

# FIE $\infty$ CE

National Centre for Flexible Electronics



## Call for Expression of Interest of Silver Nanowire (AgNW) based Ink for Transparent Conductive Electrodes

1<sup>st</sup> April 2024,

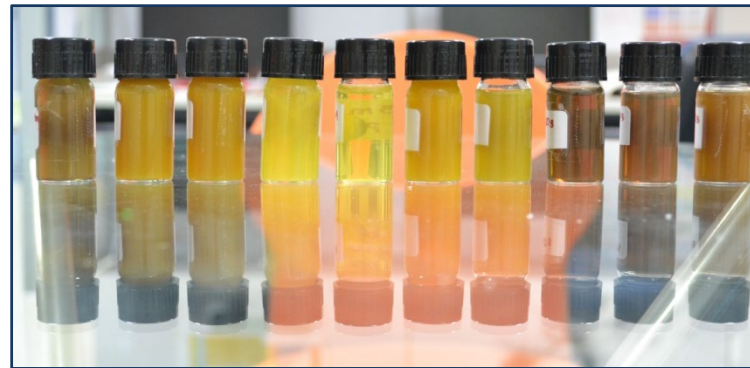


Poly IC



Mekoprint

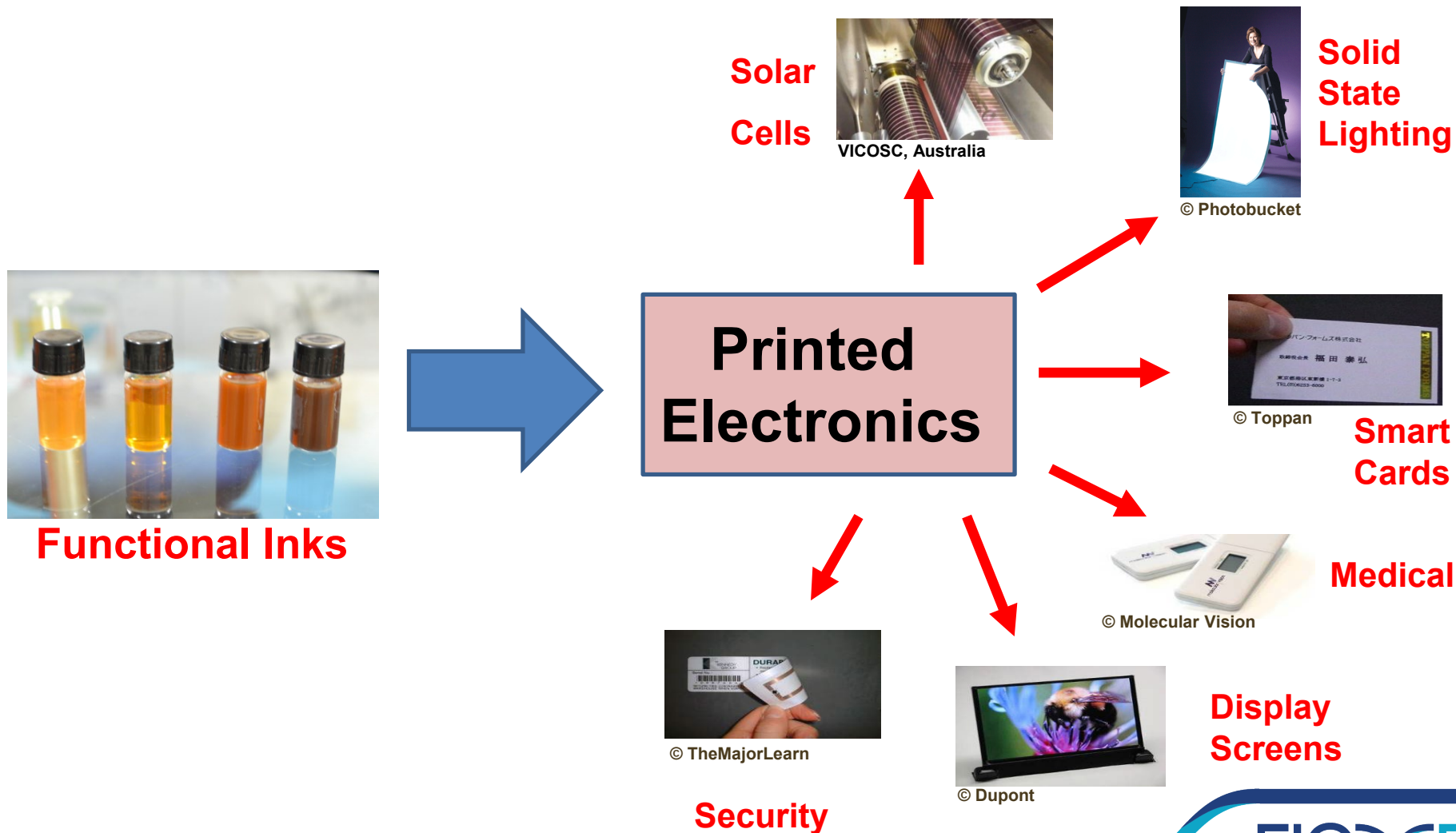
# Technology Development of AgNW based Ink for Transparent Conductive Electrodes(TCE)



