EIPC SPEeDNEWS

The Weekly On-Line Newsletter from the European Institute of Printed Circuits.
Issue 21 - June 2021

NEWS FROM THE EIPC

For those unable to attend our recent 9th Technical Snapshot themselves, a read of the review by Pete Starkey is the next best thing. Some would claim that it is actually better, as it saves them from having to concentrate for more than 5 minutes at a time. Happily, Pete's concentration is legendary, as you may see in the link below if you open it.

http://pcb.iconnect007.com/index.php/article/128006/eipc-technical-snapshot-review-microvia-reliability-issues/128009/?skin=pcb

With our best regards to you, and our thanks to the moguls at iConnect.
The EIPC Team

The European Institute for the PCB Community

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NEWS FROM NORWAY

Elmatica delivers the best financial result in 50 years

2020 was the tenth consecutive year of financial records for Elmatica, announcing the best annual financial results in the year of their 50th anniversary.

Elmatica delivered its best financial result ever in 2020, revenue increased by 7.5% based on organic growth only, while the EBITDA increased by 16.25%.

“I am humble and extremely proud to present such results achieved in a year filled with unpredictability and challenges, of course it's extra special to present it the year of our 50th anniversary. The growth of 2020 was something I never would have anticipated”, says CEO Didrik Bech.

Important with a global partner base
Elmatica has secured the PCB supply chain for industry leaders since 1971, focusing on delivering predictability and security for PCB production, design and the supply chain. Even though the financial results are strong, Elmatica has felt the impact of COVID and experienced how the pandemic has challenged the manufacturing capacity to its limits and stressed the importance of having a solid and flexible global manufacturing base in Asia, Europe and USA.

“One of our advantages, in addition to our diverse portfolio, experience and reliable partners, is our agile and easy scalable business set-up with a decade-long focus on digitalization. This focus allowed Elmatica to be prepared for the COVID pandemic. It gave us the ability to assist our customers in prioritizing orders, provide quick overviews of the order situation and offer dual manufacturers for critical orders. Ensuring independent manufacturing operations that can be operated from a distance, is the best way to prepare”, says Bech.

COVID restrictions no hindrance
COVID restrictions with remote work space was no hindrance, as flexibility in workspace has been implemented since 2012.

“As we already had the routines and home office set-up implemented many years ago, it allowed us flexibility in the workplace. We experienced no “down time” and could perform

business as usual. The only difference was an increased focus on internal communication, activities and new digital “meeting points”, says Bech.

Business opportunities and expansions
For business opportunities and industry demand, COVID has impacted the entire PCB supply chain. However some industries have been more affected than others.

“We saw a significant increase in demand, up to 30%, on orders related to the Medical industry last year, this increase has started to stabilize. The automotive industry has faced a serious decrease, whilst the defence industry is ramping up”, says Bech.

Elmatica expanded with 6 new colleagues last year, which represents a 15% growth in our colleague base, while maintaining a unique company culture during challenging times. The outlook for 2021 is much more promising than 2020, with a present 68% increase in order booking.

“The current raw material availability, lead time situation and production capacity is causing disruptions in the supply chain on a global level, despite this, and with our stable portfolio, we aim for a 15-30% increase in revenue in 2021”, says Bech.

For questions, Guro Krossen, guro.krossen@elmatica.com

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ELECTRONIC INDUSTRY NEWS

Component shortage to persist, PC vendors say

- By Lisa Wang / Staff reporter Taipei Times

Major PC vendors expect a shortage of key components to last another 12 months until the second quarter of next year, when PC demand wanes after two years of robust expansion, a UBS analyst said yesterday.

Concern has risen among investors that PC demand could weaken as the US and European economies reopen from COVID-19 lockdowns and gradually return to in-person business activities.

At the annual Taiwan Conference that began on Monday, UBS analysts said they had similar discussions with companies in PC supply chains, and the feedback from major PC vendors indicated that demand remained quite strong on the back of slim inventories of two to three weeks, compared with the normal six to eight weeks.

PC supply still lagged consumer demand, with a gap of 20 to 30 percent, UBS head of Taiwan hardware industry Grace Chen told a virtual media briefing.

Key component supply constraints remain the choke point, she added.

“For PCs, the component shortage is mainly IC related, like driver ICs and power management ICs. The panel shortage is not very serious now,” Chen said in an e-mail to the Taipei Times

She expects global PC shipments to continue growing at a double-digit percentage sequentially this quarter and next quarter before decelerating in the second half of this year.

