PI-SCALE
SHAPING THE FUTURE IN OLED LIGHTING

PI-Scale : European pilot line for flexible OLEDs

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PHOTONICS21
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This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 688093

Lighting challenge

- At least half of the lighting needs are line or area sources
- Today's lighting solutions are LED based and LED is a point source
- Current solution is putting many LEDs together to make a line or area source

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OLEDs solution

- OLED is an area source by nature
- OLED has many additional features that allow for new applications

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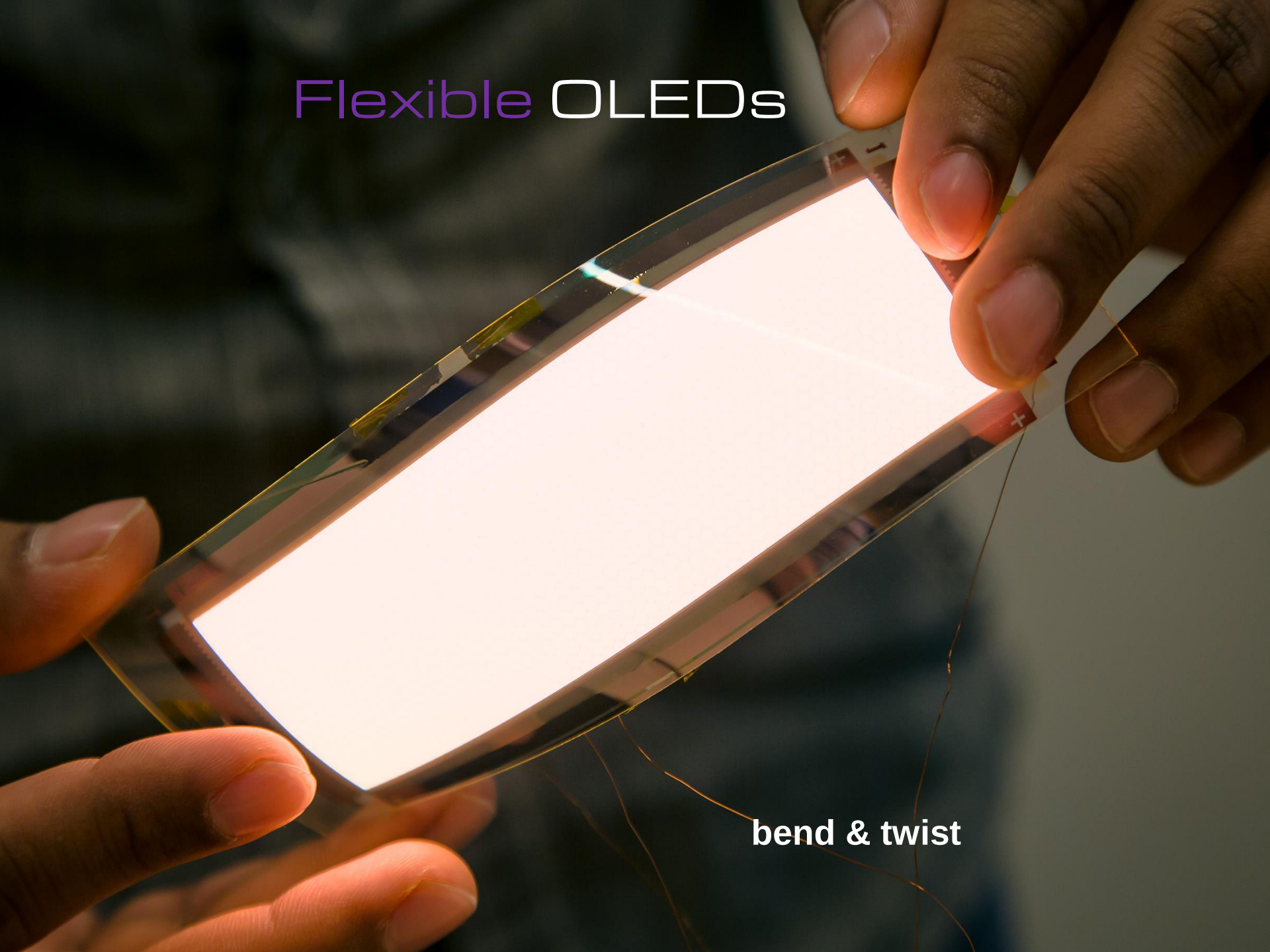
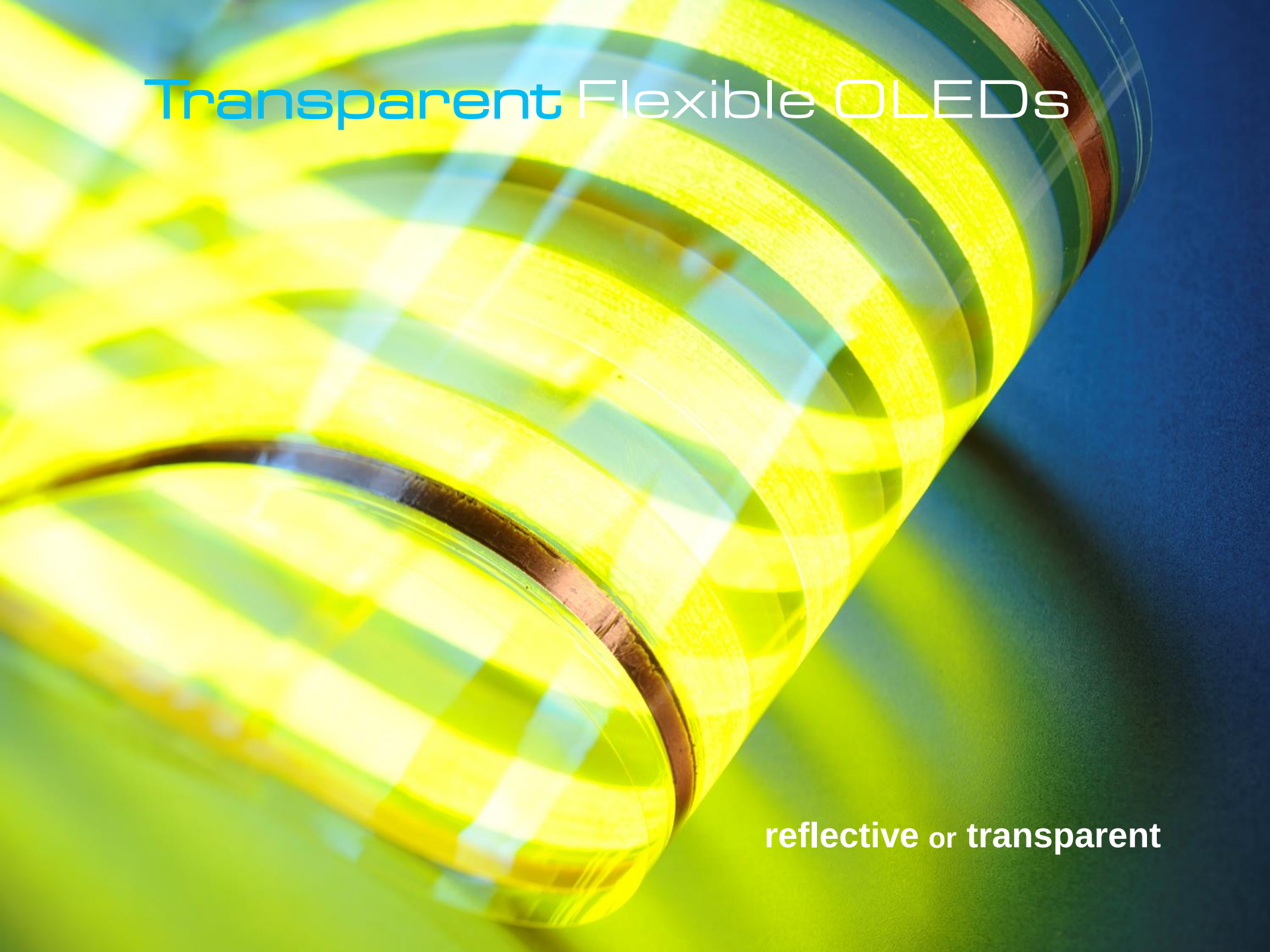
Flexible OLEDs



