



Smartkem

OUR TRANSISTORS YOUR ADVANTAGE

Cautionary Note Regarding Forward Looking Statements

This presentation contains certain forward-looking statements within the meaning of Section 27A of the Securities Act of 1933 and Section 21E of the Securities Exchange Act of 1934 and Private Securities Litigation Reform Act, as amended, including those relating to the Company's product development, market opportunity, competitive position, possible or assumed future results of operations, business strategies, potential growth opportunities and other statements that are predictive in nature. These forward-looking statements are based on current expectations, estimates, forecasts and projections about the industry and markets in which we operate and management's current beliefs and assumptions.

These statements may be identified by the use of forward-looking expressions, including, but not limited to, "expect," "anticipate," "believe," "estimate," "potential," "predict," "project," "should," "would," and similar expressions and the negatives of those terms. These statements relate to future events or our financial performance and involve known and unknown risks, uncertainties, and other factors which may cause actual results, performance or achievements to be materially different from any future results, performance or achievements expressed or implied by the forward-looking statements. Such factors include those set forth in the Company's filings with the Securities and Exchange Commission. Prospective investors are cautioned not to place undue reliance on such forward-looking statements, which speak only as of the date of this presentation. The Company undertakes no obligation to publicly update any forward-looking statement, whether as a result of new information, future events or otherwise.



Reshaping the World of Electronics | OTCQB: SMTK

Disruptive TRUFLEX® Technology

A revolutionary semiconductor platform for Organic Thin Film Transistors (OTFTs).

TRUFLEX® is a full transistor stack design and process platform that produces transistors that are flexible, bendable, wearable, and lightweight.

Materials are solution deposited on low-cost plastic and glass at a **low temperature (80°C)** to make transistor circuits with performance significantly beyond amorphous Silicon (aSi).

TRUFLEX® materials are compatible with existing industry standard manufacturing infrastructure and next generation printing processes.

Monolithic display for AR & VR headsets.

The platform can be used in several applications including AMOLED displays, Quantum Dot displays, mini / microLED displays, and integrated logic circuits.

World Class Technology Team

48 full time employees with 200+ combined years industrial and R&D pedigree at ICI, Merck, Philips, Kodak, CDT, Motorola.

Extensive, Broad and Defendable IP Portfolio

>175 patents across 17 patent families – 125 granted and ~50 pending

40 codified trade secrets

Collaborations

Enabling customers to make new and innovative products

2021 - JDA with RiTdisplay for the production of a full color demonstration AMOLED display.

2022 - JDA with Nanosys for new generation solution printed microLED and quantum dot materials for advanced displays.

2022 - Additional JDA for the development of a new generation of miniLEDs signage

Design & Prototyping Capability

Material supply scaled up at toll manufacturers.

EDA design tools available to enable customers to synthesize circuits.

Prototyping available on 4in, 8in, 12in and Gen 2 processes.

Monolithic display for AR & VR headsets.





Investor Confidence

Funding History

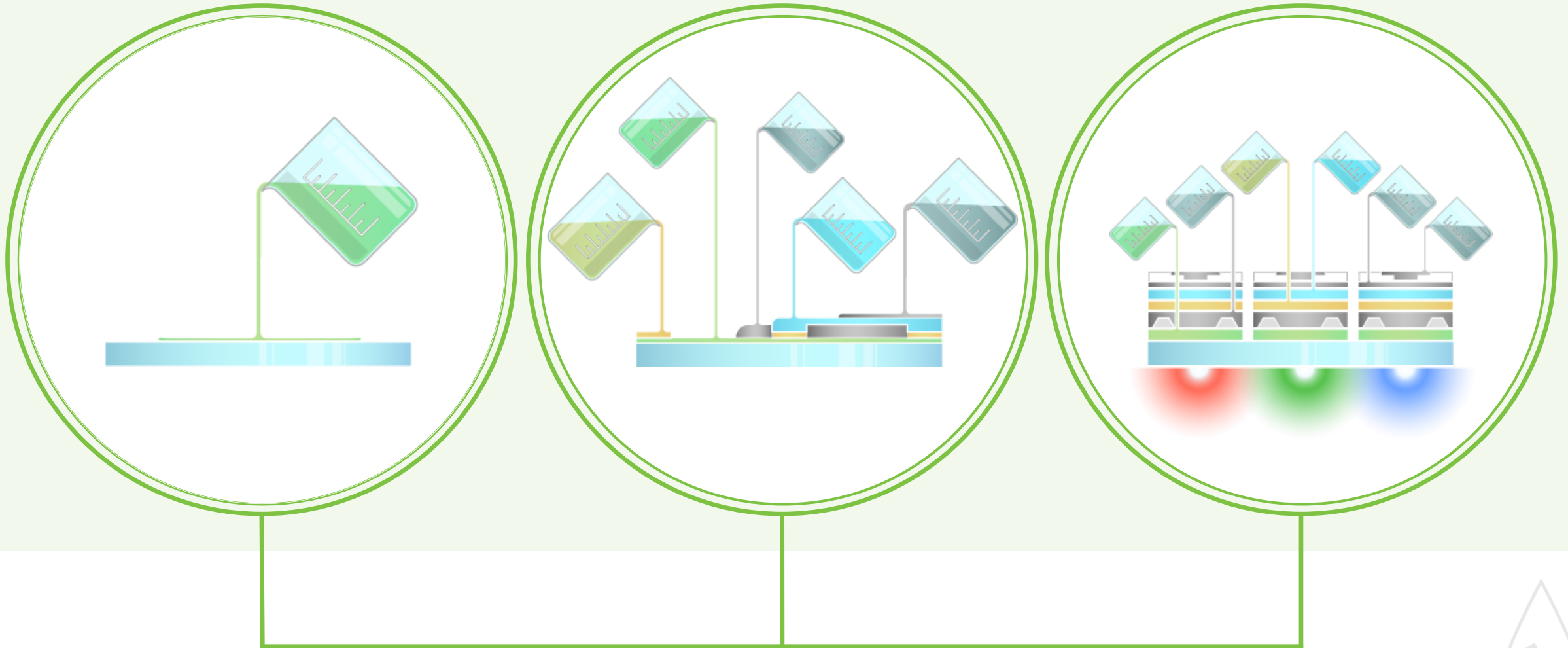
In February 2021, SmartKem raised \$24.6 million in gross proceeds through a private placement of common stock-only at \$2.00 per share.

To date, over \$60 million has been invested in SmartKem.

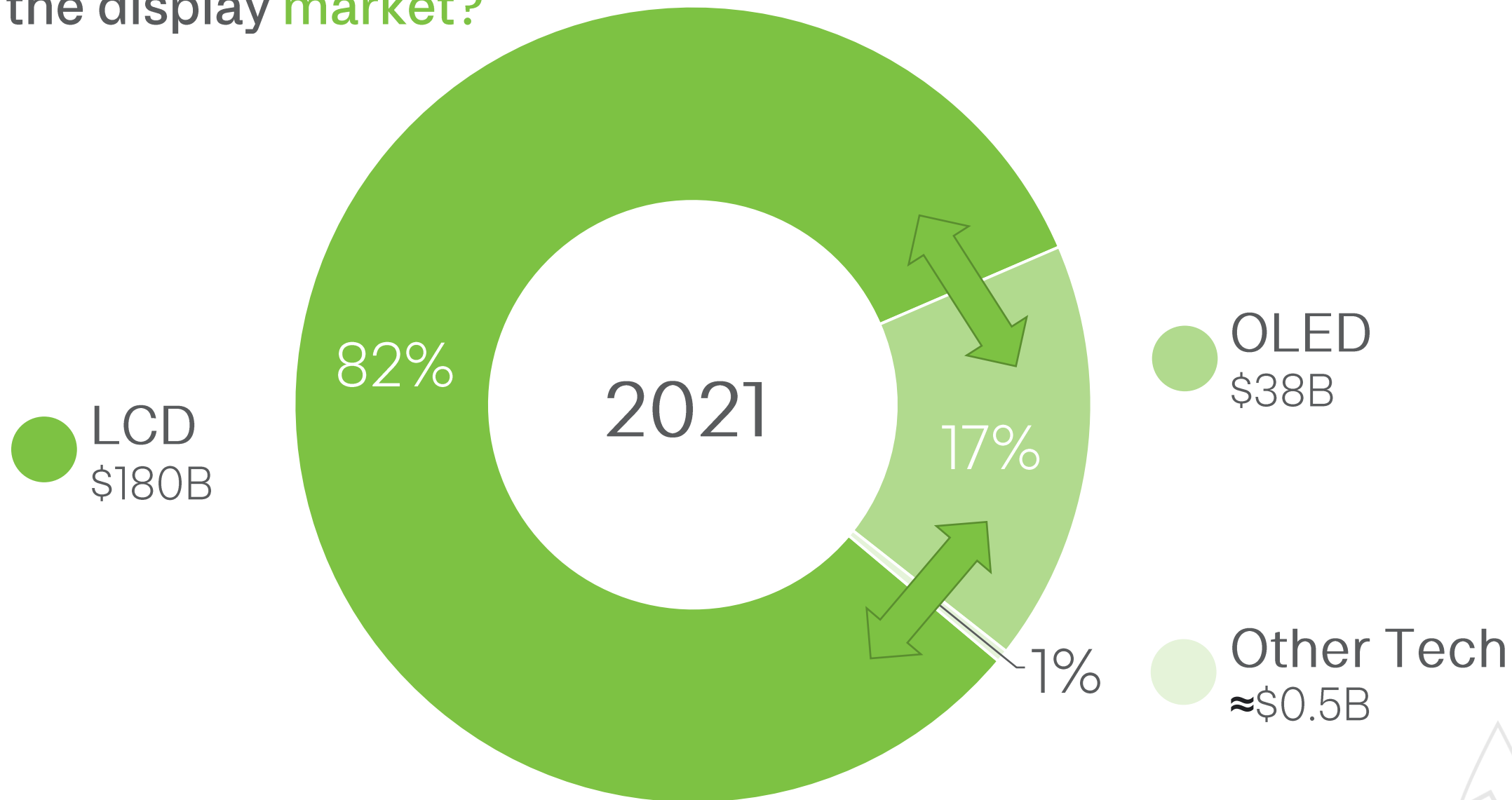
Institutional investors include AIGH, Octopus Ventures, Entrepreneurs Fund LP, and BASF Ventures.