For the full year, global PC shipments are forecast to grow between 10 and 20 percent annually, Chen said, adding that growth would be slower next year.

As major PC vendors unanimously expect key component supply constraints to start easing in the second quarter next year, PC supply and demand could reach a parity by then, she said.

Aside from the PC industry, electric vehicles might be a new growth driver for local hardware manufacturers, Chen said.

The production value of electric vehicles, which consume many more chips and electronic components than conventional vehicles, is expected to be double or triple that of PCs and mobile phones combined in the next 10 years, she said.

Electric vehicles are one key area that Hon Hai Precision Industry Co, an iPhone assembler, has been investing in to secure growth, chairman Young Liu said in his keynote speech at the conference.

Hon Hai last year cofounded an electric vehicle development alliance called MIH, which now has more than 1,600 members from the auto, electronics and software sectors, he said.

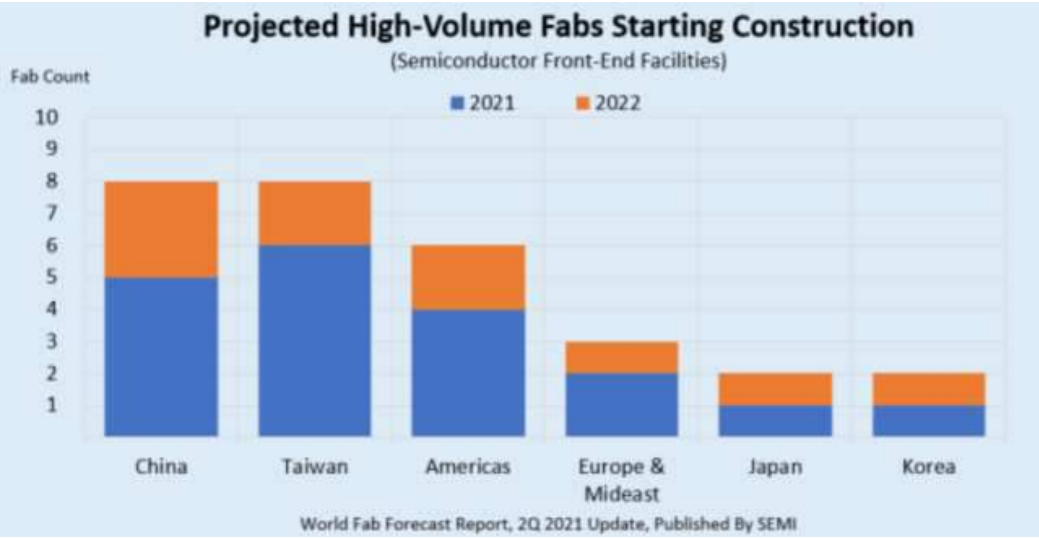
Chip Makers Respond to Demand Surge

By George Leopold EE Times

As we reported, Globalfoundries broke ground this week on a new 300-mm fab in Singapore, one of a projected 19 new high-volume fabs to be built by the end of this year, according to the industry group SEMI.

Those fabs along with another ten expected to be built in 2022 respond to insatiable demand for semiconductors, fueling an equally vibrant chip equipment sector expected to surpass $140 billion over the next several years, according to a SEMI forecast.

Taiwan Semiconductor Manufacturing Co. (TSMC) and other Taiwanese chip manufacturers are projected to construct six new fabs in the coming year, with two more coming online in 2022. TSMC has said it plans to invest about $100 billion over the next three years to increase foundry capacity.



Source: SEMI (Click on image to enlarge.)

Not far behind, Chinese manufacturers are expected to keep pace over the next 18 months, with a half-dozen new North American fabs planned by the end of next year.

Fabs such as the new Globalfoundries facility in Singapore that will produce 300-mm wafers account for most of the new capacity, SEMI said. No less than 15 300-mm lines are under construction, with seven more planned in 2022. SEMI said those seven will consist of a mix of 200-, 150- and 100-mm production lines geared toward meeting unrelenting demand of automotive, 5G and Internet of Things components.

Fifteen of the 29 new fabs projected by SEMI will produce upwards of 30,000 wafers monthly. A key driver is the memory sector, that will account for at least four dedicated fabs over the next 18 months. Once up and running, those facilities could be producing as many as 400,00 wafers per month, the industry group estimates.

