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Update

CES 2023 Conference Takeaways: First Post-Pandemic Show Highlights New Consumer Tech; While Flashy AI-Cars and Barista Robots Make Headlines, Five Major Trends Observed that will Impact Consumer Tech Demand.

Summary and Recommendation.

The Consumer Electronics Show (CES) 2023, held in Las Vegas, Nevada from January 5 to 8, showcased some of the latest and greatest advancements in consumer technology. The Las Vegas Convention Center and the Venetian Expo were filled with headline-grabbing products that impressed the crowds, such as a BMW's color-changing car with AI sass, wireless kettles, and holograms. Looking past the glam, we identified five major themes that will shape 2023 — Batteries, Health Tech, Manufacturing Shift, the Smart Home, and Sustainability — each with a differing impact on our coverage companies. In our coverage universe: HeartBeam, Inc. (NAS: BEAT) and SKYX Platforms (NAS: SKYX) stand to benefit from the favorable industry environment.

Key Points

- **CES Is a Major Catalyst for Consumer Tech Sales.** Although CES is a tech trade show where the latest and greatest new tech is unveiled, its most important value is the role it plays among vendors, distributors, and retailers and the deal-making that is done behind the scenes. Most of these deals are done privately and have a major impact on what comes to market in the 4th quarter of any given year.
- **CES 2023 – Back to Normal-ish.** CES 2023 marked the first “real” year the show was back in full swing since the pandemic. The Consumer Technology Association, which puts on CES, estimated that the 2023 show would have 100K+ attendees and 3K exhibitors — more than double the 2022 attendance, but still 70K attendees shy of pre-pandemic CES 2020. CES comes on the heels of a challenging year for tech, featuring widespread layoffs, decades-high inflation and likely more government regulation. Nevertheless, conglomerates like Samsung showed up with impressive TVs, while newer entrants like John Deere impressed with their pitches for innovation.
- **Batteries: Demand for Bigger, Better, and Safer.** Owing to the growing popularity of electric vehicles and portable consumer electronics, batteries were the one product category visible across the showroom floor. Underpinning the battery tech innovation is a shift toward new, innovative metals and electrolytes, replacing the bulky and flammable liquid electrolyte found in most lithium batteries to provide higher performance while offering superior battery safety. Overall, CES showed that battery makers are moving briskly to adopt innovative materials to improve battery performance and safety, creating a sustained demand surge for battery material manufacturers in the coming years.
- **Health Tech: Patient Monitoring and OTC Hearing Aids Dominate.** Health tech took center stage at CES with new patient monitoring products and technologies unveiled. Based on what we saw at CES 2023, we expect more home health monitoring devices to hit the market, ranging from the traditional wrist-worn trackers and smart rings to sensor-filled toilet seats and bathmats. However, patient monitoring products, especially those that have secured insurance reimbursement in advance or utilize existing DRG codes, will likely see traction, especially if they fit into a provider's workflow.
- **Manufacturing: Moving Away from China to the Rest of the World.** Fewer Chinese companies exhibited at CES 2023 than in prior years, amid geopolitical tensions that pushed foreign firms to diversify manufacturing operations. We see this as a reflection of American companies' efforts to diversify their supply chains away from China toward less risky regions.
- **The Smart Home: Matter Protocol Should Spur Smart Home Tech Adoption.** After many years of delay, Matter, the open-source, universal smart home protocol backed by Amazon, Apple, Google, Samsung and many others, is finally being embraced by new and old device makers. With the Matter protocol in place, smart home adoption should accelerate, in our opinion, as consumer hesitation fades. We also foresee a new focus on consumer tech devices that double as Wi-Fi routers to serve as the main conduit for the Matter-centric smart home.
- **Sustainability: Companies are Finally Paying Attention.** Practically every company that we met at CES talked about how its products would be more sustainable. For example, Samsung discussed its partnership with Patagonia to reduce microplastics in the water supply. Apparently, one of the Consumer Technology Association (CTA)'s key priorities this year was calling attention to the social and environmental impact on tech. The fact that companies are starting to take sustainability more seriously is an indication to us that consumers are starting to care.
- **Gunnar Coverage Universe Impact.** HeartBeam's (NAS: BEAT) – Buy Rated, \$9 PT – portable, credit-card-sized heart attack detection device should benefit from the new interest in patient monitoring products and technologies. We believe BEAT's practical, portable tech should garner provider interest, owing to its inclusion in the patient flow and existing DRG reimbursement codes. SKYX Platforms (NAS: SKYX) – Buy Rated, \$8 PT – stands to benefit from the adoption of the Matter protocol, which should encourage more consumer adoption of the technology. With its strategically located ceiling plug, SKYX could emerge as the Wi-Fi nexus hub for the smart home.