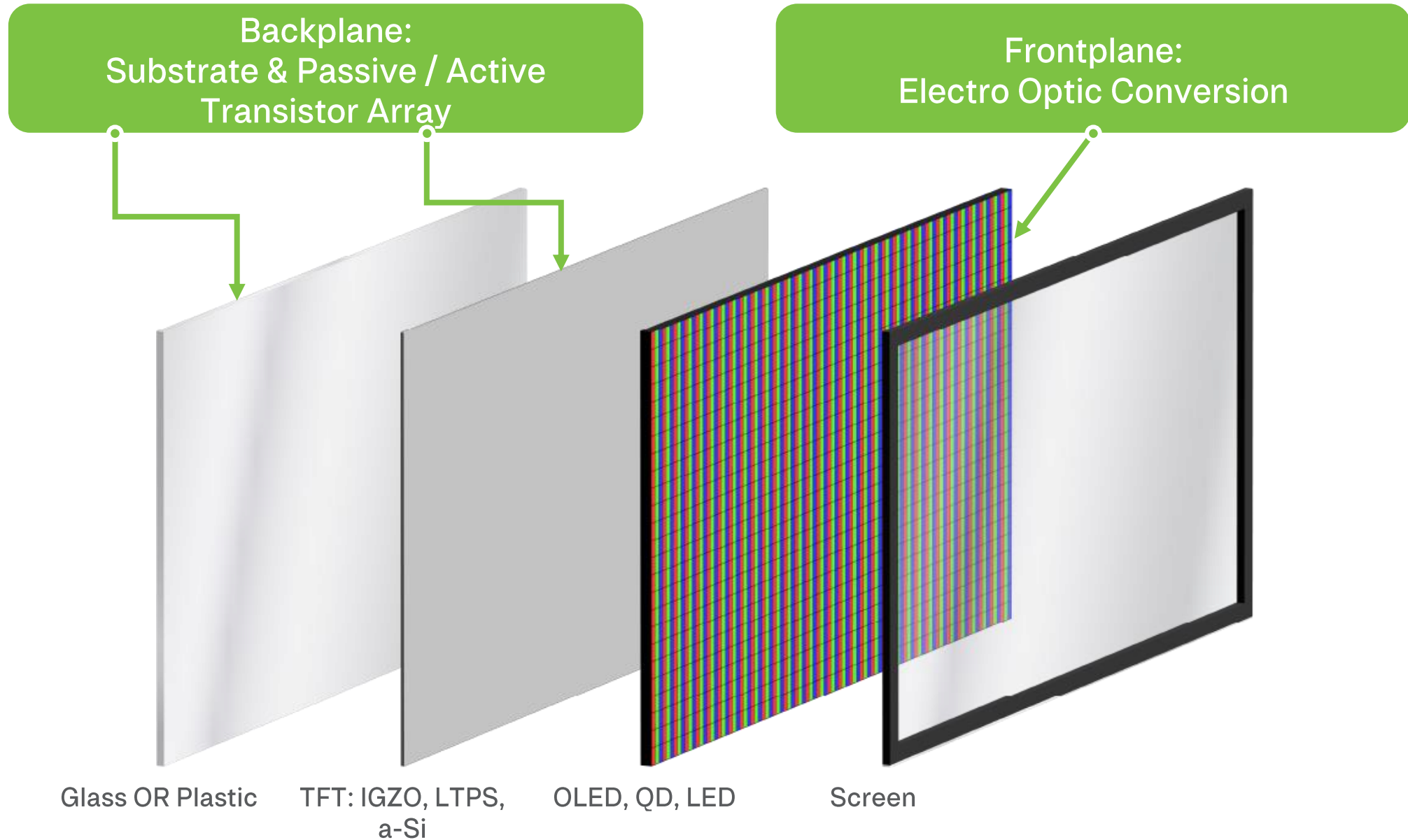
We manufacture “TRUFLEX[®] inks” that are used to make transistors



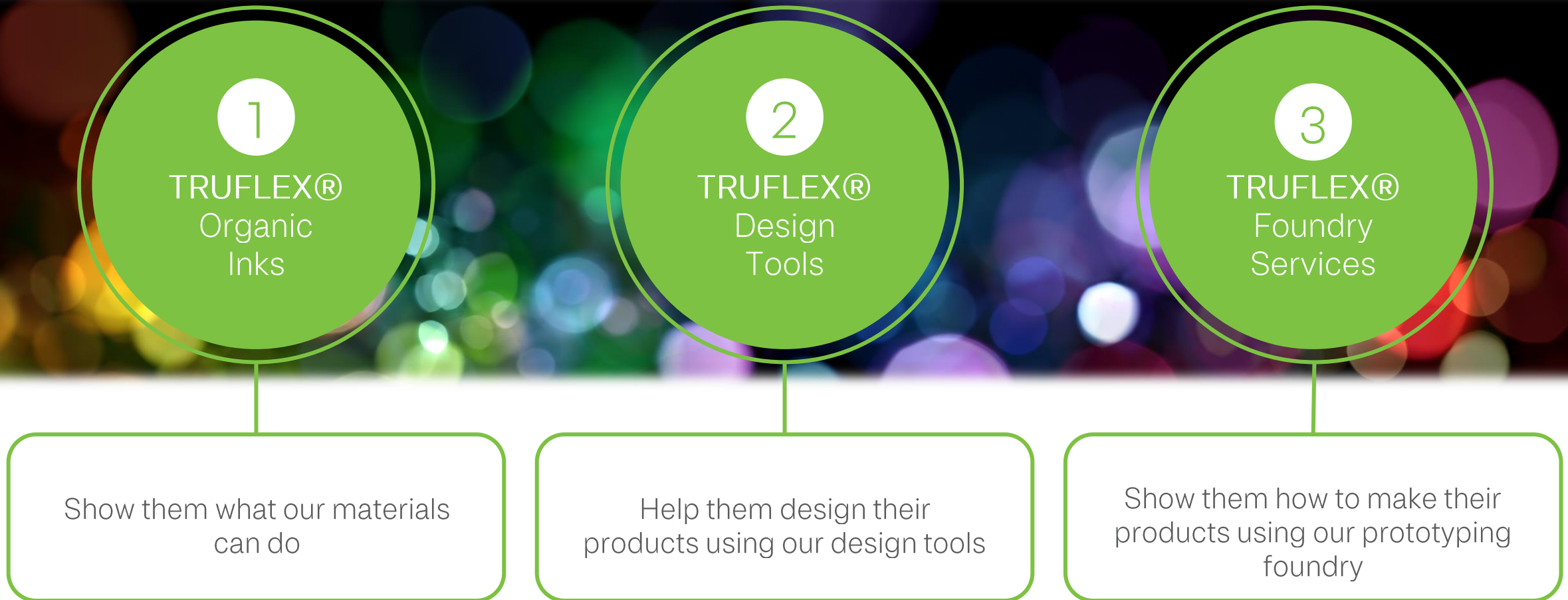
Why the display market?