While foundry construction is well underway, SEMI cautioned this week that it does not expect chip makers to begin installing lithography and other equipment until 2023 “since it takes up to two years after ground is broken to reach that phase.”

Still, some chip makers may begin installing IC equipment as early as next year, the industry group added.

Which acknowledges a key point: Despite all the recent talk about reviving U.S. chip manufacturing and building resilient technology supply chains, it will take a while to ramp up semiconductor production. A major focus, observers note, is how much capacity TSMC and Intel bring online in the U.S., particularly hoped-for expansion in Arizona.

If and when that U.S. capacity comes online, SEMI said the IC equipment sector heavily focused on North America and Europe suppliers is bound to prosper for the foreseeable future.

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PANDEMIC NEWS

The next pandemic is already here. Covid can teach us how to fight it.

We've known the dangers of antimicrobial resistance for years. What if we used what we learned from Covid to tackle it?

- By **Maryn McKenna archive page**

June 23, 2021

It was August 2017, and pleasant and breezy in the central mountains of Madagascar. The passengers loading their bags into the minibus leaving Ankazobe, a small town in the highlands, were grateful for the morning coolness. It would be warm and sticky on the trip they were taking to Antananarivo, the island's million-person capital 100 kilometres to the south, and then to Toamasina on the coast, another 350 kilometres away. One of the passengers, a 31-year-old man, looked uncomfortable already. Four days before, he had arrived on a visit. Now he was headed home, but he was feverish, achy, and shaking with chills.

He never made it. The man died in the minibus after it drove through the capital; the panicked driver dropped his body off at a hospital and then continued toward the coast.

Within days, 31 people linked to the taxi trip and the hospital fell ill, and four died. Two weeks later, a woman with no known ties to the trip died in the densely packed capital. Shortly after, doctors discovered what was killing them: plague. By early October, there were 169 cases scattered across the island nation. By the end of the month, there were more than 1,500.

Small outbreaks of plague occur every year in Madagascar, transmitted by fleas that live on rats whose numbers boom after the rice harvest. This was not like those outbreaks, though. It arrived before the harvest was over. It spread primarily in cities, not the countryside. And, most important, it wasn't bubonic plague, the historically dreaded but actually not very contagious form of the disease. Instead, it was pneumonic: highly contagious, transmitted by coughing and breathing, and lethal within 24 hours if not treated right away.

With $1.5 million in emergency assistance and 1.2 million doses of antibiotics from the WHO, Madagascar managed to contain the epidemic. But by the time it subsided, at the end of November, it had caused 2,348 cases and 202 deaths. Still, epidemiologists were

conscious of having dodged a catastrophe—not just because the fast-moving, potentially fatal illness could have spread worldwide.

Twenty years earlier, in a small seasonal outbreak, Malagasy and French researchers had discovered a strain of plague that was resistant to almost all the antibiotics used against it. If that strain had been responsible for the 2017 outbreak, it would have been untreatable. The result could have been as grim as the plague epidemics of the past: the Manchurian Plague that killed 60,000 people in China in 1910; the Justinian Plague that destabilized the Byzantine Empire in 540; the Black Death, which killed an estimated 50 million and wiped out half the population of Europe.

Such a catastrophe would not have surprised the global circle of scientists who monitor the bacterial world's ceaseless struggle against the antibiotics we use to contain it. While covid-19 drew our attention to the threat of viruses, microbiologists have long worried that we have forgotten the threat of bacterial epidemics, and the looming danger that bacteria will become resistant to the drugs we rely upon.

"Antimicrobial resistance may not seem as urgent as a pandemic, but it is just as dangerous," Tedros Adhanom Ghebreyesus, director-general of the World Health Organization, said in November, calling it "one of the greatest health threats of our time."

In 2014 the Review on Antimicrobial Resistance, a research group put together by the British government, estimated that antibiotic resistance kills 700,000 people around the world each year, a number that was horrifying then but seems small in comparison to the spiraling losses of covid-19. But the researchers also predicted that if nothing was done, the death rate by 2050 would reach 10 million per year— almost three times covid-19's toll so far.

In other words: Covid took us by surprise, but we already know another health crisis is coming, and now we know how to deal with it.

