Opportunities and Challenges for Flexible Electronics in the United States

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Agenda

- Policy initiatives
- Innovation and Materials Science Institute
- Applications
- Technologies in Development

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Policy Initiatives

Funding proposal to support development of flexible electronic technologies through the retooling of established capabilities in adjacent technologies

Adopt the methodology of the DOE Solid State Lighting program – phased development of enabling technologies and subsequent commercialization timelines

Intellectual property – current status hinders large company participation as entanglements prevent desirable freedom to operate transactions

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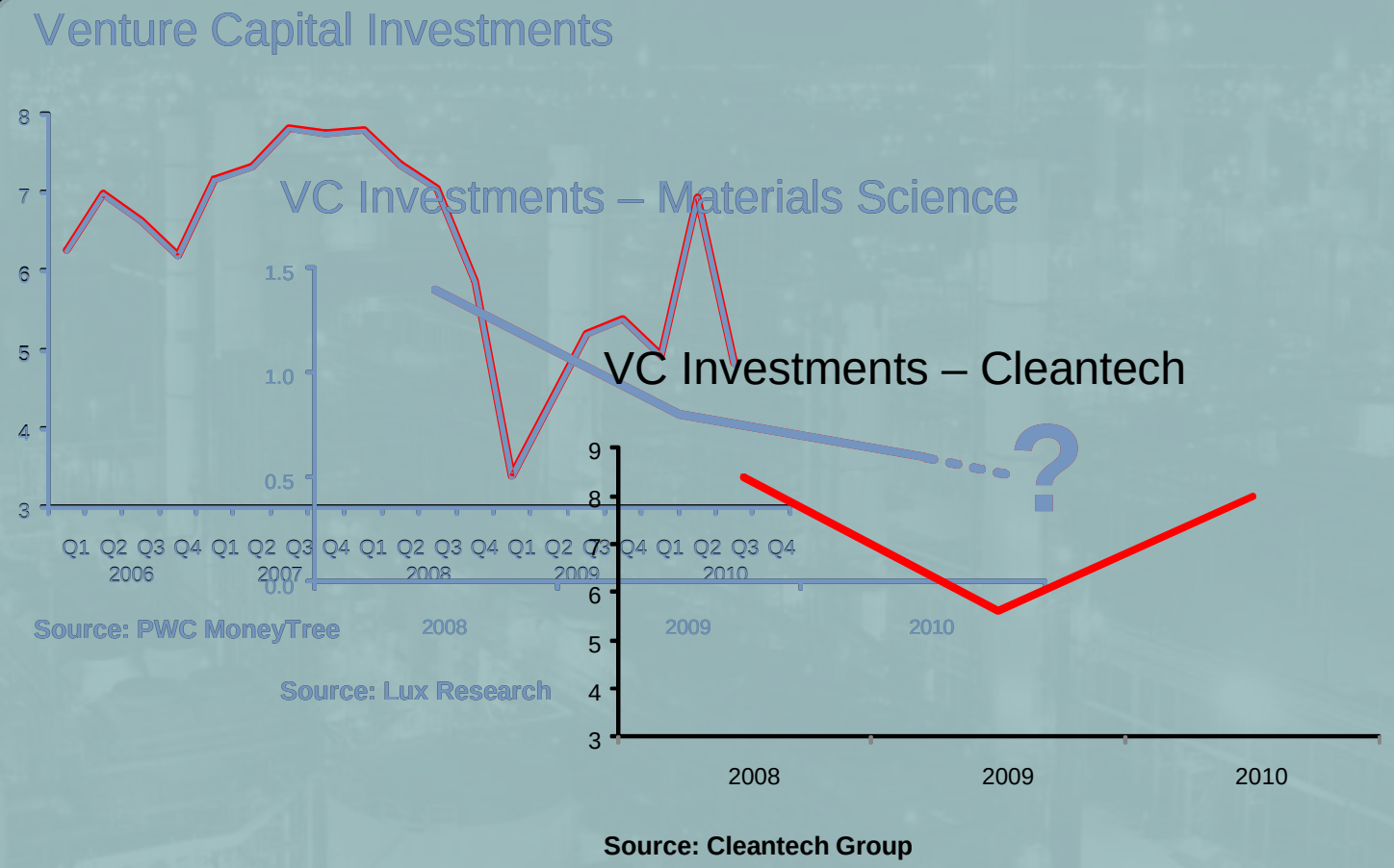
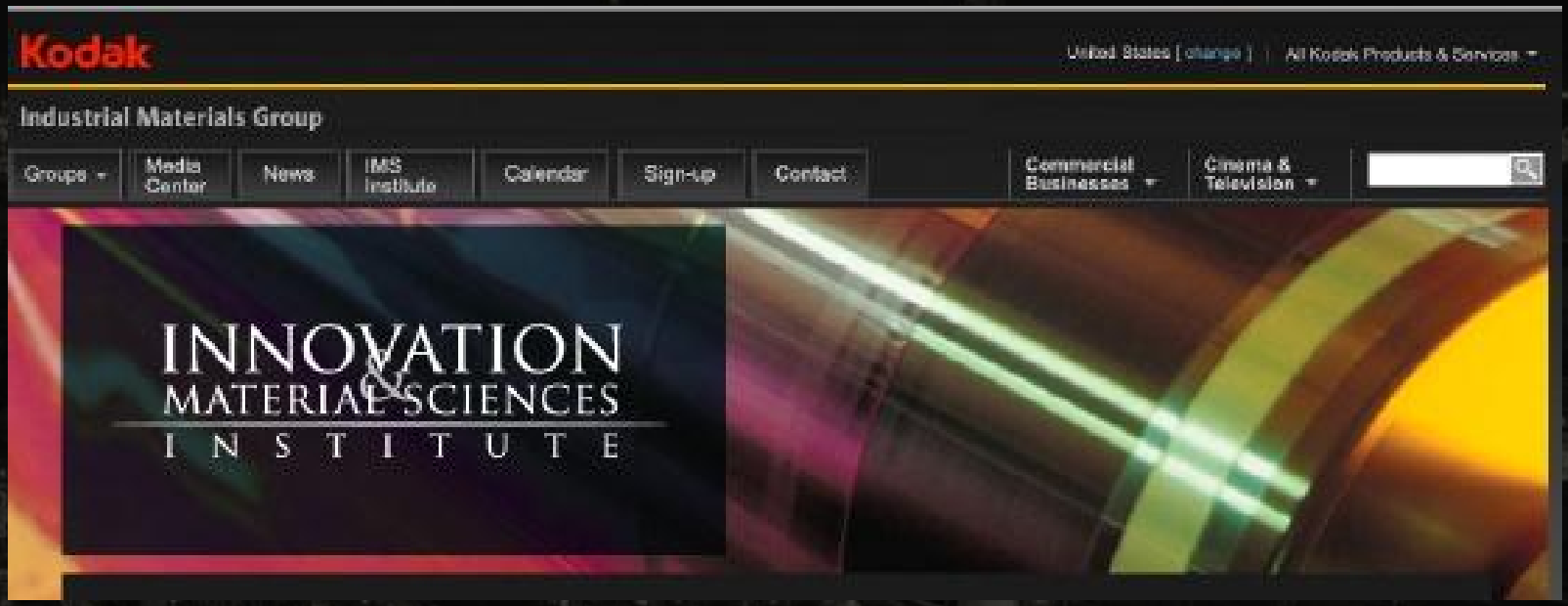
Venture Funding Trends