Components of a display **two things in common**



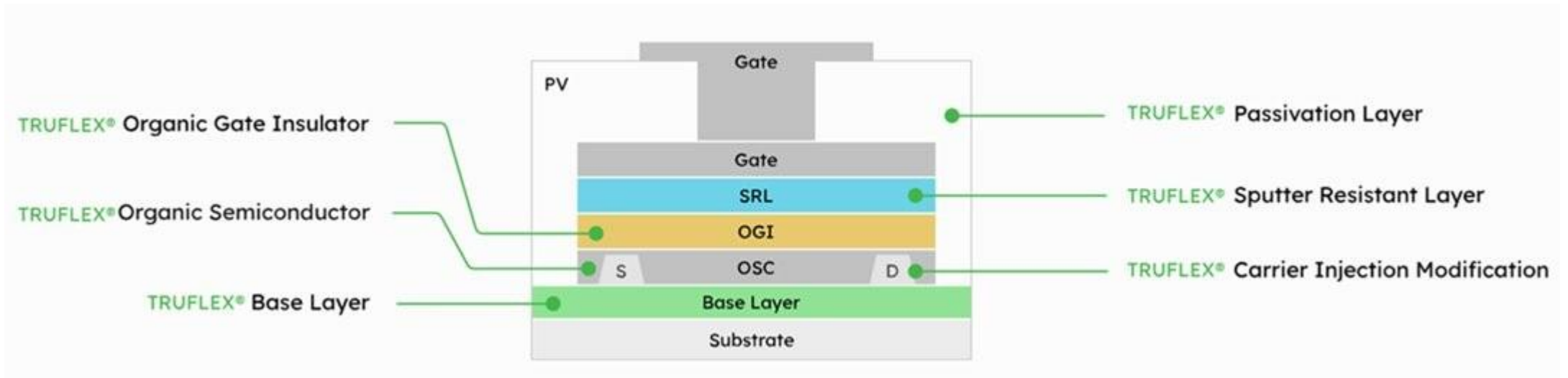
Market Entry Strategy - Enable customers to make the “impossible”



Sell materials, licence processes and fields of use



1. SmartKem's TRUFLEX® Materials



Ease of Material Supply

Core chemistry can be manufactured using Toll manufacturers

Solution processed At 80C

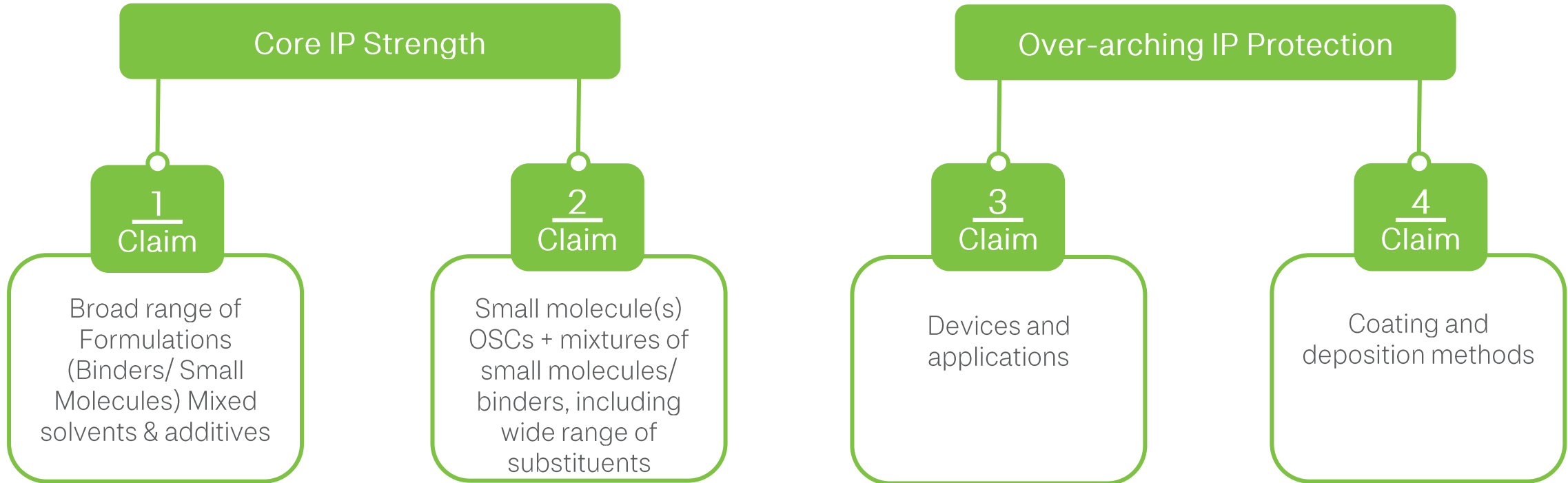
Formed on low-cost glass & plastic, processed using direct laser writing

Drop in technology for today's fab lines

Processed on existing A-Si lines, without CVD machines



Materials: Outstanding IP and Know-How

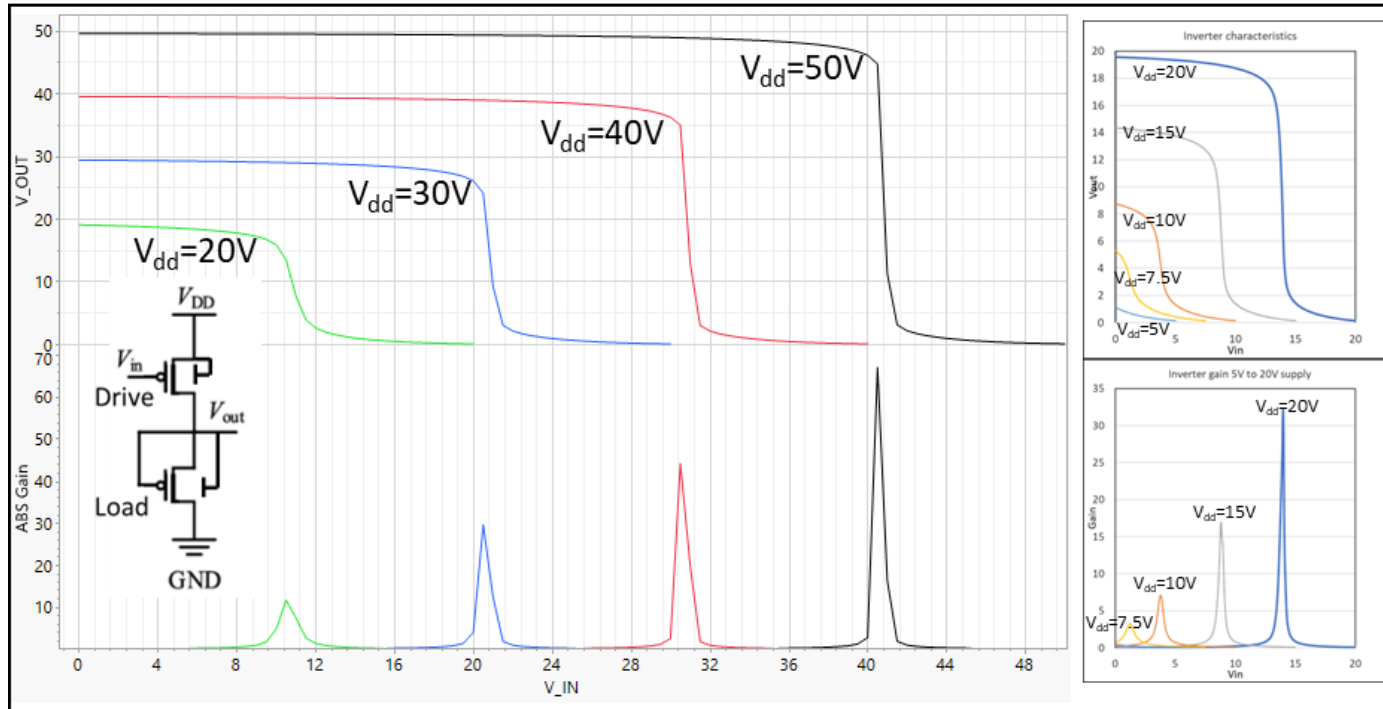


- >175 patents across 17 patent families – 125 granted and ~50 pending
- 40 codified company trade secrets files and increasing...
- Strong Freedom To Operate position and no 3rd party licenses required



2. Electronic Design Tools

SmartKem is granting licence free access to its design tools to seed the market.



Cadence

Cadence scripting complete for single gate OTFT, circuits can be designed within the Cadence EDA system

Dual gate OTFT logic capable of operating at voltages $< 7.5V$ with high noise margin and gain