The response to covid-19 shows what can be accomplished when focus, determination, and vast amounts of money are all directed at one target. The pandemic reorganized the everyday practice of science, the pace of clinical trials, and the willingness of governments to provide funds for that work. With a similar effort applied to antibiotic resistance, we might reorganize trial design, create new surveillance networks to detect resistant pathogens as they emerge, and devise new ways to fund drug development.

Or, to state this more simply: we need to treat antimicrobial resistance as an emergency too. Because it already is.

The math of antibiotics

It is dizzying to look back 18 months, to before the pandemic began, and remember that Covid-19 had never been seen before—and therefore there were, of course, no vaccines against it. What we've achieved by now—with eight vaccines approved, almost 100 more in trials, and more than 2.7 billion doses administered worldwide—was possible only because extraordinary amounts of funding were allocated and rules were changed to make it easier to produce drugs.

The US government gave $18 billion to Operation Warp Speed to fund vaccine and treatment research and production. It streamlined clinical trials, allowing vaccines to enter

the market without full approval from the Food and Drug Administration. And it agreed to purchase up to 900 million doses of vaccine from six companies if their formulas passed FDA scrutiny.

"Antimicrobial resistance may not seem as urgent as a pandemic, but it is just as dangerous."
Tedros Adhanom Ghebreyesus, director-general of the World Health Organization

Those grants and promises guaranteed the vaccine manufacturers an income, while relieving them of almost all the financial risks of drug development. Drug makers often talk about navigating the "valley of death," the difficult-to-fund gap between making a promising discovery and concluding clinical trials. Operation Warp Speed took the valley and laid a six-lane suspension bridge over it.

Antibiotics makers look at these guarantees wistfully. It's hard to turn a profit on new antibiotics—even ones that could deal with a bacterial pandemic. Antibiotics are cheaper than other drugs sold in the US, but hospitals and physicians feel pressure to use them conservatively to keep resistance from emerging.

Those two influences combine to keep revenues so low that almost all the firms that created antibiotics in the 20th century have left the sector. The last new family of antibiotics was a product of those big-company research programs; it debuted in 2003.

The gap they left has been filled by small biotech companies, with small staffs and a small number of products. Sometimes they have no approved drugs in production at all, leaving them exposed to a second valley of death: the one between achieving licensure and earning enough revenue to be sustainable. Most don't make it. Since 2018, multiple small companies making new antibiotics—including Achaogen, Aradigm, Melinta Therapeutics, and Tetraphase Pharmaceuticals—have gone bankrupt or sold off their assets.

The math that explains why is uncomplicated. It takes up to $1.5 billion to shepherd an antibiotic all the way through approval, but the average income from a new drug is just $46 million a year. The Review on Antimicrobial Resistance has estimated that a new antibiotic doesn't reach profitability until 23 years after its development. That's 13 years after going on sale, and just two years before generic versions can compete against it. Most small companies simply can't afford to wait that long.

"Investors look at this and say: 'Why should I put money in a company that is not going to be able to see a return on investment?'" says Ramani Varanasi, who was president and CEO at X-Biotix Therapeutics until it shut down its research programs in April.

Operation Warp Speed solved that problem for Covid by throwing money at research teams that had survived on crumbs. The question is whether a Warp Speed for novel antibiotics could find support to do the same.

"You can always put off investing in tunnel maintenance, until the day the tunnel fails," says Kevin Outterson, a Boston University law professor who founded and leads CARB-X, a nonprofit that has gathered almost $500 million in philanthropic and government funds to support early-stage antibiotics research. "Antibiotic effectiveness is like that: It's something that is valuable to all of society, and if we don't make these investments to keep it up, we'll regret it."

Growing resistance

Antibiotics date to Sir Alexander Fleming's serendipitous discovery in 1928 that a substance excreted by mould on his laboratory plates was killing the bacteria he had cultured there. The mould was producing the raw version of penicillin, which after a decade of further research was turned into the first modern antibiotic.

Antibiotics are complex molecules that interfere with cellular reproduction in a range of ways—compounds that are made by organisms to compete with other organisms. By adopting them for human use, medicine stepped into the middle of an endless evolutionary battle in which bacteria both produced weapons against each other and developed defences against those weapons. Fleming understood this. In 1945, three years after penicillin was first distributed to troops in World War II, he predicted that bacterial evolution—antibiotic resistance—would eventually undermine the new drugs. He said at the time that the only remedy was to use them conservatively, so that the bacterial world would be slow to adapt.

