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Inside C2

Southern DAILY

Make Today Different

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Shanghai hospital warns of 'tragic battle' as COVID spreads

SHANGHAI/BEIJING, Dec 22 (Reuters) - A Shanghai hospital has told its staff to prepare for a "tragic battle" with COVID-19 as it expects half of the city's 25 million people will get infected by the end of next week, while the virus sweeps through China largely unchecked.

After widespread protests against strict mitigation measures, China this month began dismantling its "zero-COVID" regime, which had taken a great financial and psychological toll on its 1.4 billion people.

China's official death count since the pandemic began three years ago stands at 5,241 - a fraction of what most other countries faced - but now looks bound to rise sharply.

China reported no new COVID deaths for a second consecutive day for Wednesday, even as funeral parlour workers say demand for their services has increased sharply over the past week.

Authorities - who have narrowed the criteria for COVID deaths, prompting criticism from many disease experts - confirmed 389,306 cases with symptoms.

Some experts say official case figures have become an unreliable guide as less testing is being done following the easing of restrictions.

Infections in China are likely to be more than a million a day with deaths at more than 5,000 a day, a "stark contrast" from official data, British-based health data firm Airfinity said this week.

Airfinity said it examined data from China's regional provinces, noting that cases are rising quicker in capital Beijing and southern province Guangdong.

The Shanghai Deji Hospital, posting on its WeChat account late on Wednesday, estimated there were about 5.43 million positives in the city and that 12.5 million in China's main commercial hub will get infected by the end of the year.

"This year's Christmas Eve, New Year's Day, and the Lunar New Year are destined to be unsafe," said the private hospital, which employs some 400 staff.

"In this tragic battle, the entire Greater Shanghai will fall, and we will infect all the staff of the hospital! We will infect the whole family! Our patients will all be infected! We have no choice, and we cannot escape."

The post was no longer available on WeChat by Thursday afternoon. A person who answered the hospital's main telephone line said they could not immediately comment on the article.

'SERIOUS CONDITION'

Shanghai residents endured a two-month lockdown that ended on June 1, with many losing income and struggling to find basic necessities. Hundreds died and hundreds of thousands were infected during those two months.



A worker in a protective suit waits for people to take swab samples to test the coronavirus disease (COVID-19) at a nucleic acid testing site, as coronavirus disease (COVID-19) outbreaks continue in Shanghai, China, December 22, 2022. REUTERS/Aly Song

On Thursday, many areas of Shanghai were almost as deserted as back then, with many residents isolating themselves and businesses forced to shut as staff fell ill.

"All our employees are sick," said a supermarket worker surnamed Wang as he was shutting the doors. He said he hoped to re-open on Dec. 30.

COVID-19 outbreak in Shanghai

[1/10] A worker in a protective suit waits for people to take swab samples to test the coronavirus disease (COVID-19) at a nucleic acid testing site, as coronavirus disease (COVID-19) outbreaks continue in Shanghai, China, December 22, 2022. REUTERS/Aly Song

Despite the new infections, the last vestiges of the "COVID Zero" policy are being scrapped. China plans to cut quarantine requirements for overseas travellers in January, Bloomberg News reported, citing people familiar with the matter.

Experts say China could face more than a million COVID deaths next year, given relatively low full vaccination rates among its vulnerable elderly population.

China's vaccination rate is over 90% but the rate for adults who have received booster shots drops to 57.9%, and to 42.3% for people aged 80 and above, government data shows.

Footage from a Beijing hospital on CCTV state television showed rows of elderly patients in the intensive care unit breathing through oxygen masks. It was not

clear how many of them had COVID.

The deputy director of the hospital's emergency department, Han Xue, told CCTV they were receiving 400 patients a day, four times more than usual.

"These patients are all elderly people who have underlying diseases, fever and respiratory infection, and they are in a very serious condition," Han said.