3. TRUFLEX® Foundry Services

Prototyping Sales & JDAs



Digital Lithography

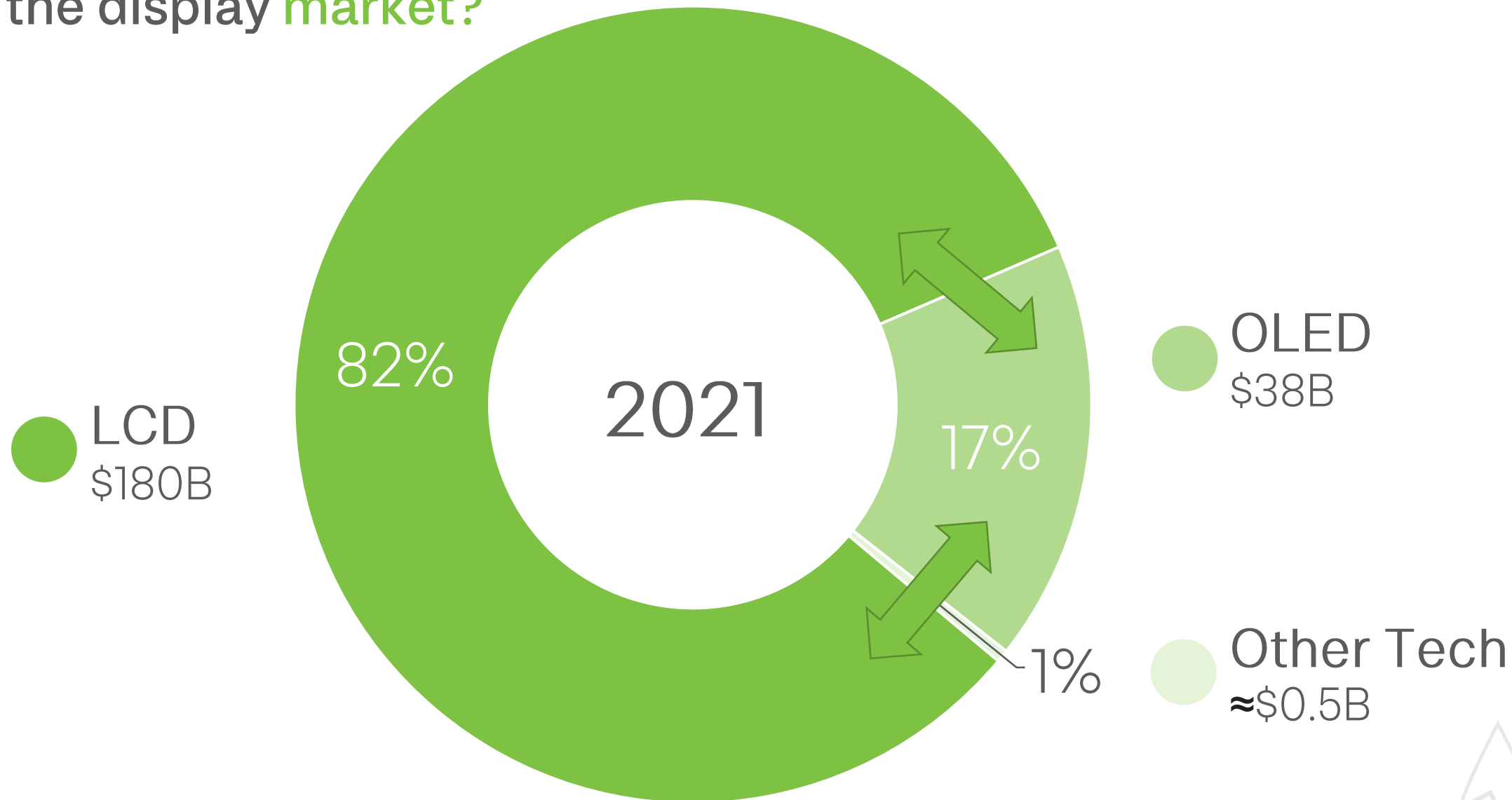
Access to tool set at Centre for Process Engineering (CPI) in North-East of UK

4in, 8in, 12in and Gen2 capability.

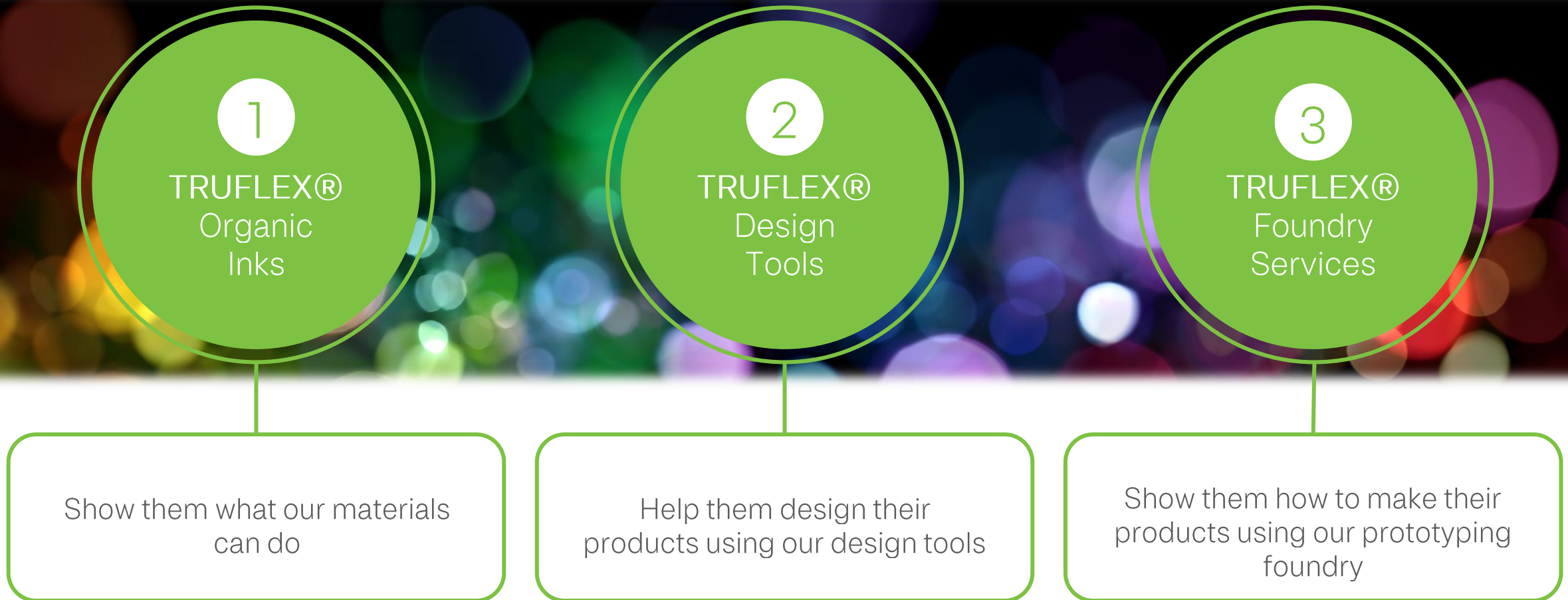
Using digital lithography for full-custom circuits – sheet to sheet initially and then roll-to-roll in the future.



Why the display market?



Market Entry Strategy - Enable customers to make the “impossible”

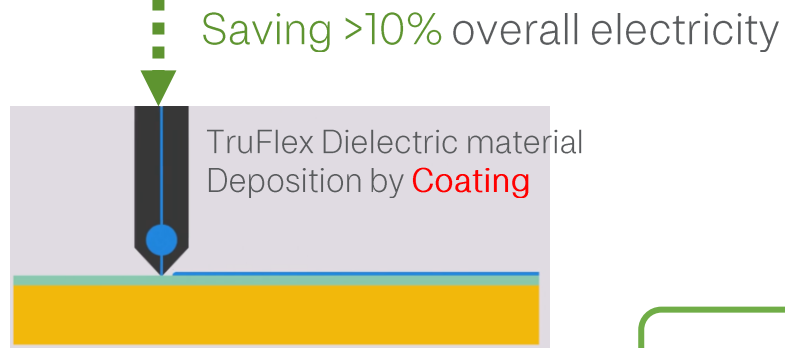


Sell materials, licence processes and fields of use



LCD : Eco-Friendly Silicon Nitride Replacement

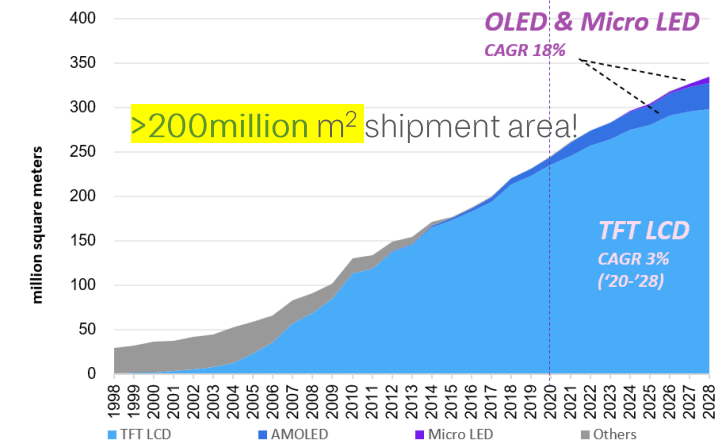
Conventional TFT-LCD implemented lots of PECVD to build TFT backplane structure



Dry etching gas for SixNy
 SF_6 : 22.8k factor than CO_2
 NF_3 : 17.2k factor than CO_2
 O_2 : 0 factor than CO_2
 No global warming gas

In trials with 3 customers
 TAM c\$100m

Display shipment area forecast by technology



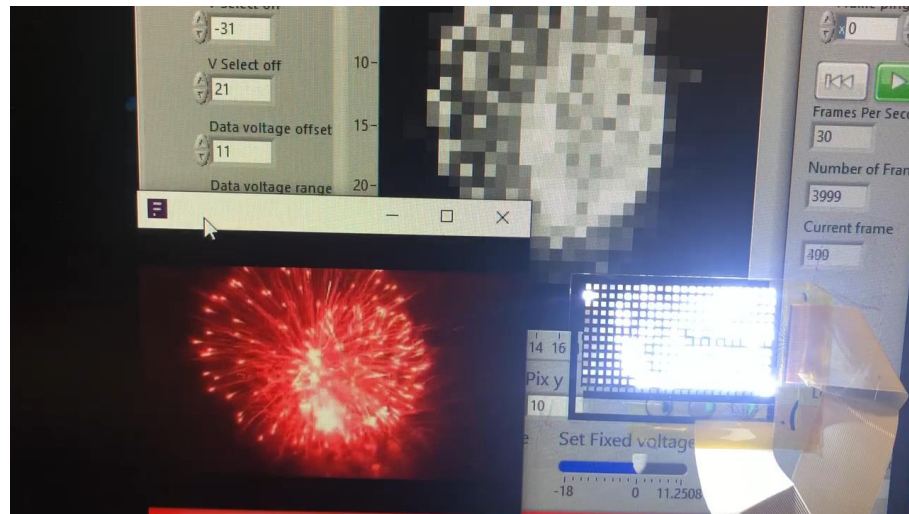
Source: Omdia

© 2021 Omdia

LCD : Full area local dimming for higher performance



LOCAL DIMMING TYPES				
	OK / Good	Good	Better	Best
LCD Panel				
LED Backlight				
	<u>No Local Dimming</u> All LEDs always on Only pixels open/close -tens standard LEDs	<u>Edge-lit Local Dimming</u> Vertical strips of LEDs on/off -10 zones -tens standard LEDs	<u>Standard Local Dimming</u> Zones of LEDs on/off -100 zones -hundreds standard LEDs	<u>Mini-LED Local Dimming</u> Zones of LEDs on/off -1000 zones -tens of thousands of mini-LEDs



Smartlight LCD prototype
for Q1 2023, targeted at VR headsets
TAM \$300M



OLED, Joint Development Agreement: RiTdisplay

Based in Taiwan RiTdisplay is a leading developer of optoelectronic solutions, visual displays and passive matrix OLED displays. This collaboration seeks to produce a full colour demonstration AMOLED display.