Innovation and Material Sciences Institute (IMSI)



- Demonstrated technical success in material science
- Confirmed a solution for a target market
- Credible business plan
- Constructed a world class team
- Introduction to funding partners and resources
- Explore possible partnerships with sponsors
- Broad support for commercialization needs

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The IMSI Initiative

For established firms

- Asset utilization
- Leverage human expertise
- Joint development opportunities

For start-ups

- Preservation of capital assets
- Less risky & less expensive go-to-market
- Joint development opportunities

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Applications

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Technologies in Development

- Transparent conductive films
  - Available today at commercial scale
- Functional features
  - Probing market needs
- Patternable conductive materials and components
  - Touch, photovoltaic, and packaging
- Future technologies
  - Demonstrated fully printable thin-film transistors

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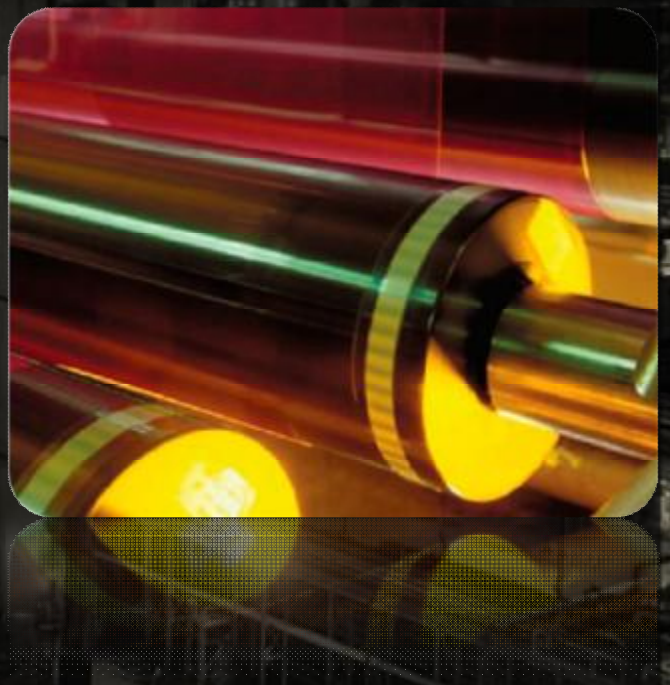
Transparent Conductive Films

An alternative to ITO that is

- Conductive
- Transparent
- Flexible
- Durable
- Patternable



PEDOT
4 to 7 Mil Clear PET
Primer
Optional Hard Coat

Commercially available as
KODAK HCF-350 Film / ESTAR Base

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Kodak Flexcel NX technology

Flexo advantages in Printable Electronics

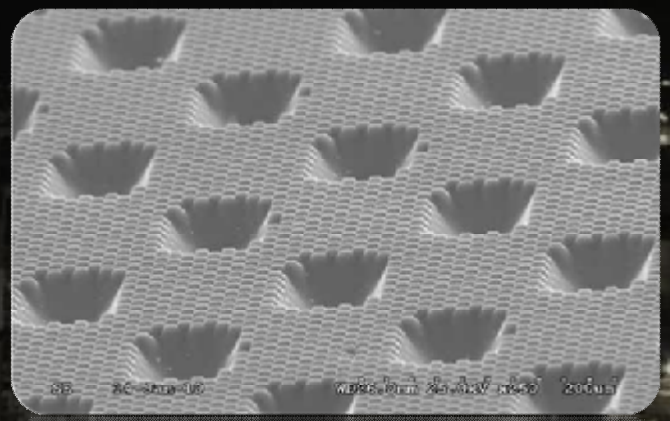
- Roll-to-roll, flexible substrate process
- Good ink and substrate latitude
- Can deposit small volumes
- Commercially proven process

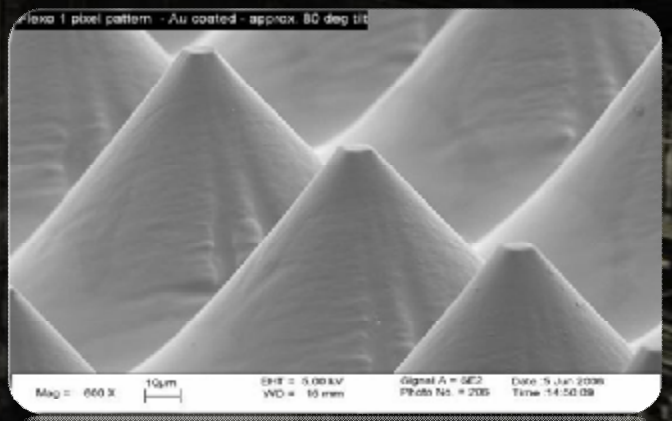
Kodak Flexcel NX technology enables

- Fine features down to repeatable 10 µm on plate
- Better ink transfer due to surface micro-texturization (KODAK DigiCap NX screening)

Ideal technology for Printable Electronics

- Fine conductive lines and grids
- Uniform solids with fewer voids





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Spatial-Atomic Layer Deposition

Deposition and patterning technology for:

Transparent conductors
Thin-film transistors
Barrier layers
Roll-to-roll manufacturing

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THANK YOU
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