For the first few decades after penicillin's introduction, bacterial adaptation and drug discovery leapfrogged each other, keeping antibiotics' ability to treat infections in front of pathogens' skill at evading them. But by the 1970s, that midcentury burst of innovation had faded. Making antibiotics is hard: the drugs have to be nontoxic to humans but lethal to bacteria, and they must use mechanisms that dangerous bacteria haven't yet evolved defences against. But moving from antibiotics produced in nature to synthesizing compounds in a lab was even harder.

Resistance, meanwhile, leaped ahead. Overuse in medicine, agriculture, and aquaculture spread antibiotics through the environment and allowed microbes to adapt. Between 2000 and 2015, use of the antibiotics that have been reserved for the most lethal infections almost doubled worldwide. Levels of resistance differ by organism, drug, and location, but the most comprehensive report done to date, published in June 2021 by the WHO, shows how fast the situation has changed. Among the strains of bacteria that cause urinary tract infections, one of the most common health problems on the planet, some were resistant to a common antibiotic up to 90% of the time in certain countries; more than 65% of the bacteria causing bloodstream infections and more than 30% of the bacteria causing pneumonia resist one or more treatments as well. Gonorrhea, once an easily cured infection that causes infertility if left untreated, is rapidly developing resistance to all the drugs used against it.

At the same time, resistance factors—the genes that control bacteria's ability to protect themselves—are travelling the globe. In 2008, a man of Indian origin was diagnosed in a hospital in Sweden with a strain of bacteria carrying a gene cluster that allowed it to resist almost all existing antibiotics. In 2015, British and Chinese researchers identified a genetic element in pigs, pork in markets, and hospital patients in China that allowed bacteria to defuse a drug called colistin, known as an antibiotic of last resort for its ability to tackle the worst superbugs. Both those genetic elements, hitchhiking from one bacterium to another, have since spread worldwide.

In the face of drug development's difficult economics, antibiotic research has not kept up. In March, the Pew Charitable Trusts assessed the global pipeline of new antibiotic compounds. Though the group found 43 somewhere in preclinical or clinical research stages, it

determined that only 13 were in phase 3, only two-thirds of those would be likely to make it through to licensure—and none possessed the molecular architecture to work against pathogens that are already the most difficult to treat.

Lessons from Warp Speed

So what would an Operation Warp Speed for antibiotic resistance look like?

The antibiotic pipeline needs a boost in several key areas: basic research, trial design, and post-approval incentives. Fortunately, the global response to Covid created precedents for all three.

The first step would be supporting basic research in the long term. The Moderna and Pfizer-BioNTech vaccines were ready to go less than a year from the first recognition of human infections. But that readiness came from 10 years of basic research with no specific disease in mind. Once Covid appeared, Warp Speed brought the Moderna vaccine to the finish line with extra research funding. (Pfizer didn't receive research support from Warp Speed, but both companies got funds for manufacturing and production.)

It took a pandemic, but the US finally has (some) centralized medical data

Covid exposed the fragmented reality of US health records. Now an effort to bring together data from millions of patients is starting to show results.

Most early research funding for antibiotics currently comes from a patchwork of investment and philanthropy. So the first lesson of the Covid response may be that basic research into antibiotic compounds needs more support, more broadly distributed—because no one knows which research team will be the next Moderna or BioNTech.

The Covid response demonstrated regulators' willingness to talk with companies and modify trial procedures to get a faster result. Changes included allowing clinical trials to drop placebo components, for example, or letting participants know which compounds they received. Antibiotic trials can struggle to recruit enough patients, so the prospect of simplified or smaller trials—the kind authorized for rare-disease drugs, for instance—could make a difference in keeping a research program funded.

Antibiotic developers talk about "push" and "pull" incentives. Pushes provide enough funding to propel an antibiotic research program up to the point of approval; pulls contribute a second tranche of cash that carries a new drug through post-approval marketing, surveillance costs, and shortfalls in earnings until they reach profitability. Most of the funding sent toward antibiotic research now constitutes push incentives, designed to kick-start research.

But Warp Speed was both push and pull: it included not just research support but funds for scaling up manufacturing and guarantees that the vaccines would be bought. That two-tiered funding structure could set a pattern for a way of supporting new antibiotics long enough to let them find their footing.