TRUFLEX[®]
OTFTs

Moving from passive matrix
to active matrix colour OLED
on low cost lines

 RITEK GROUP
RiTdisplay Corporation
AMOLEDs





METAVERSE

- Today, there is no display solution available (large or small), with good enough performance, at a low enough cost, to enable the ubiquitous adoption of enhanced reality (Metaverse)
- The market is open for change



Mini/MicroLED Display Benefits

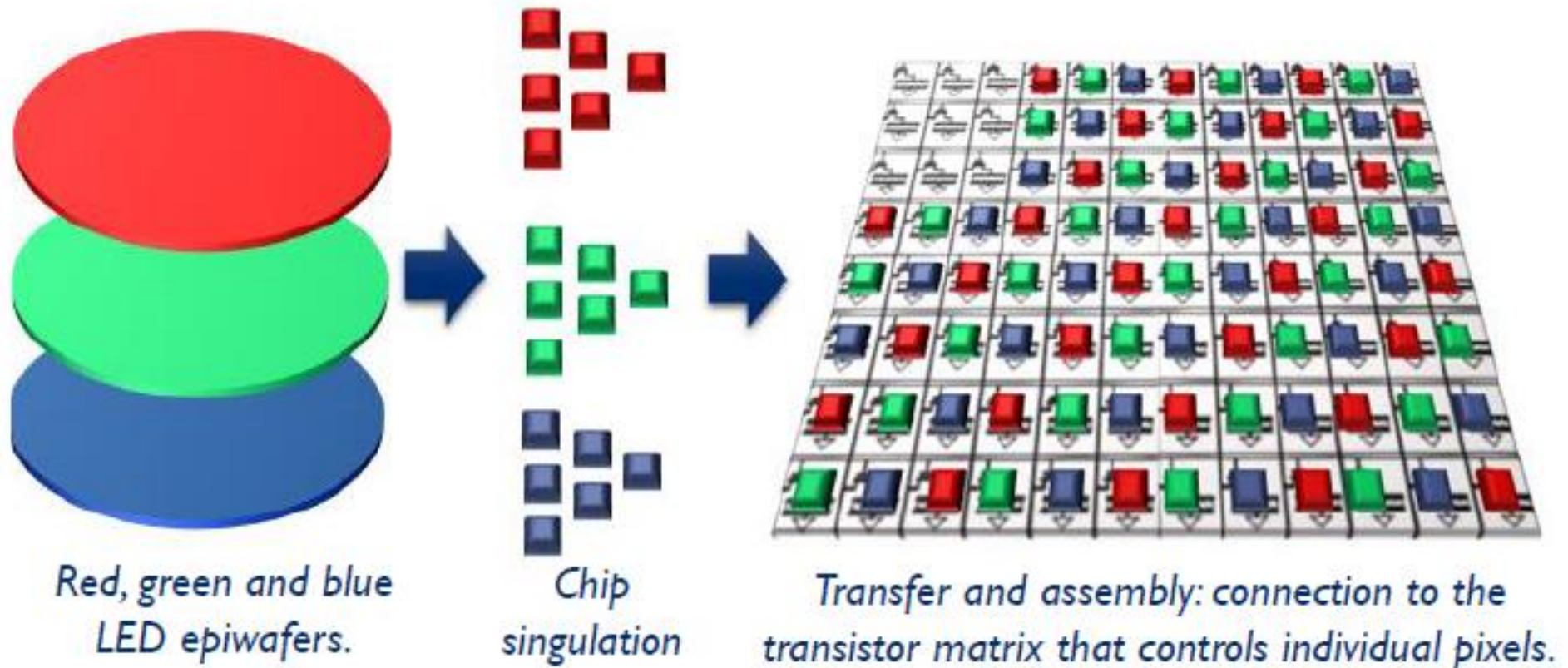
Display	LCD	OLED	μ-LED
Efficient light source	Yes	No	Yes
Self-emissive	No	Yes	Yes
Brightness [nits]	3K	1K	>100K
Power saving vs LCD	N/A	30%–40%	90%
Operating lifetime [years] (continuous on use)	7	2.5-3.5	9-11
Sunlight readability *	Poor (except reflective LCD)	Average	Excellent

* - sunlight readability requires a peak brightness of >5K nits for readability in all conditions

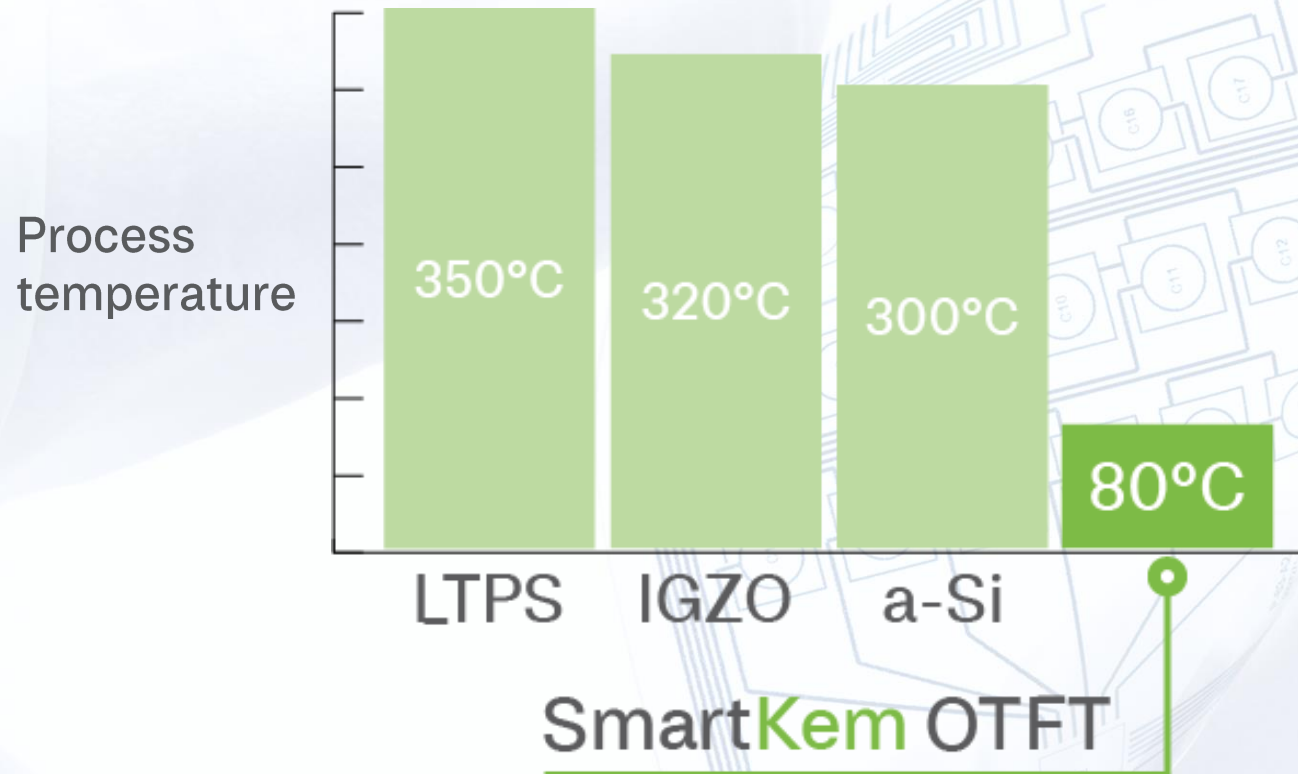


Mini/MicroLED, **how it's done today**

- Transfer of LEDs from individual R G and B epi-wafers, then solder or laser weld
- Yield of transfer is never 100% so costs are incurred for inspection and repair of faulty pixels