The head of the World Health Organization said it was concerned about the spike in infections and was supporting the government to focus on vaccinating those at the highest risk.

WHO Director-General Tedros Adhanom Ghebreyesus told reporters the agency needed more detailed information on disease severity, hospital admissions and requirements for intensive care units for a comprehensive assessment.

'GREAT PRESSURE'

China's policy U-turn caught a fragile health system unprepared, with hospitals scrambling for beds and blood, pharmacies for drugs and authorities racing to build clinics.

Smaller cities away from the affluent coastal belt are particularly vulnerable. Tongchuan, a city of 700,000 in the northwestern province of Shaanxi, called on Wednesday for all medical workers who retired in the past five years to join the battle against COVID.



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WEA LEE'S GLOBAL NOTES

12/24/2022

A Look Back At The Year Of 2022

2022 is coming to an end. The war in Ukraine, inflation and Covid-19 have not yet disappeared and the energy shortage has really meant a year full of suffering for human beings all around the world.

To be honest, despite the opposition of the international community against Putin's open invasion of Ukraine, his action not only violated international law and the UN charter, this barbaric act caused chaos in the world economy. Putin's ambition did not succeed and has

openly exposed his weakness.

Ukraine's President Zelensky was passionate in his speech to the U.S. Congress and he asked for the full support of the United States and vowed that it is a war to defend freedom and democracy. A large number of missiles and other weapons will be sent to Ukraine and will cause ever more casualties. It is a real disaster how terrible war is.

In the past six months, the interest rate

has been increased again and caused many real estate transactions to be affected.

The influx of a large number of refugees on the Mexican border has continued, even though we have sent in the National Guard to block the people crossing the river into the U.S.

It was a very painful year. We still hope that peace will come as soon as possible.



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Southern DAILY Make Today Different

Editor's Choice



People attend a protest at the UN Climate Change Conference (COP26), in Glasgow, REUTERS/Yves Herman



Pope Francis greets people as he arrives to lead a special audience to deliver a Christmas message to Vatican workers at the Paul VI Hall at the Vatican. REUTERS/Remo Casilli



Miranda Lambert performs on stage. REUTERS/Harrison McClary



Men ride on a horse cart amid fog during morning hours in Peshawar, Pakistan. REUTERS/Fayaz Aziz



Lottery balls are dropped into a rotating lottery drum ahead of the start of the draw of Spain's traditional Christmas Lottery "El Gordo" (The Fat One), at Teatro Real, in Madrid, Spain. REUTERS/Susana Vera



People attend a protest at the UN Climate Change Conference (COP26), in Glasgow, REUTERS/Yves Herman

Taiwan Semiconductor Is Investing \$40 Billion In The State Of Arizona To Boost World Chip Production

Compiled And Edited By John T. Robbins, Southern Daily Editor



A lab technician holds a large circular disc silicon wafer that Taiwan Semiconductor will start producing in 2024 at their Arizona facility. (Image source: Getty Images.)

KEY POINTS

Taiwan Semiconductor will be investing \$40 billion in the state of Arizona to boost world chip production.

The numbers are big, but the two new Arizona facilities will be a drop in the global chip production bucket.

There's plenty of worry out there about what would happen to the global economy if China ever made a more aggressive military push to take back the island of Taiwan. Amid this worry, many companies and government organizations have been pushing Taiwan Semiconductor Manufacturing (TSM -1.14%) -- far and away the largest chip foundry on the planet and a recent addition to Warren Buffett's stock portfolio -- to diversify production into other countries.

But as things turned out, Taiwan Semi has just announced a second fab (a chip manufacturing facility) in the state of Arizona, over a year before its first facility there is complete. The total investment in the two fabs will be in the ballpark of \$40 billion.

This sounds like fantastic news for Taiwan Semi, as well as for chip designers Apple and Nvidia, which will be among the first customers of the new fabs down in the southwestern desert. But two lesser-known names could be the best way for investors to profit: Applied Materials and ASML Holding.