“These are commercial products, but they are also public health goods that we need to remain viable,” says Phyllis Arthur, vice president of infectious diseases and diagnostics policy for the industry organization BIO. “They’re supposed to be kind of behind glass. But being behind glass means that there’s no ROI that makes sense, so you have to do something that captures their value without putting the onus on the commercial market to provide it.”

There are existing proposals that would funnel more cash to antibiotics makers, but without the urgency of an event as apocalyptic as the covid-19 pandemic, they have not yet won enough public or political support to launch.

In the US, several pieces of legislation that could help are awaiting scrutiny in Congress. One, called the DISARM Act, aims to improve the market for newly produced antibiotics by creating financial incentives that encourage hospitals to purchase and use them. Right now, government reimbursement for hospital care encourages health-care institutions to use less-expensive drugs first, and more-expensive, newer drugs if the first round doesn’t work—a situation that fosters resistance without getting manufacturers the sales revenue they need.

We need to treat antimicrobial resistance as an emergency too. Because it already is.

The creators of the second proposal, known as the PASTEUR Act, have called it a “Netflix for antibiotics.” It proposes federal payments to companies that bring out novel antibiotics, as a way of guaranteeing the drugs’ availability in the future. (The act is based in part on an antibiotic subscription model introduced by the government of the United Kingdom last summer, which would pay lump sums to companies at the start of antibiotic research programs in exchange for guaranteed access to the drugs once they are developed.)

But in the same way that Operation Warp Speed opened the door for more appropriations—the Biden administration committed $500 million in March to a new national centre for forecasting possible epidemics, for example—the realization that we are increasingly vulnerable to bacterial infections might inspire even bolder actions. Governments could plan for new antibiotics the way militaries plan for new planes and tanks, providing the weaponry for imagined battlefields with contracts that extend years into the future.

Brad Spellberg, the chief medical officer of Los Angeles County + University of Southern California Medical Centre, has proposed a different model for antibiotic development: endowing nonprofits that would continuously develop new compounds but not go through the expense of clinical trials.

The point, he says is that companies seeking profit must focus on getting one drug at a time through approval—but to defeat resistance, society needs multiple drugs and a predictable supply of new ones. “You want to have a steady, slow drip every few years of new needed molecules,” he says, “so that when there is a new, emergent pathogen, you can pull a drug out of the bullpen and do rapid clinical trials, the way that has been done with Covid.”

The boldest idea inspired by the Covid response might not be about investing in making drugs, however. Instead, it could be about investing in the people who make them. As big antibiotics makers left the field and small companies crashed, the teams that did the work were broken up and lost; almost all the antibiotics we consume today were developed by people who have since retired, and few researchers are vying to replace them.

“If you’re an up-and-coming young scientist and you’re looking at the big problems you can tackle, but you understand that they have to be financed in some kind of way, picking antimicrobial resistance as the lane you’re going to go down is almost career suicide,” says Gerry Wright, director of the Michael G. DeGroote Institute for Infectious Disease Research at McMaster University.

If the first lesson of the Covid response was the value of funding basic research over time, maybe the last should be the value of finding researchers—for this pandemic, and for the next one too.

“If I were going to make a big play, I would invest in people,” Wright says. “Graduate students, postdocs, assistant professors, associate professors. Pay their salaries. Give them money to take risks, because solving this problem will mean taking enormous risks. There’s no shortage of brains. It’s just a shortage of opportunity.”

A quiet warning

Last week, deaths from covid-19 in the US topped 600,000. Worldwide, the toll of death from the disease crept above 3.8 million. At this moment, cases have topped 178 million.

Among those enormous numbers, it would have been easy to miss a small bulletin that was also published last week. In the province of Ituri in the northeast corner of the Democratic Republic of the Congo, health officials announced that 19 people had fallen ill, and 11 people had died. They had pneumonic plague, the same disease that had killed hundreds in Madagascar four years ago. Samples taken from the victims had been shipped to a regional lab, the announcement said, but there was no immediate notification of what they might show.

In the avalanche of terror and grief caused by covid-19, the news was barely the fall of a pebble. But it ought to be a reminder that pebbles can trigger avalanches too. Covid was the pandemic that took us by surprise; it will be on us if we allow antimicrobial resistance to do the same.