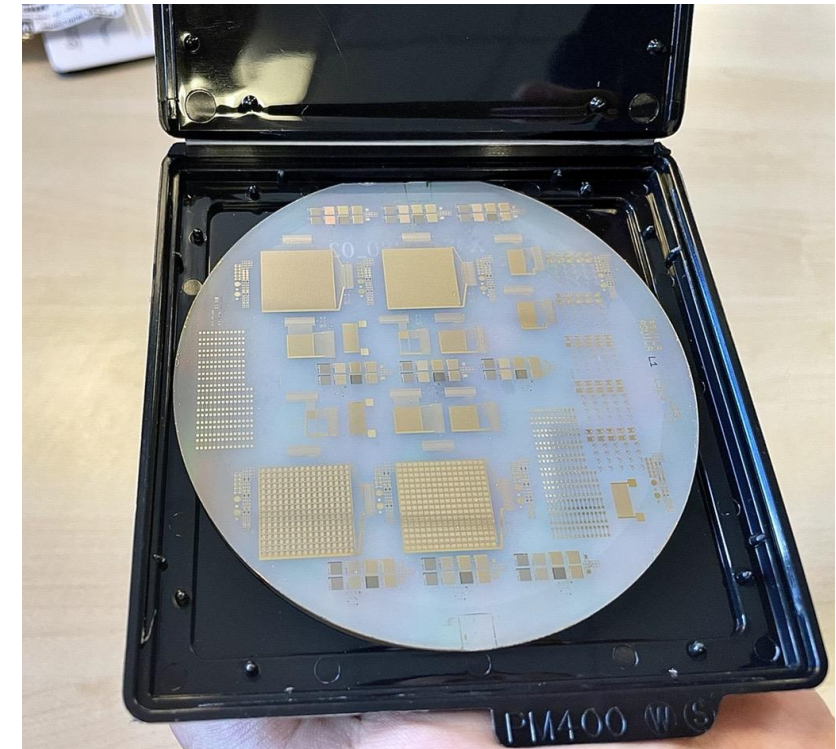
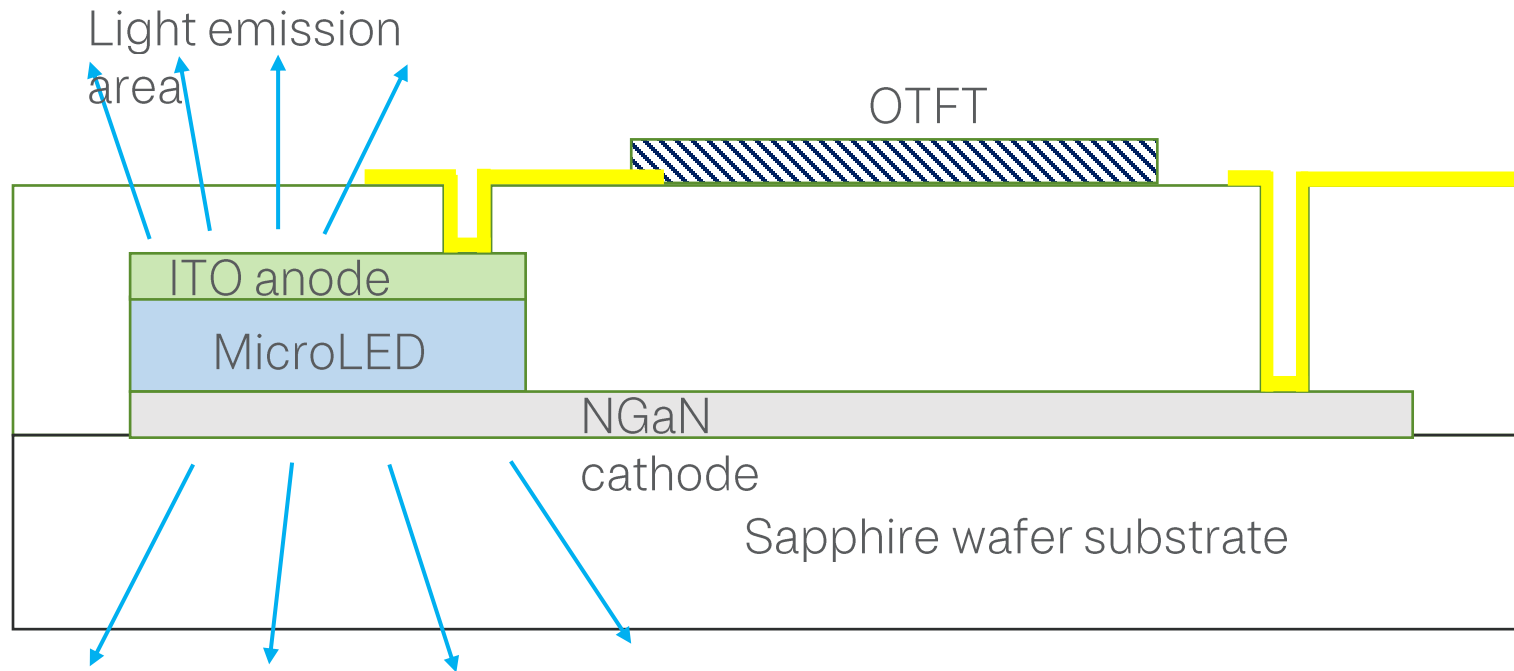
Processing temperatures for transistor backplanes



high temperature processing
damages LEDs

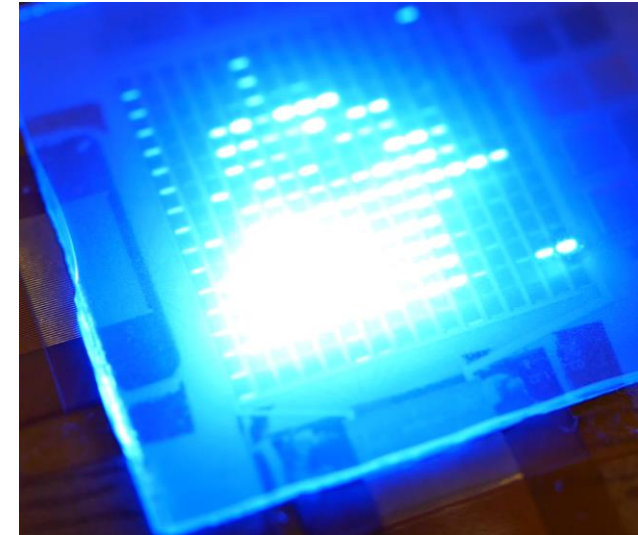
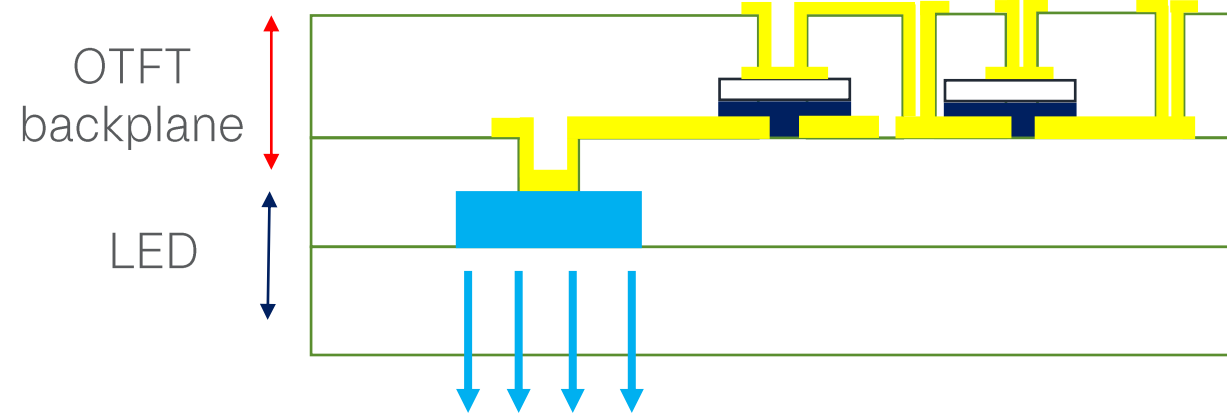
Micro LED Monolithically Integrated OTFT

- Using low temperature processing and direct laser writing to
 - Integrate OTFT backplane on top of u-LED array on Sapphire or Silicon wafer
 - Eliminate transfer losses



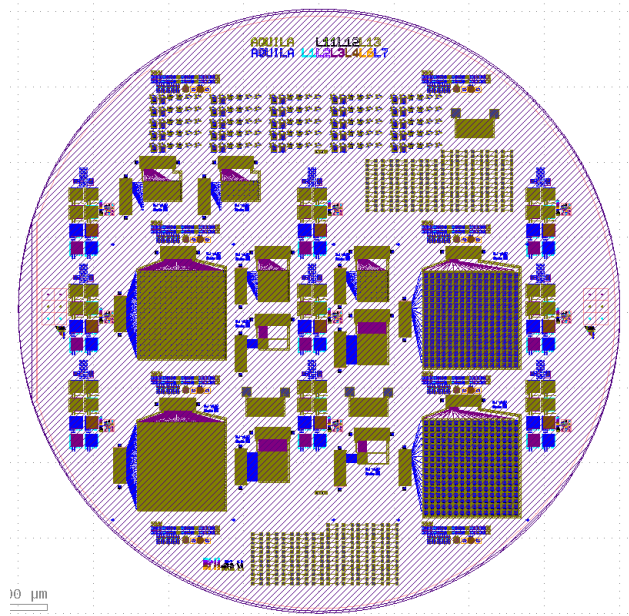
Micro LED Monolithically Integrated OTFT

