block the deal, citing that the merger would allow Nvidia to control technology that would undermine its competitors. Simultaneously, the UK government is ordering a “phase 2” probe and the European Commission has also launched an in-depth investigation into the deal. Nvidia argues that its “scale, capabilities, and robust understanding of datacenter computing, acceleration, and AI, we can assist Arm in expanding their reach into data center, IOT and PCs, and advance Arm’s IP for decades to come.” **If the deal gets blocked, Arm might pursue an IPO.** #CHP #GBR #EUR #USA [CNBC](#)

→ **U.S. Commerce Secretary Gina Raimondo discussed chip supply chains during a call with Taiwan and the two agreed to cooperate on tech, trade, and investment through a new mechanism.** This comes as the U.S. continuously presses Taiwan, a major chip producer,

to do more to help resolve the global chip shortage. The U.S. and Taiwan will now cooperate through a new Technology Trade and Investment Collaboration (TTIC) framework to develop commercial programs and explore ways to strengthen critical supply chains. #CHP #USA #TWN #SCRM [CNBC](#)

QUANTUM TECHNOLOGY

→ [Rigetti Computing](#), a pioneer in full-stack quantum computing, announced a collaboration with Microsoft to provide its quantum computers over the cloud to users of Microsoft's Azure Quantum service. Rigetti's computers use superconducting qubits, an approach that has faster execution times and greater scaling than other commercially available quantum computing technologies. This allows Rigetti's computers to solve a broad range of complex and practical real-world problems. The partnership with Microsoft will allow Rigetti to bring its systems to a bigger platform on Azure Quantum, which has a mature community of quantum developers and researchers. The two companies expect the integration to be completed and available to users in the first quarter of 2022. #QNT #USA [Quantum Insider](#)

→ Harvard researchers created and observed a new state of matter called a quantum spin liquid, which can be used to improve quantum computers. For materials to become magnetic, the spins of the electrons in the material need to be highly ordered. The most common type of magnetism, like fridge magnets, works because the spins of all the electrons in the material align in the same direction. Other types of magnetism can arise when the spins of neighboring electrons alternate up and down. However, quantum spin liquid exhibits a useful quantum phenomena, such as entanglement – when atoms can influence each other across vast distances and “teleport” information – and quantum superposition, where atoms can exist in multiple states at once. Both are helpful for building more resilient quantum computers against external influence. #QNT #USA [News Atlas](#)

GEOPOLITICS

→ President Biden virtually hosted around 100 countries during the first US Summit for Democracy this week on Thursday 09 December and Friday 10 December. China and Russia were neither invited nor mentioned when the President spoke out against authoritarianism. The virtual gathering is part of a broader theme Biden has frequently reinforced throughout his time in office - that the global competition of the 21st century is one defined by democracies versus autocracies and America has a responsibility in ensuring democracies prevail. Biden announced the establishment of the Presidential Initiative for Democratic Renewal, which will build on the US' ongoing work to bolster democracy and defend human rights around the world via supporting free and independent media, fighting corruption, bolstering democratic reformers, advancing tech for democracy, and defending free and fair elections. The President faced criticism for his guest list which included representation from nations with spotty records on

democracy, the rule of law, and human rights, including the Philippines, Pakistan, Nigeria, Brazil, and Turkey. #Geopolitics #USA [CNN](#)

→ **The US and the UK announced plans to collaborate on bilateral innovation prize challenges focused on advancing privacy-enhancing technologies (PETs).** According to a White House press release, this emerging group of technologies present an important opportunity to harness the power of data in a manner that protects privacy and IP, enabling cross-border and cross-sector collaboration to solve shared challenges. Announced during the Summit for Democracy, as part of a series of International Grand Challenges on Democracy-Affirming Technologies, the prize challenges will take place during the Summit's "year of action," accelerating work to overcome technical gaps and adoption challenges related to PETs. Building on decades of investment in privacy-enhancing technologies, the White House Office of Science and Technology Policy, the U.S. National Science Foundation, and the U.S. National Institute of Standards and Technology are leading an interagency initiative to jointly develop the challenges with the United Kingdom's expert body for trustworthy innovation in data and AI, the Centre for Data Ethics and Innovation, who will lead a team of specialists from across the UK Government. The United States and the United Kingdom anticipate launching the prize challenges in the spring of 2022, with initial results ready to be shared at the second Summit for Democracy. #Geopolitics #USA #GBR [The White House](#)