# Background

- ✓ Flexible electronics is a new area of electronics which allows us to embed intelligence in form of electronics on paper, textiles, plastic, metal foils.
- ✓ Printed electronics enable the large area electronics at low cost with high throughput
- ✓ The motivation behind the printed electronic is to create large scale manufacturing of disposable electronics in a faster and cheaper way
- ✓ Functional inks are the key enabler for printed electronics

# Functional Inks – The Key Enabler



# Category of Functional Inks

## Conductive Inks

Ag, Au, Cu, Ni etc.

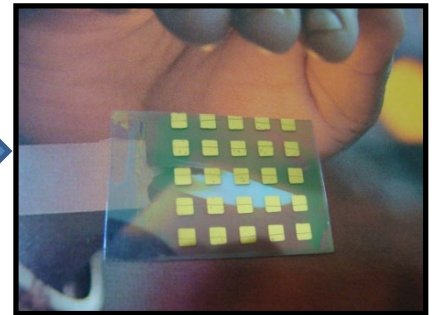
## Semiconductor Inks

Polymer, Oligomers, small molecules etc

## Dielectric Inks

Resin, polymers etc.

Printing



Products

# The Challenge

## Inks

- ✓ Conductive Inks
- ✓ Semiconductor Inks
- ✓ Dielectric Inks

## Printing method

- ✓ Gravure
- ✓ Screen
- ✓ Spray
- ✓ Flexographic
- ✓ Ink jet

✓ Products

**The key challenge:**  
Right formulation of ink for  
the appropriate substrate  
and printing method

Low processing temperature is suitable for plastics

# Current Technology Options for TCE Applications

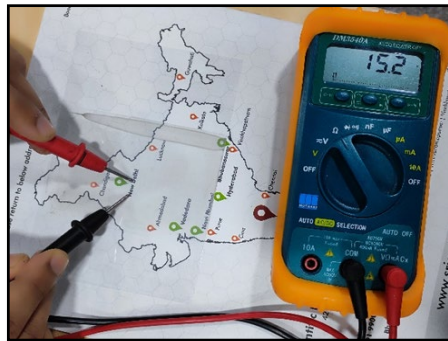
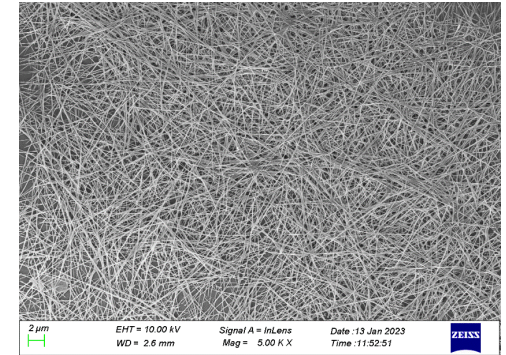
- ✓ Silver Nanowire base
- ✓ Copper nanowires based
- ✓ Carbon based inks
- ✓ Zinc oxide based
- ✓ CNT based

Key short comings:

- Transparency vs conductivity

# AgNW based ink for TCE

- ✓ AgNW based dispersions in polymer
- ✓ Highly conducting
- ✓ Stable products with good shelf life
- ✓ Low temperature processing for plastics



