# TCL and Samsung showcase next-gen display tech but consumer adoption remains years away



The competition in the world of display technology has reached an intriguing juncture, as both TCL and Samsung unveil advances that could redefine our viewing experiences. As two frontrunners in the display industry, their recent developments in inkjet-printed OLEDs and quantum dot technologies present potential successors to current OLED screens, though the reality of these innovations gracing living rooms anytime soon is, unfortunately, distant.

TCL's display-making subsidiary, CSOT, has showcased its inkjet-printed OLED technology, signalling significant strides in the production of these panels, now available in sizes up to 65 inches. This technology promises not only more environmentally friendly production processes but also the capability to be applied across a spectrum of devices, from televisions to smartphones. By utilising precision inkjet printers, TCL has reportedly reduced internal light loss by 50%, leading to a 1.5-fold increase in light output efficiency. Such efficiencies suggest brighter displays with enhanced colour vibrancy, as well as a 50% reduction in blue light emissions, important factors for energy-conscious consumers.

TCL has announced plans to enter small-scale production with 21.6-inch 4K OLED panels by the end of 2024, targeting use in medical monitors, with aspirations for larger consumer-oriented panels in the near future. However, while this progress is commendable, experts caution that it could take several years before inkjet-printed OLEDs become affordable for the average consumer. The cost of new technologies often remains prohibitive until mass production drives prices down, which is a sentiment echoed by TCL itself.

Conversely, Samsung Display's innovative venture into quantum dot electroluminescence (EL-QD) is garnering attention for its promise of enhanced colour gamuts and lower power consumption. Excitingly, recent developments have reportedly tackled EL-QD's longevity issues, which had previously hampered its commercial viability. The new prototypes, now devoid of cadmium—a substance constrained under various international regulations—exhibit improved lifespans. Nevertheless, Samsung's latest EL-QD prototype, measuring just 18.2 inches, struggles with brightness levels that do not yet compete with existing OLED technology, reaching a mere 400 nits compared to the over 1,000 nits of leading OLEDs.

As exciting as these advancements are, neither technology is ready to replace OLEDs in homes just yet. Experts agree that although both TCL and Samsung are paving the way for a future where display technologies could surpass what is available today, significant hurdles remain before mass production becomes a reality.

Furthermore, the broader landscape of competing technologies continues to evolve. Emerging alternatives like Quantum Dot Electroluminescent (QDEL) TVs and Phosphorescent Organic Light-Emitting Diodes (PHOLEDs) offer their own enticing features. The QDEL technology, for instance, promises remarkable energy efficiency and long lifespans, positioning it as a contender in the shift away from OLEDs.

However, Samsung and TCL's efforts to innovate show that the pursuit of better display technology is a multi-faceted race. While both companies have achieved important milestones, the timeline for seeing such advances in the average consumer's home remains uncertain. As they continue to refine their technologies, potential customers are advised not to delay their television purchases and to remain patient for the next big breakthrough that could change the way we view content.

As the display technology landscape unfolds, it is evident that innovation is currently abuzz, setting the stage for an exciting future. Yet, for now, the major players continue to navigate the complexities of production, cost and consumer readiness before truly revolutionising our viewing experiences.

#### Reference Map

1. Paragraph 1: Sources 1, 3, 4
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Source: [Noah Wire Services](https://www.noahwire.com)