I. Intro

The Consumer Electronics Show (CES) 2023, held in Las Vegas, Nevada from January 5 to 9, presented some of the biggest advancements in consumer technology. The Las Vegas Convention Center and the Venetian Expo were filled with headline-grabbing products that impressed crowds, such as BMW’s color-changing car with AI sass (See Figure 1), wireless kettles, and barista robots (See Figure 2). While the majority of products shown are not likely to be purchasable by consumers anytime soon, CES is nonetheless an opportunity for companies to demonstrate how they envision the future of tech. We gathered several key themes and observations by walking the floors, talking to people, and triangulating them against industry trends. Five major themes, in our opinion, will shape 2023 — Batteries, Health Tech, Manufacturing Shift, the Smart Home, and Sustainability — each with a differing impact on our coverage companies.

Figure 1. BMW’s i Vision Dee Electric Sport Sedan



Source: CES

Figure 2. Richteck Robotics’ ADAM Barista Robot



Source: Forbes

II. CES 2023 – Back to Normal-ish

CES 2023 marked the first “real” year the show was back in full swing post-pandemic. While CES had a physical presence in 2022, many companies and media canceled their trips at the last minute as the Omicron variant of COVID-19 surged. The Consumer Technology Association (CTA), which puts on CES, estimated that the 2023 show would have 100K+ attendees and 3K exhibitors — more than double the 2022 attendance, but still around 70K attendees shy of the last pre-pandemic CES in 2020. CES comes on the heels of a challenging year for tech, including widespread layoffs, decades-high inflation and likely

more government regulation. Nevertheless, conglomerates like Samsung and Sony showed up with impressive TVs and concept cars, while newer entrants like John Deere and Neutrogena impressed with their pitches for innovation.

III. Big Themes

Batteries: Demand for Bigger, Better, and Safer

Owing to the growing popularity of electric vehicles and portable consumer electronics, batteries were the one product category visible across the showroom floor. The battery technology that we observed was more than your average charge-your-mobile-phone battery packs, ranging from basic small power packs to sophisticated power stations that can connect to portable or rooftop solar. On the charging side, bidirectional chargers showed how manufacturers are looking to put the big electric vehicle batteries to use. For instance, Blink's EQ 200 demonstrated why vehicle-to-grid and home charging could be beneficial to end users, showing how it can support a home's power with a car battery. We also saw home power packs designed to provide an uninterrupted power supply and portable packs to allow consumers to charge up their products on the go.

Underpinning the battery tech innovation is a shift toward new, innovative metals and electrolytes, replacing the bulky and flammable liquid electrolyte found in most lithium batteries, to provide higher performance (shorter charge time and longer duration), while offering superior battery safety. For instance, Yoshino's new portable power stations fit the same amount of power into a smaller, lighter package compared to traditional lithium batteries – See Figure 3. Seeing larger power supply companies at CES displaying fully integrated solutions is a sign, in our opinion, that battery power storage for the home is about to hit the mainstream. Overall, CES showed us that battery makers are moving briskly to adopt innovative materials to improve battery performance and safety, creating a sustained demand surge for battery material manufacturers in the coming years.

Figure 3. Yoshino's Solid State Batteries



Source: Tech Crunch

Health Tech: Patient Monitoring and OTC Hearing Aids Dominate

As in prior years, Health tech took center stage at CES, with new patient monitoring products and technologies unveiled. While Withings' and Vivoo's edgy toilet sensor monitoring tech captured headlines, artificial intelligence (AI) powered devices to monitor health were omnipresent: from a home defibrillator by French start-up Lifeaz to ViraWarn, a pocket-sized breath analyzer that detects COVID-19, RSV and influenza in under 60 seconds. We observed AI deployed in unique patient monitoring products. For example, Valencell's new fingertip blood pressure sensor claims to provide accurate readings – See Figure 4. Patient monitoring even showed up in auto-related technologies. Hyundai Mobis, an arm of the South Korean automaker, displayed a leisure vehicle that can measure a passenger's heart rate. Based on what we saw at CES 2023, we expect more

home health monitoring devices to hit the market, ranging from the traditional wrist-worn trackers and smart rings to sensor-filled toilet seats and bathmats. However, patient monitoring products that have secured insurance reimbursement in advance or utilize existing DRG codes will likely see the most traction, especially if they fit into a provider's workflow.