- Low temperature process and direct laser writing
- Proof of concept design developed to show how OTFT can be processed on top of u-LED (no transfer so no transfer yield loss)
- Initial demos tested to >100K nits.
- Process can be scaled from 10ppi to >2500 ppi with appropriate lithography tools
- Colour can be integrated through the use of quantum dot colour conversion materials (printed or photopatterned)



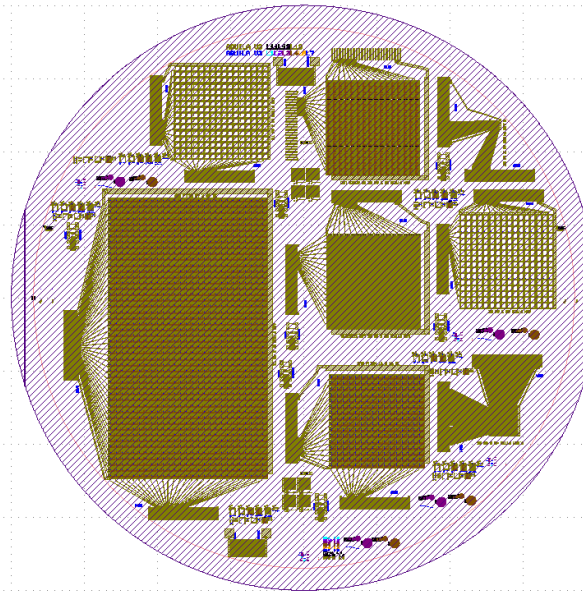
MicroLED Customer Specific Designs

V2 -16x16 and 48 x 48)



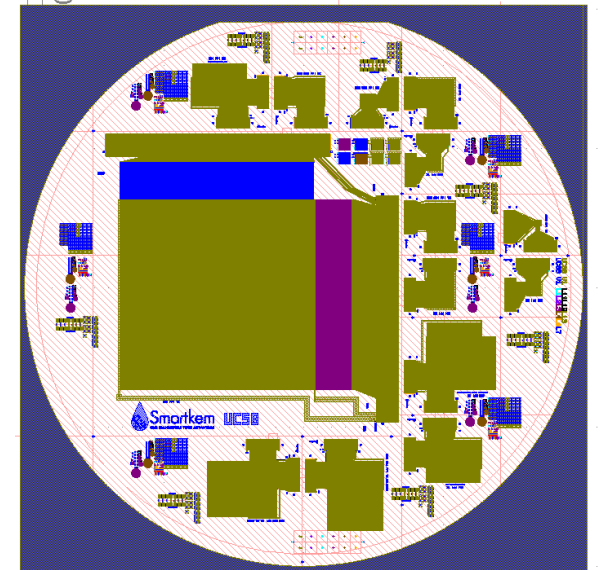
4" wafer

V3 - High brightness designs



4" wafer

V4- High resolution displays
(254ppi, 508ppi, 1500ppi)



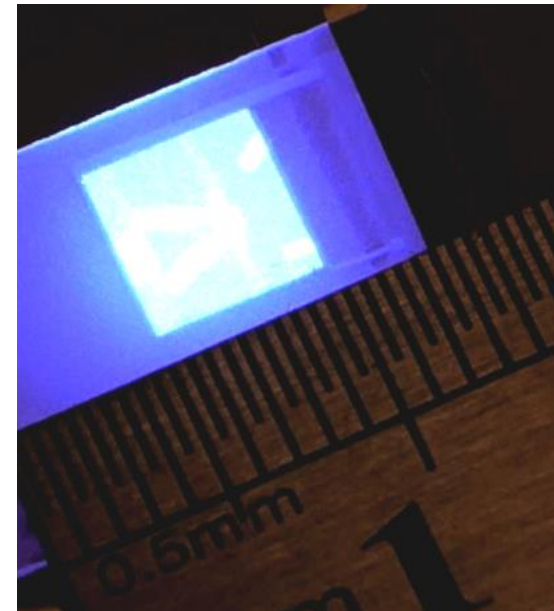
4" wafer



MicroLED Integrated OTFT Looking Forward

- 300mm wafers
- Backside wafer polishing
- Wafer saw process for dicing
- Integration of Gate on array circuits in OTFT
- Sub micron processing

- Aimed at VR and AR applications
- TAM \$720M (AR) & TAM \$600M (VR)

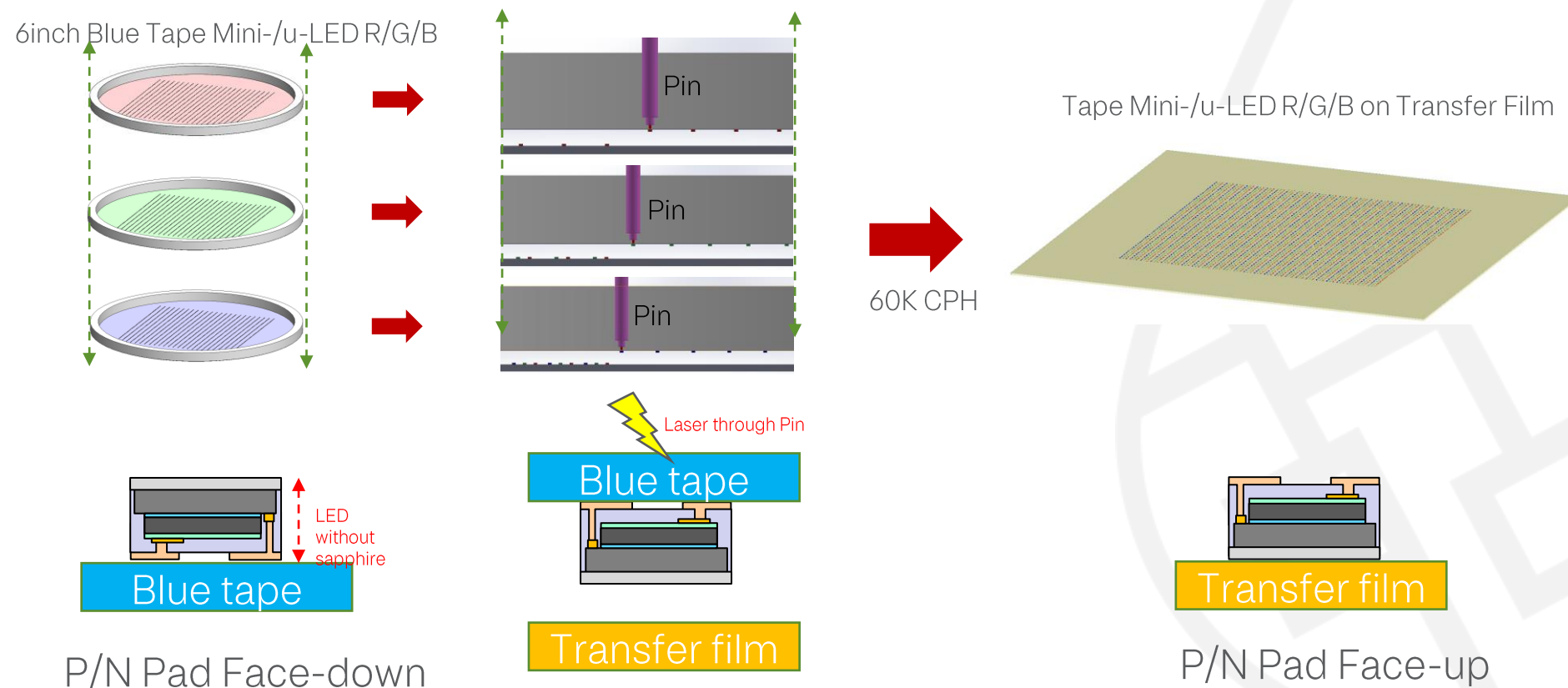


254ppi 100 micron pitch 48x48 display



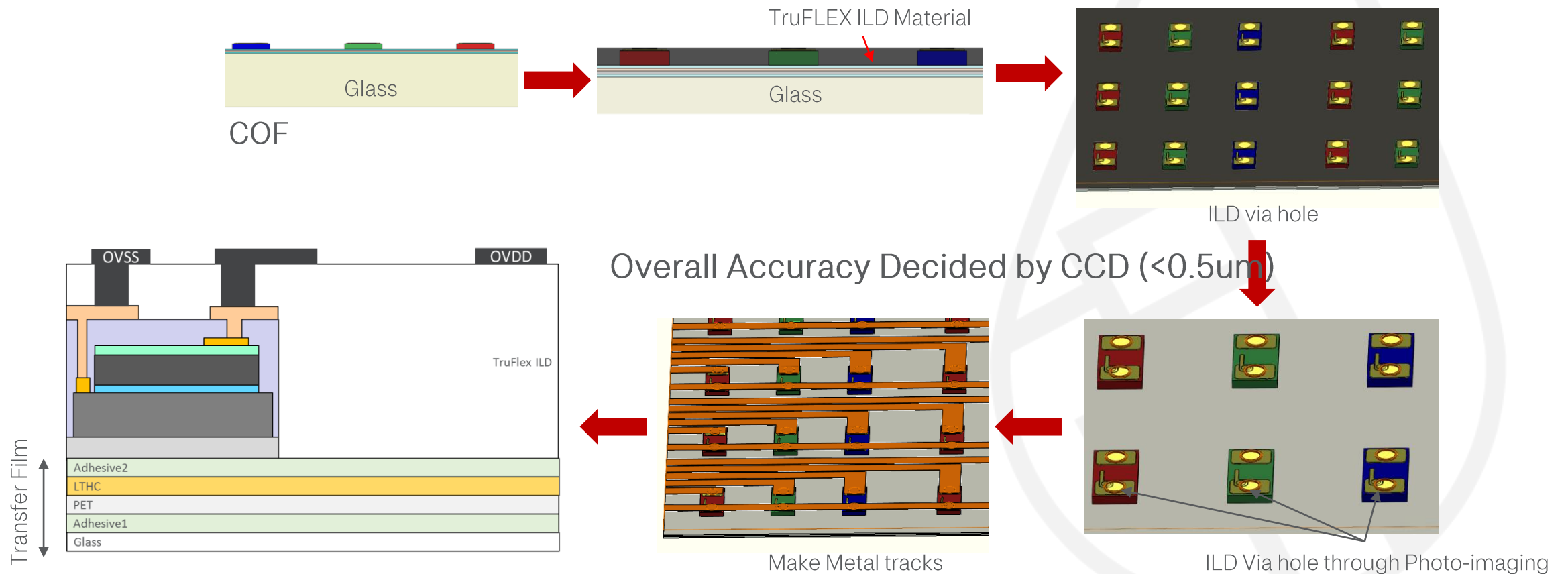
Mini/MicroLED how its done today – more detail