Lots of silicon, but a lot of equipment needed to fill a fab first

Taiwan Semi said its first fab will begin cranking out silicon wafers in 2024, using an enhanced version of its 5-nanometer manufacturing technology (the nanometers referring to the size of the transistors within a chip, with smaller sizes representing more powerful chips). The second fab will start production in 2026 using 3-nanometer tech. Together, the company said it could produce 600,000 silicon wafers a year at max capacity.



For reference, Taiwan Semi's 5-nm and 3-nm manufacturing processes create 300-millimeter wafers (just shy of 12 inches in diameter). Each wafer thus has 113 square inches of surface area (high school geometry here: $\pi \times 6^2$ radius squared), meaning Taiwan Semi could produce nearly 68 million square inches of silicon wafers every year. Sound like a lot? It is. But bear in mind some 14.7 billion square inches of wafers will be shipped in 2022 alone (according to industry association SEMI). That number is expected to increase by about a mid-single-digit percentage over the next few years.

At any rate, though Taiwan Semi's \$40 billion investment will add little to the total global chip production capacity, it's still an incredibly high-value project. These days, the most advanced chips require incredibly complex manufacturing equipment to produce. That's where Applied Materials and ASML come in. As Taiwan Semi constructs its two new fabs, it will be filling up those facilities with advanced machinery from its longtime partners Applied and ASML, with

some pieces of equipment (specifically, ASML's extreme ultraviolet lithography machines) costing a couple hundred million dollars apiece.



In other words, new fabs like the ones being built in the Grand Canyon State mean more growth for Applied Materials and ASML now while Taiwan Semi shareholders wait for that new output to go live.

Another boom in chip demand is coming

In 2022, global chip sales (the actual end product, not the wafers themselves) are expected to be around \$600 billion. That's up from just over \$400 billion in 2019 before the pandemic. The booming demand for silicon-based devices isn't going away anytime soon, though. Analyst and industry estimates now point toward global chip sales surpassing \$1 trillion no later than 2030.

It won't be a straight-uphill growth trend. For example, the value of chips sold is expected to dip slightly in 2023. However, big-ticket consumer goods like automobiles and home appliances are joining the digital era and will look a lot more like your smartphone in the coming years. Something similar is happening in the industrial world, where equipment of all sorts is getting hooked up to a network connection. 5G network infrastructure construction is ongoing, as are data center build-outs to support artificial intelligence and other high-end computing in the cloud.



Besides supporting new fabs in Arizona, Applied Materials and ASML will also be involved in the construction of other sites like Intel's planned mega-fab in Ohio. Dozens of other facilities, like the other 17 fabs that Taiwan Semi owns in Taiwan and China (and one small fab in Washington state), will also need upgrades. Fab equipment also gets old and needs replacing, which also means ongoing sales for Applied and ASML, not to mention ongoing service and software fees.

Taiwan Semi, Intel, and others will get some government assistance via legislation like the U.S. CHIPS Act during this boom in capital spending. However, it remains unknown how profitable these companies will be along the way -- or how profitable they'll be once this boom is all said and done.

Fab equipment sales, though, tout high margins and cost what they cost, regardless of consumer and business end-demand for chips (which impact

manufacturer profit margins). As these machines get more complex, the price tag on them goes up too, which is boosting Applied's and ASML's margins. (Courtesy <https://www.fool.com/investing/2022/12/09/taiwan-semiconductors-arizona-fab-could-mean-big-w/>)

Related
TSMC To Produce 3-Nanometer Chips At Its Arizona Factory



(Image: Getty Images)

TSMC founder Morris Chang said today that the semiconductor giant and Apple supplier will build 3-nanometer chips at its factory in Arizona, though final plans are not ready yet. The factory is currently under construction, with plans to begin production in 2024.