→ **China told multinationals to sever ties with Lithuania or face being shut out of the Chinese market after Lithuania joined the US, Australia, the UK, and Canada in a diplomatic boycott of the Beijing Olympics.** China already downgraded its diplomatic ties with Lithuania last month, after the opening of a representative office by Taiwan in Vilnius. Taiwan has other offices in Europe and the US but they use the name of the city, Taipei, avoiding reference to the island itself. Lithuania's direct trade with China is modest, but its export-based economy is home to hundreds of companies that make products such as furniture, lasers, food, and clothing for multinationals that sell to China. #Geopolitics #SCRM #CHN #TWN #LTU [Reuters](#)

CYBERSECURITY

→ **Gen. Paul Nakasone, the U.S.'s top cyberwarrior, said the military is gathering intelligence in a cross-functional effort to combat ransomware groups.** Due to the surge of ransomware attacks against the U.S., the government is taking a more aggressive and cohesive approach. Cyber Command, the NSA, and other agencies have poured resources into gathering intelligence on ransomware groups and sharing it across the government and with international partners. Although Gen. Nakasone did not reveal the specific actions taken by his commands or what ransomware groups were targeted, he said one of the goals was to "impose costs." These operations have already started – in September, Cyber Command diverted traffic around servers being used by Russia-based REvil. And before the 2020 election, Cyber Command

launched an operation against a network of computers known as TrickBot, which could be used to disrupt voting. #Cybersecurity #USA [NYT](#)

→ **The phones of at least nine U.S. State Department employees were hacked using the spyware of NSO, an Israeli spyware maker.** Although it is unclear who launched the attacks, they targeted the iPhones of U.S. officials based in Uganda or working on issues related to the country. This comes as NSO faces heightened scrutiny for the unethical use of its Pegasus spyware. Apple recently filed a lawsuit against the company, accusing it of using Pegasus to hack the devices of its users. WhatsApp also sued NSO for similar reasons. Despite this, NSO has denied accusations made against it and maintains that its hacking tools cannot target American phone numbers. #Cybersecurity #ISR #USA [Al Jazeera](#)

→ **A federal court allowed Microsoft to seize websites being used by a Chinese-based hacking group that was targeting organizations in the U.S. and 28 other countries.** The group, dubbed “Nickel,” was targeting government- and politics-based organizations for intelligence gathering purposes. The court order allowed Microsoft’s Digital Crimes Unit to take control of the websites used by Nickel and redirect the traffic to Microsoft’s secure servers. Although this will not permanently end Nickel’s hacking, it has removed a key piece of infrastructure the group has been using for its latest attacks. According to Microsoft’s intelligence, Nickel consistently uses malware to intrude into company networks, conduct surveillance, and steal data. It is one of the most active hacking groups targeting government agencies and is successful 90% of the time. #Cybersecurity #USA #CHN [The Hill](#)

SUPPLY CHAINS

→ **Supply chains for key materials needed for electric vehicle batteries are still reliant on nations with known human rights abuses and environmental violations.** For instance, cobalt mines in Congo rely on underpaid child labor. Additionally, China’s mining of rare earth minerals has polluted lakes. The U.S. seeks to combat this by increasing domestic mining and processing capabilities and working with allies to ensure that materials used in EVs are sourced ethically. The infrastructure bill passed in November is a significant step towards this goal – it includes \$6B to increase domestic battery materials processing, manufacturing, and recycling, as well as \$140M for a domestic rare-earth demonstration facility, which would extract and refine the materials. Similarly, automakers like BMW began working with a startup to use blockchain to ensure its EVs used “clean cobalt” and not materials mined with child labor. Tesla, Ford, and Volkswagen have also begun using cobalt-free lithium-iron-phosphate batteries in many of its vehicles. #SCRM #COG #CHN [Automotive News](#)

→ **Water shortages in China will exacerbate the supply chain crisis in the U.S. China has been short of the water it needs to maintain its economy, with nearly 700M of its population living in water-stressed regions.** This shortage has also negatively impacted electrical power generation, resulting in major disruptions to China’s manufacturers. Since the U.S. relies on China for imports, fewer products will come to the U.S. at significantly higher

prices as water supplies dwindle in China. China is considering a variety of solutions, including a project to transfer water from South to North China, shifting manufacturing away from water-stressed regions, and atmospheric interventions to boost rainfall. #SCRM #USA #CHN
[The Hill](#)