News from WECC members

WECC World Electronic Circuits Council

Issue 21– June 2021

NEWS FROM THE IPC

North American PCB Industry Sales Up 9.1 Percent in May

IPC releases PCB industry results for May 2021

BANNOCKBURN, Ill., USA, June 25, 2021 — IPC announced today the May 2021 findings from its North American Printed Circuit Board (PCB) Statistical Program. The book-to-bill ratio stands at 1.11.

Total North American PCB shipments in May 2021 were up 9.1 percent compared to the same month last year. Compared to the preceding month, May shipments fell 0.2 percent.

PCB bookings in May rose 24.1 percent year-over-year. Bookings in May increased 12.8 percent from the previous month.

"The PCB industry enjoyed higher orders in May, while shipments were flat with the prior month. PCB shipments, like much of the electronics industry, are being impacted by higher raw material costs and longer lead times for some of these key materials," said Shawn DuBravac, IPC's chief economist. "The industry will continue to face these constraints in the coming months until markets regain equilibrium."

Detailed Data Available

Companies that participate in IPC's North American PCB Statistical Program have access to detailed findings on rigid PCB and flexible circuit sales and orders, including separate rigid and flex book-to-bill ratios, growth

trends by product types and company size tiers, demand for prototypes, sales growth to military and medical markets, and other timely data.

Interpreting the Data

The book-to-bill ratios are calculated by dividing the value of orders booked over the past three months by the value of sales billed during the same period from companies in IPC's survey sample. A ratio of more than 1.00 suggests that current demand is ahead of supply, which is a positive indicator for sales growth over the next three to twelve months. A ratio of less than 1.00 indicates the reverse.

Year-on-year and year-to-date growth rates provide the most meaningful view of industry growth. Month-to-month comparisons should be made with caution as they reflect seasonal effects and short-term volatility. Because bookings tend to be more volatile than shipments, changes in the book-to-bill ratios from month to month might not be significant unless a trend of more than three consecutive months is apparent. It is also important to consider changes in both bookings and shipments to understand what is driving changes in the book-to-bill ratio.

IPC's monthly PCB industry statistics are based on data provided by a representative sample of both rigid PCB and flexible circuit manufacturers selling in the USA and Canada. IPC publishes the PCB book-to-bill ratio by the end of each month.

North American EMS Industry up 1.9 Percent in May

IPC releases EMS industry results for May 2021

IPC have announced the May 2021 findings from its North American Electronics Manufacturing Services (EMS) Statistical Program. The book-to-bill ratio stands at 1.55.

Total North American EMS shipments in May 2021 were up 1.9 percent compared to the same month last year. Compared to the preceding month, May shipments fell 3.9 percent.

EMS bookings in May rose 10.5 percent year-over-year and but decreased 19.2 percent from the previous month.

"The electronics manufacturing supply chain remains constrained. While we did see a stepdown in bookings in May, shipments have not been able to keep up with elevated order flow in recent months," said Shawn DuBravac, IPC's chief economist. "Shipments are likely 40 to 50 percent below where they should be given current order volume. I expect shipments will continue to lag bookings given ongoing supply constraints including higher prices and longer lead-times."

Detailed Data Available

Companies that participate in IPC's North American EMS Statistical Program have access to detailed findings on EMS sales growth by type of production and company size tier, order growth and backlogs by company size tier, vertical market growth, the EMS book-to-bill ratio, 3-month and 12-month sales outlooks, and other timely data.

Interpreting the Data

The book-to-bill ratios are calculated by dividing the value of orders booked over the past three months by the value of sales billed during the same period from companies in IPC's survey sample. A ratio of more than 1.00 suggests that current demand is ahead of supply, which is a positive indicator for sales growth over the next three to twelve months. A ratio of less than 1.00 indicates the reverse.

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months is apparent. It is also important to consider changes in both bookings and shipments to understand what is driving changes in the book-to-bill ratio.

IPC's monthly EMS industry statistics are based on data provided by a representative sample of assembly equipment manufacturers selling in the USA and Canada. IPC publishes the EMS book-to-bill ratio by the end of each month.

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International Diary

2021

10th EIPC Technical Snapshot Webinar
Registrations via www.eipc.org
July 14

11th EIPC Technical Snapshot Webinar
Registrations via www.eipc.org
September

EIPC @ FED Conference
Bamberg
16 & 17 September

12th EIPC Technical Snapshot Webinar
Registrations via www.eipc.org
October

EIPC @ Productronica 2021
Messe Munchen
16-19 November