During a press conference in Taipei, Chang said "three-nanometer, TSMC right now has a plan, but it has not been completely finalized," Reuters reports. "It has almost been finalized -- in the same Arizona site, phase two. Five-nanometer is phase one, 3-nanometer is phase two."

On its website, TSMC says its 3-nanometer tech, called N3, will be a full node stride from its 5-nanometer technology and will offer up to 70% logic density gain, up to 15% speed improvement at the same power, and up to 30% power reduction at the same speed when compared to its predecessor. It is targeting volume technology in the second half of this year.

The world's largest foundry, TSMC makes almost half of the world's most advanced chips. The dominance of Taiwan's semiconductor companies (TSMC's peers include Foxconn) is one of its major advantages against China, which considers Taiwan a province, but as worldwide chip shortages stymie the production of electronics, it also calls into question the supply chain's reliance.



TSMC's Arizona factory, along with a second one that is reportedly in the planning stages, is part of the Biden administration's strategy to bolster U.S. chipmaking. TSMC is also building a factory in Japan and is in talks with the German government to build another one in that country.

Other foundries working on 3-nanometer chips include Samsung Electronics, which started producing 3-nanometer chips in June, ahead of TSMC. The South Korean tech giant is producing 3-nanometer

chips at its Hwaseong and Pyeongtaek semiconductor facilities. Samsung said last year it would invest 171 trillion KRW (\$132 billion) in its logic chip and foundry business by 2030, and it is also building a semiconductor plant in Texas. (<https://techcrunch.com/2022/11/20/tsmc-3-nanometer-arizona/>)

Related
Taiwan Semiconductor Plans To Build Second Factory At Its Phoenix Site

Taiwan Semiconductor Manufacturing Co. says it has started construction on a second semiconductor chip plant in Phoenix. Combined with another under-construction plant nearby, the company says it will have invested \$40 billion in the projects.

More than 10,000 construction workers would be involved in building the plants, known as "fabs," TSMC says. Work on the first plant is being led by a joint venture of Dallas-based Austin Commercial and Houston-based CTCL Americas Inc. Neither the contractors nor TSMC immediately responded to inquiries about the team for the second fab.

The first fab is expected to begin production in 2024 and feature 4-nanometer process technology, even more advanced than the 5-nm process that was originally planned. The second fab would feature 3-nm process technology and is slated to come online in 2026. Once completed, the fabs would produce more than 600,000 wafers per year, TSMC says.



TSMC's Phoenix fabs would produce more than 600,000 wafers per year once they begin production, the company says. (Photo courtesy of Taiwan Semiconductor Manufacturing Co., Ltd.)

TSMC is also in planning stages to build an on-site industrial water reclamation plant, the company announced Dec. 6. The plant would allow the plants to achieve "near zero liquid discharge."

President Biden traveled to Phoenix Dec. 6 to speak about the TSMC projects and other manufacturing projects that have benefited from U.S. government spending packages like the Chips and Science Act, which allocated \$39 billion to boost semiconductor chip manufacturing construction in addition to other incentives. Biden touted the projects as an example of manufacturing returning to the U.S. and strengthening the supply chain. Other tech manufacturers are also in the midst of U.S. fab projects, including Micron with a plant outside Syracuse, N.Y. and Intel in central Ohio. Biden was joined at the event by executives from some of TSMC's supplier and customer companies, including Apple CEO Tim Cook.

"These are the most advanced semiconductor chips on the planet--chips that will power iPhones and MacBooks, as Tim Cook can attest," Biden said. "Apple had to buy all the advanced chips overseas. Now they're going to bring more of their supply chain here at home." (Courtesy <https://www.enr.com/articles/55518-taiwan-semiconductor-plans-to-build-second-fab-at-phoenix-site>)

The Fourth Industrial Revolution

Robots, Drones And Sensors Are Changing The Way We Farm

The Future Of Farming Is Here - High-Tech Brings Agriculture Into The 21st Century



Compiled And Edited By John T. Robbins, Southern Daily Editor

Last spring, farmer Brian Tischler was sitting in his tractor when he had an idea. What if his tractor was fully autonomous? Thanks to AgOpenGPS -- a software he developed that tracks where crops are seeded -- he's had more time to think of new ideas to improve his workflow.