## Bibliography

1. <https://www.techradar.com/televisions/tcl-and-samsung-reveal-big-updates-to-two-oled-beating-technologies-but-dont-get-excited-for-them-in-tvs-yet> - Please view link - unable to able to access data
2. <https://www.tclcsot.com/en/news/2024/20241116.html> - TCL CSOT announced the mass production of its Inkjet Printing OLED (IJP OLED) technology at the 2024 Global Display Tech-ecosystem Conference. This advancement follows 11 years of research, resulting in significant improvements in image quality, power efficiency, and lifespan. The company has secured numerous patents in the IJP OLED field, covering applications in notebooks, monitors, and televisions. The first mass-produced 21.6-inch 4K IJP OLED product has entered production, marking a new era in display technology commercialization.
3. <https://www.tomshardware.com/tech-industry/tcl-boasts-about-the-image-quality-power-consumption-and-lifespan-benefits-of-its-latest-inkjet-printed-oled-displays> - TCL's inkjet-printed OLED displays utilize precision inkjet printers to deposit OLED materials directly onto substrates, enhancing material efficiency and reducing production costs. This method has led to a 50% reduction in internal light loss and a 1.5-fold increase in light output efficiency. The technology also boasts a 50% decrease in blue light emissions, contributing to improved brightness and color vibrancy. TCL plans to initiate small-scale production of 21.6-inch 4K OLED panels for medical monitors by the end of 2024, with expansion into medium-sized panels for IT devices in 2025.
4. <https://www.tomsguide.com/tvs/these-3-tv-technologies-are-vying-to-replace-oleds-in-the-next-decade> - The article discusses three emerging TV technologies that could potentially replace OLEDs in the next decade: Quantum Dot Electroluminescent TVs (QDEL or Nano-LED TVs), Phosphorescent Organic Light-Emitting Diodes (PHOLEDs), and Inkjet Printed Displays (IJP OLEDs). QDEL TVs, utilizing self-emissive quantum dots without a backlight, promise improved power efficiency, longer lifespans, and robust color accuracy. Samsung and TCL are actively developing QDEL displays, with prototypes already showcased. PHOLEDs, specifically Blue PHOLEDs, offer better energy efficiency and reduced heat compared to current OLEDs by using phosphorescent blue subpixels. Universal Display Corporation is targeting a market launch around 2026. Inkjet Printed Displays by TCL aim to lower production costs and enhance efficiency, with initial high-end 8K display applications and potential future consumer availability. Although QDEL TVs appear most promising, mass production and consumer adoption of these technologies are expected to take several more years.
5. <https://www.notebookcheck.net/TCL-makes-OLED-more-affordable-and-brighter-with-new-inkjet-printing-technology.908674.0.html> - TCL's inkjet-printed OLED technology has achieved significant strides in efficiency and cost reduction. By employing precision inkjet printers, TCL has managed to cut internal light loss by 50% and boost light output efficiency by about 1.5 times. This method also enhances material efficiency, achieving up to 90% material usage, and reduces blue light emissions by 50%. The company plans to start small-scale production towards the end of 2024, beginning with 21.6-inch 4K OLED panels for medical monitors, with expansion into medium-sized OLED panels for computing devices in 2025.
6. <https://www.prnewswire.com/news-releases/tcl-csot-showcases-latest-display-technologies-at-ces-2023-301715378.html> - At CES 2023, TCL CSOT unveiled its flagship 65-inch 8K Inkjet Printing OLED (IJP OLED) display, marking the world's first 65-inch 8K printing OLED. This display boasts up to 33 million ultra-high pixels, delivering exceptional image quality with the highest resolution and refresh rate. Developed in collaboration with JOLED, the display features an improved refresh rate, higher brightness, and a narrower border compared to previous models, incorporating advanced technologies such as IR-Drop and thin-film transistor (TFT) compensation.
7. <https://www.prnewswire.com/news-releases/tcl-csots-worlds-first-14-2-8k-inkjet-printing-hybrid-oled-display-wins-awe-award-302092639.html> - At AWE2024, TCL CSOT showcased the world's first 14-inch 2.8K Inkjet Printing Hybrid OLED Display, which received the AWE Award for its outstanding, revolutionary OLED technology. The display, a groundbreaking application of IJP OLED technology in laptops, boasts a breakthrough 240 PPI in mass production and utilizes a new type of Oxide compensation circuit technology for IGZO inkjet-printed OLED in various forms. With 30-120Hz VRR technology for adaptive power optimization, it offers a stunning visual experience with its 2.8K high-resolution. The display is thin, portable, and empowered by Hybrid OLED technology, enhancing convenience for mobile users.