Figure 4. Valencell's Fingertip Blood Pressure Sensor



Source: Engadget

Following the U.S. Food and Drug Administration's approval of the sale of over-the-counter hearing aids last year, many OTC hearing aids were on display at CES 2023. According to AARP, in the U.S. alone 48 million people need hearing aids; the lion's share (94%) have mild to moderate hearing loss, which is the target market for OTC hearing aids. Yet only 25% of the market has been penetrated. Not surprisingly, we witnessed many consumer-friendly hearing devices, a marked departure from the ungainly look of traditional devices — for example, Jabra Enhance Plus earbuds that double as a hearing aid. In 2023, the hearing tech market, in our opinion, should surge, as the FDA's approval of OTC devices will drive prices lower and increase the level of innovation.

Manufacturing: Moving Away from China to the Rest of the World

Fewer Chinese companies exhibited at CES 2023 than in prior years, amid geopolitical tensions that pushed foreign firms to diversify manufacturing operations. While the big, flashy exhibitors at the center of the show floor command the headlines, the Chinese manufacturers who make those flashy exhibitors' products can typically be found in smaller booths on the edge of the auditorium, showing off their manufacturing prowess and capabilities. Interestingly, 493 Chinese companies are exhibiting at CES 2023, less than half the number of three years ago (and compared to 1,000 Chinese companies in 2010). Many of China's tech giants working in cutting-edge areas like AI and semiconductors were absent from CES 2023, as they have been the last few years, owing to U.S. trade sanctions and China's zero-Covid policy. Instead, we observed a number of Korean, Japanese, Vietnamese, and Indian manufacturers in small booths offering their services. We see this as a reflection of American companies' efforts to diversify their supply chains away from China toward less risky regions.

The Smart Home: Matter Protocol Should Spur Smart Home Tech Adoption

Once again, smart home technology was prevalent at CES; however, a simpler, smarter smart home setup was a key theme at CES 2023. Prior to the conference, there was the usual flood of new device announcements from brands both big and small. But the most interesting discovery was new devices and old devices alike embracing Matter, the open-source, universal smart home protocol backed by Amazon, Apple, Google, Samsung and many others. Matter promises a single, Wi-Fi-based standard that bundles together compatibility with Alexa, Google Assistant, Siri and SmartThings, among others. At CES 2023, we saw many new gadgets rushing to join the Matter standard, including compatible smart lights and smart plugs, connected roller blinds, and others, with older gadgets promising to embrace the Matter standard in their next iteration. With the Matter

protocol in place, smart home adoption should accelerate, in our opinion, in the coming years, as consumer hesitation fades. Additionally, we foresee a new focus on consumer tech devices that double as strategically placed Wi-Fi routers to serve as the main conduit for the Matter-centric smart home.

Sustainability: Companies Are Finally Paying Attention

Sustainability was another major theme that prevailed across the CES show floor. Practically every company we met at CES talked about how its products would be more sustainable. For example, Samsung discussed its partnership with Patagonia to reduce microplastics in the water supply. Apparently, one of the CTA's key priorities this year was calling attention to the social and environmental impact on tech, and companies ran with that theme. For instance, John Deere displayed a new robot planter designed to reduce fertilizer and chemical use. The fact that companies are starting to take sustainability more seriously is an indication to us that consumers are starting to care.

IV. Gunnar Coverage Universe Impact

The CES 2023 observed trends affect the following coverage companies:

HeartBeam (NAS: BEAT) – Buy Rate, \$9 PT

- BEAT's portable, credit-card-sized heart attack detection device should benefit from the new interest in patient monitoring products and technologies. Unlike the exotic and flashy diagnostic tech exhibited, BEAT's practical, portable tech should garner provider interest, owing to its inclusion in the patient flow and existing DRG reimbursement codes.

SKYX Platforms (NAS: SKYX) – Buy Rated, \$8 PT

- SKYX displayed its SkyPlug technology in the smart home section of CES 2023, generating significant buzz from its CES 2023 Innovation Award in the Smart Home category. The adoption of the Matter protocol by smart home vendors should serve as a catalyst to encourage more consumer adoption of the technology. With its strategically located ceiling plug, SKYX could emerge as the Wi-Fi nexus hub for the smart home.

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For HeartBeam, Inc. and SKYX Platforms Corp., we use the Russell 2000 as the relevant index.

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