- ✓ Transparency 70-75 %
- ✓ Sheet resistance 50-100  $\Omega/\square$

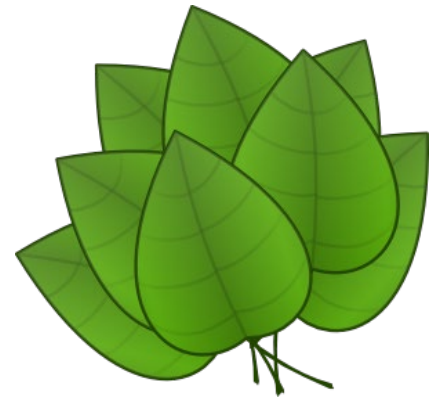
✓ Suitable for

Optoelectronic devices like solar cells, light emitting diodes, liquid crystal display, and touch screens

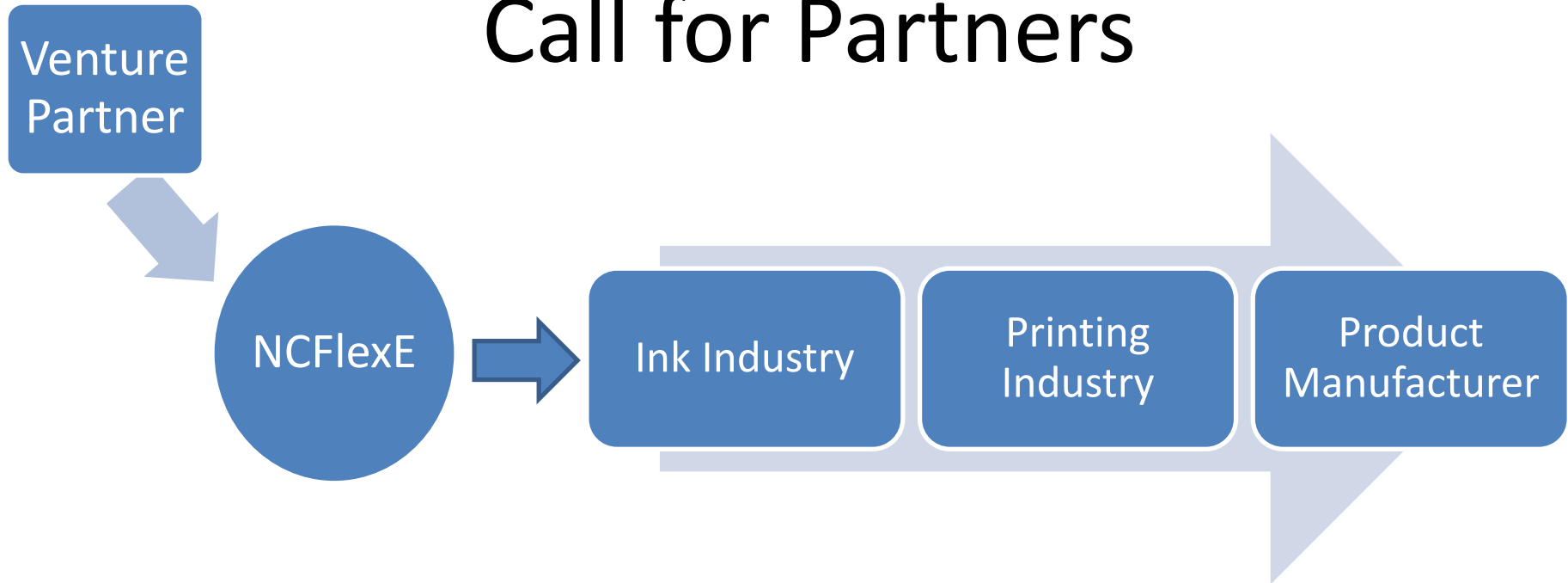


# Uniqueness of Product

- ✓ Customized proprietary solution as per the customer needs
- ✓ Low cost solution as compare to international market
- ✓ Eco-proprietary solutions
- ✓ Low temperature process



# Call for Partners



- ✓ Our centre is developing a variety of proprietary formulations for the printed electronics industry
- ✓ We are seeking partners across the value chain shown above
- ✓ We are looking for partners to enable the scaling and manufacturability of the developed processes
- ✓ Preferential terms for early partners

# Contact Information

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Also visit our webpage for more details on partnership models and other technology domains: [www.ncflexe.in](http://www.ncflexe.in)