

# ESTABLISHING THE INDIAN DISPLAY MARKET WITH MICRO-LEDS



**A Session on 'Micro-LEDs: Future of Displays' By Panellists - Abdul Waheed, Managing Director, EYTE Technologies Pvt Ltd (CTS-I), Gangasagar Amula, Director, Absen India, Mr. Su Piow Ko, CEO, AET Displays Limited, Vineet Mahajan, Director, Unilumin India, and Sanket Rambhia, Director, Xtreme Media Pvt. Ltd.**

According to the reports, "true MicroLED display market for pro AV is set to skyrocket and accelerate from just \$24.0 million in 2023, to reach annual revenues of \$26.2 billion in 2032". AV-ICN Conference Programme 2024 marked its beginning at AV-ICN Expo with the panel discussion on 'Micro-LEDs: Future of Displays', attempting to define micro-LEDs and the current and future challenges in the display industry. This feature shares the session in brief and attempts to answer questions like – Is there significant interest in MicroLEDs from the giants of LCD panel manufacturers and are they motivated to leverage their expertise, will MicroLED drive down manufacturing costs and build a bridge to widespread adoption, what is MicroOLED and MicroLED - The Future of AR/VR Displays, what are the current and future challenges to adoption, will MicroLED be impacted by thin film technology?

## Micro-LEDs: Defining the technological trend

There have been broad disagreements about the proper definition of MicroLED. As per the reports, it has been largely agreed now, that a true MicroLED will be implemented as sub-100-micron chiplets, mass transferred onto a TFT backplane with active driver technology. **Abdul Waheed**, Managing Director, EYTE Technologies Pvt Ltd (CTS-I), kicks off the panel discussion by posing the question - what are Micro-LEDs and how is it changing the technology trend in video displays?

**Gangasagar Amula**, Director, Absen India, responding to the question, states, "The trend is going to be much more refined LEDs coming up in the future. We are talking about SMD, mini-LEDs, micro-LEDs, then things that will go on with variables having active LEDs on watches, and more. This is just the beginning." He adds, "Active

LED is nothing but a concept where we have LEDs directly lighting up the colours compared to the LCDs with conventional type of technologies. Active LEDs are changing the entire game and so, users can make any canvas, design, or curves with active LEDs."

## Evolution of LEDs and the Indian display market

Adding to Gangasagar's thoughtful words and continuing the discussion on LEDs, **Sanket Rambhia**, Director, Xtreme Media throws light on how this field emerged from those days. He states, "As Mr. Waheed said at the beginning of the discussion, we've all seen activities from around 20-30 years back, but we didn't recognize them as active LED displays and that time active LEDs were basically in the form of single colour, tickers, or indicator panels. So, our parent company, Energy Control started manufacturing active LEDs

in India since 1990 with railways, Bombay Stock Exchange, etc. amongst the few primary clients to exchange information. So, it started getting used as a primary source for distributing information primarily in outdoor medium." He adds, "There's a change of pace because obviously the technologies in the market and the affordability of the products have made it possible."

India is an emerging market in the world not only for active LEDs but for many other things as well. Keeping the transforming world in mind, the session's moderator, **Abdul Waheed** raises another question for **Vineet Mahajan**, Director, Unilumin India – "We see a lot of companies coming to India, so how does the Indian market look like and how is it growing?"

**Vineet Mahajan** responds by saying, "The beauty of this industry lies in the kind of versatility and you're right this industry is moving at a very fast pace. There are very few businesses, which are growing in double digits and active LEDs is one of them. So, if I give you the numbers – globally the market is \$13 billion with the ratio of 70% indoor and 30% outdoor and it is growing at a CAGR of 18% while India is hardly contributing less than 1% of the total global market i.e. around \$100 bil-

lion. Therefore, the potential of the Indian market is still to be tapped. Furthermore, India's growth rate is 28%, which means in the next three years, Indian market can see the change from \$13 billion to \$20 billion globally." He adds, "What is fuelling the change? I think the most valid reason is the falling prices of active LEDs. Now because active LEDs are reaching the economy of scale, we see prices tumbling down by 3 to 5%. Second reason can be the limitations of other technologies like LCDs."

Keen on discussing more about the Indian display market, **Waheed** asks **Mr. Su Piow Ko**, CEO, AET Displays, about his journey in this industry, especially in India to which **Mr. Ko** replies, "I think India is one of the fastest growing display markets in the world because of the expenditure on the infrastructures. For the next 5-10 years, railway stations, airports, subways, or all the government infrastructures can see the massive investment into display. Therefore, our vision to bring technology to India is because of our confidence in the expanding market of India. Recruiting and training people is one of the areas India can improve with the technical people on the substance of LED display or active LEDs and that's what we are committed

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UNILUMIN INDIA**

to do. We have roughly around 40 people amongst which around 20 people are technical specialists that are sent overseas for training to understand the key principles

of active LEDs like chip manufacturing or display assembling, etc.”