Mini-/u-LED Chip on Transfer Film process



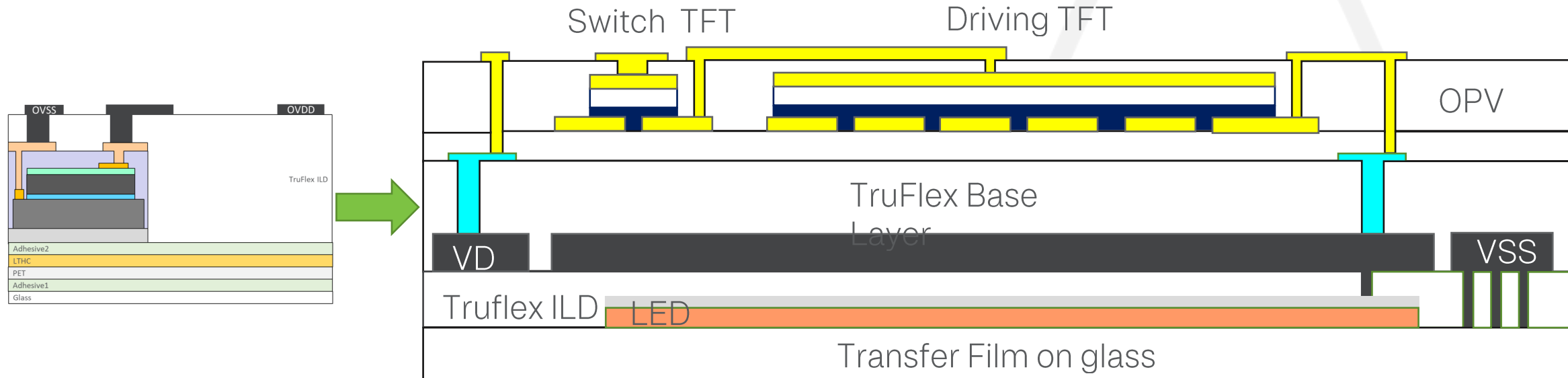
MicroLED Monolithically Integrated OTFT at large scale

Chip first RDL (Redistribution layer) process



MicroLED Monolithically Integrated OTFT at large scale

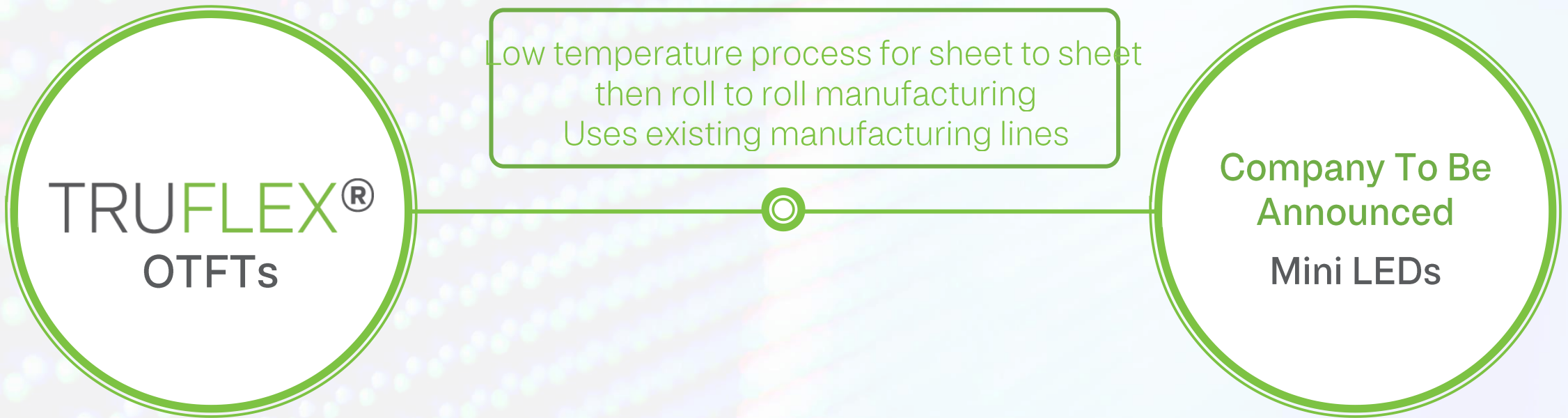
Step 4 : Active-Matrix Package (Low-T OTFTs)



targeting that battle
between LCD and OLED
TAM \$3.2B in 2022
TAM \$4.4B in 2026

Mini LED, Joint Development Agreement: A. N. Other

Taiwan-based company is a leading manufacturer in the global LED industry. This collaboration is expected to lead to the development of a roll-to-roll process for the manufacture of large format LED displays, a means of significantly reducing their cost of production.



SmartKem Officers



Ian Jenks
Chairman and Chief Executive Officer

Ian was formerly the president of Uniphase Inc, Chairman of Oplink Communications Inc which he took public on the NASDAQ and spent seven years as a partner of Crescendo Ventures llp Ian has been a director of Techstep ASA, Paysafe plc., and Brady plc.



Nigel Prue
Chief Accounting Officer

Prior to joining SmartKem in 2021 Nigel worked as Director of Finance at Global Eagle Entertainment Inc, a publicly traded company on NASDAQ. He was also a divisional finance director at construction companies Balfour Beatty Construction and Kier May Gurney. His early career includes public practice with PwC and controllership roles at AT&T. Nigel is a Fellow of the Institute of Chartered Accounts of England and Wales (ICAEW).



Dr. Beverley Brown
Chief Scientist

Beverley has worked in R&D at Imperial Chemical Industries Ltd. ("ICI"), Zeneca Group PLC and at the Avecia Group PLC. Beverley has worked in the field of organic semiconductor technology and in printable electronics for almost 20 years.



Dr. Simon Ogier
Chief Technology Officer

Simon has previously worked at Avecia, Merck, CPI and more NeuDrive Limited. He currently manages a team of 19 engineers and scientists using the equipment for SmartKem's process development and prototype fabrication. Simon has co-authored 30 journal articles and has been co-inventor on 16 patent families.



Sri Peruvemba
Chief Marketing Officer

Previously Chief Marketing Officer for E Ink Holdings, Sri played a major role in transforming the \$15M start-up to a \$1B+ global company. With over 30 year's experience in technology, Sri has held senior level positions at Sharp Corp, TFS Inc., Planar Systems and Novasentis.



SmartKem Board of Directors



Ian Jenks
**Chairman and Chief
Executive Officer**

Ian was formerly the president of Uniphase Inc, Chairman of Oplink Communications Inc which he took public on the NASDAQ and spent seven years as a partner of Crescendo Ventures llp Ian has been a director of Techstep ASA, Paysafe plc., and Brady plc.



Klaas De Boer
Director

Klaas serves as the Managing Partner of Entrepreneurs Fund Management LLP. He served on numerous boards, including Lifeline Scientific Inc. and Heliocentris Energy Solutions AG. He currently chairs AIM listed Xeros Technology Group plc, and General Fusion, Inc., and serves on the boards of vasopharm GmbH and D3O Holdings Ltd.



Barbra Keck
Director

Barbra served as the Chief Financial Officer of Deverra Therapeutics, Inc., a developer of cell therapies. She held positions of increasing responsibility at Delcath Systems, Inc., an interventional oncology company, starting as Controller and ultimately becoming a senior vice president in March 2015 and chief financial officer in February 2017.



Dr. Steven DenBaars
Director

Steven is a Professor of Materials and Electrical and Computer Engineering as well as the Executive Director of the Solid State Lighting and Energy Electronics Center at the University of California, Santa Barbara. Steven has previously worked at the Hewlett-Packard Optoelectronics team. He has been a Director on the Board of several startup companies which include Soraa Laser Diode, Akoustis Technologies and Aeluma Inc.



Looking forward...



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THANK YOU

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