Tischler began creating on the spot, envisioning features for the autonomous tractor like remote control via smartphone, the ability to sense obstacles, and geolocation to ensure the tractor stays within a field. Across the farming industry, tech innovations like Tischler's are revolutioniz-

ing the way agriculture is done. These applications come at a critical time. The world population is expected to swell to 9.8 billion by 2050. Climate change and infectious disease are looming threats to livestock production and crop yield.

Tischler made the tractor program open source, sharing it online so farmers from across the globe can download and develop additions. Tischler, who recently won the 2018 ASTech Award for Outstanding Achievement in Agricultural Innovation, views the software as a way of giving back to the farming community. A lot of

leading-edge technology is not affordable for smaller operations.



"What inspires me is connecting with other people who share how they're using [the software]," says Tischler.

Such innovations have made the \$3 trillion industry more efficient, resourceful, and productive. In recent years, there have been varied applications of agriculture technology: crop-watering drones, software that uses satellites to manage nut and citrus orchards, virtual trials of new farming techniques, genomics testing that can ward off food contamination, and more.

Recent innovations have made the \$3 trillion farming industry more efficient, resourceful and productive.

The DJI "Agricultural Wonder Drone" makes it possible for a single farmer to feed or spray pesticide on as much as 80 acres of crops a day. By comparison, a worker on foot may cover less than one acre in the same amount of time. Using the DJI drone, the farmer maps out the field by walking through it and the unit's controller creates a flight path, almost like a flying Roomba.

In Canada, the R2B2 team of scientists are researching rural connectivity and precision agriculture. Their studies utilize digital devices, applications, and databases of geospatial techniques to analyze and respond to variability in the field.

R2B2 looks at how wireless optimization and tools like sensors and drones support sustainable farming practices. For example, by using sensors to measure moisture and nutrients in the soil, farmers avoid loading up fields with excess irrigation and pesticides, saving money and protecting the environment.



Using linked technologies, a connected farm can also employ solar wireless devices like Ecorobotix, a solar-powered weeding robot. Dr. Helen Hambly, R2B2's lead scientist explains, "In the next generation of farming, there is a lot of monitoring done through connected and wireless devices. Wireless has changed things substantially."

These innovations come at a critical time, as the world population is expected to swell and climate change and infectious

disease are looming threats to livestock production and crop yield.

Many farmers have adopted precision agriculture practices. Christian Gastón Palmaz, CEO of Napa's Palmaz Vineyards, created VIGOMany farmers have adopted precision agriculture practices. Christian Gastón Palmaz, CEO of Napa's Palmaz Vineyards, created VIGOR (Vineyard Infrared Growth Optical Recognition), smart software that marries infrared imagery with soil moisture measurements. The algorithmic approach ensures that the vines grow at the same rate and that the exact amount of water needed is used--reducing water use by an estimated 20 percent.

Palmaz says, "Big data analytics has had a profound impact on understanding and addressing slight amounts of difference, which would otherwise propagate over time."



Technology can also help manage livestock wellness and reproduction. Remote Insights developed ear tags that monitor sows' behavior, movements, eating and drinking. The data is collected and analyzed to check that the animal has a healthy appetite and normal mobility. Moocall created monitors to check when a female cow is in heat and a pregnant one is ready to give birth. Such forward-thinking equipment can save a farmer numerous trips to the field or barn to review the herd. There's palpable excitement within the field about the myriad of technological possibilities, strengthening old farming traditions, by using technology to answer existing needs. As Hambly says, "This is the farming of the future." (Courtesy <https://www.verizon.com>)