Continuing the discussion further about the LEDs in the Indian market, Waheed inquires Sanket Rambhia, “How much are the Indian key players like distributors or OEMs prepared to grab the opportunity of entering the global market and what are the challenges?” Rambhia responds, “There are two segments in the Indian market – The organized segment and the unorganized segment. Both are growing very rapidly. As one of the leaders or pioneers of the Indian display industry, it’s our job to navigate the industry in the right format because unorganized means more non-standardized products, ending up with bad customer experiences. The most important challenge I face is to educate the customer to make the right decision, keeping in mind the quality, service, and price.”

## Exploring indoor and outdoor LEDs

Dividing the demands to indoor and outdoor as brought up at the beginning of the session, Waheed further interrogates, “What are these applications or areas we can look at where these active LEDs can go?” With interesting insights on the topic, Gangasagar Amula replies, stating, “We can divide active LEDs into five segments – Pro AV segment, rental segment, retail segment, outdoor segment, and virtual production. Every segment has a different set of challenges and people in the industry are working hard on those aspects, trying to deliver optimum results in front of the customers.” The panellist continued to talk about the applications of LEDs further, explaining every aspect of active LEDs in detail to the audience.

Further interrogating on the live experiences of the panellists, Waheed enquires to Vineet Mahajan about what areas are being covered by the customers at the exhibitions like AV-ICN since there’s a demonstration of rental businesses catering to LEDs, LCDs, and even OLEDs, and how does he see the market evolving. Presenting his thoughts on the reviewed topic, Vineet states, “As Mr. Ko said that the biggest challenge with LCD manufacturers is the size and we need to have a seamless display, which only LEDs can offer. This is the only reason that the LCD manufacturers are shifting from LCDs towards LEDs. In fact, LCD production has been stopped 15 months back in India because of the transition from LCD video walls to LED

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video walls. Not only are the LED displays providing a pixel pitch of 0.6 mm, 0.4 mm, and 0.5 mm with the better resolution, but are also bringing more versatility in the form of curved displays, aspect ratios, and better sizes.”

Another question proposed by Waheed to Gangasagar during the session brought out a very fascinating fact on outdoor LED displays. He asked about the key elements that should be looked at while going for outdoor displays, to which Gangasagar responded, “We installed the first outdoor LEDs in 2009 in India and that time we were talking about P16. Today, we are talking about P4 or P2.5. As an OEM, I feel that there is too much of saturation happening on the streets and even the advertisers are facing the challenges of using it. Therefore, we always suggest our partners to use warm lights while installing outdoor LEDs. We also inform users about the power saving factor because the screens are big and consume a lot of power, especially with the huge power fluctuating problem in India.”

## LEDs power consumption: Exploring the technical possibilities

For indoor LED displays that are installed in boardrooms, auditoriums, etc., heat generation is a major challenge. Waheed questions, “how are we addressing this challenge?” Mr. Ko responds by saying, “As a manufacturer, I think there are many ways by which we can overcome this challenge, starting from the efficiency of

the chips because that’s where the heat is coming from. Basically, there are two levels. One is the efficiency of the chip because everybody is trying to minimize or optimize specific areas. We have to look into the little details of the products. For instance, checking the first portion, which would be the chips, then the next portion, which is the driver level or the common cathode driver. Common cathode driver compared to common anode driver will be saving nearly 20 to 30% in terms of power consumption. Furthermore, the thickness of the PCB is also very important to keep the heat in check.” Leading the conversation ahead, Mr. Ko along with other panellists, further explored many other intricate technical possibilities that can help manage heat generation in indoor LEDs.

Exploring about the technologies, Waheed continues to ask questions like what are the key elements that active LEDs have as a technology that other video displays, LCDs, cubes, or video walls cannot fill, what other developments are taking place in terms of pixel pitch, color brightness, other applications, etc., what is the role of AI, what are the major challenges that arise while selecting any product or brand for active LEDs, key factors to count while designing outdoor signages, what kind of training needs to be imparted to ensure safety during installations, how active LEDs are replacing older technologies and what are the additional features that active LEDs are offering, and many more.

## Conclusion

Concluding the discussion with wonderful insights and persuasive thoughts, panellists opened the floor for Q&A with the audience about micro-LEDs and the future of displays. Making the session more interactive and informative, audience came up with some questions like – what the OEMs are doing for the products to fit the Indian market, how to eliminate the structures, and more.

LED is a huge market in India and with common understanding, customisation, and standardisation, brands or OEMs are able to define different AV standards around the country considering Indian environment and conditions. The session ended with a fruitful discussion on the future of LED displays with panellists sharing their experiences about the technologies and responding to the curious minds about the coming up technical innovations.