Customized Flexible OLEDs

any colour & any shape


Transparent Flexible OLEDs
reflective or transparent

New applications:

- Automotive
- Lighting
- Packaging
- Medical
- … and more

What is commercially available today

Companies:

- OLEDWorks, LG, Osram, …

Offerings:

- Set of fixed sizes and shapes and a limited set of colors

OLEDWorks OLED Developerskit

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What is not commercially available today

- Any shape, any size, any color
- High flexibility and small bending radius
- Long strips
- Transparent

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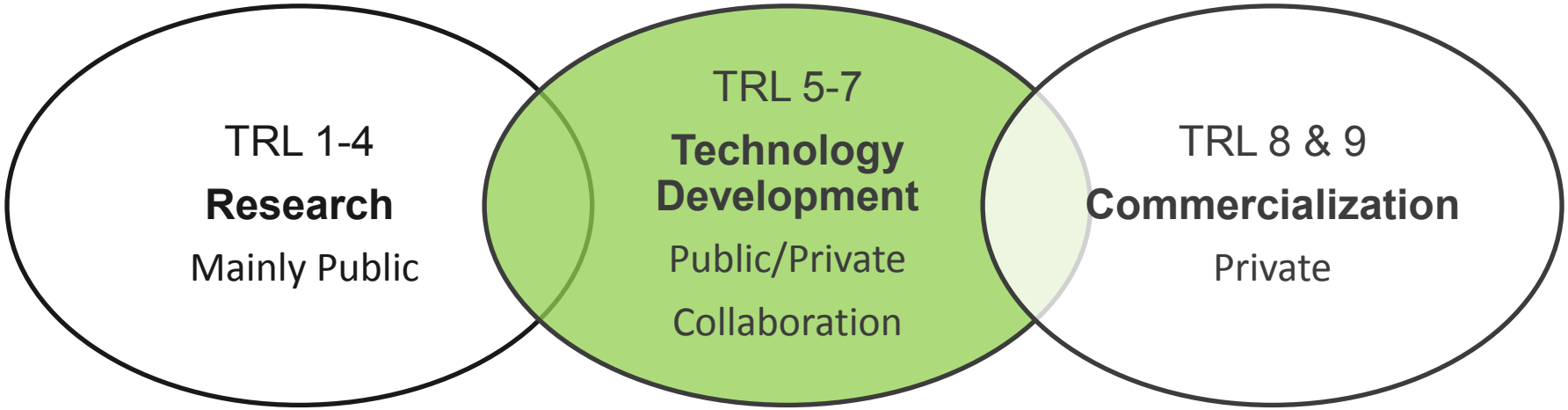
How to get those missing features?



The PI-SCALE pilot line service fills that gap and helps to translate your ideas into products

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PI-SCALE: Flexible OLED pilot line service

OBJECTIVE : Establish a sustainable flexible OLED industry in Europe by the creation of a flexible OLED pilot line service

PI-SCALE initiative

Open access flexible OLED pilot line service

2016 2017 2018 2019 →

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Consortium

PI-SCALE
SHAPING THE FUTURE IN OLED LIGHTING

Institutes:

Holst Centre
Open Innovation by imec and TNO

VTT

Fraunhofer FEP

cpi

Supporters:

Brabant Development Agency
BOM

AMIRES

Suppliers:

DuPont Teijin Films™

FlexEnable
Truly flexible electronics

Coatema®
Coating Machinery GmbH

M-SOLV

End users:

REHAU

PILKINGTON

Audi
Vorsprung durch Technik

emdedesign
development of light

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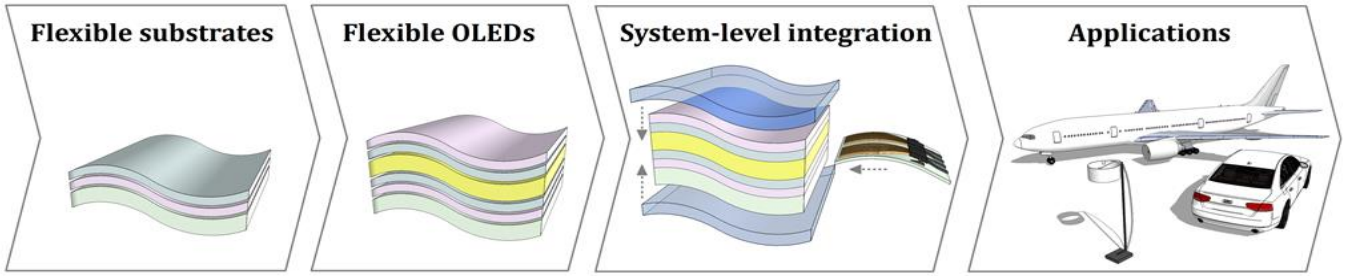
Capabilities

The pilot line includes all the steps required to create advanced flexible OLED product prototypes:

- High performance **moisture barrier** and **electrode films**
- **Flexible OLED fabrication** in sheet-to-sheet and roll-to-roll process
- Flexible device **encapsulation**
- **Lamination**, **bonding** and **system-level hybrid integration** of thin film flexible electronics



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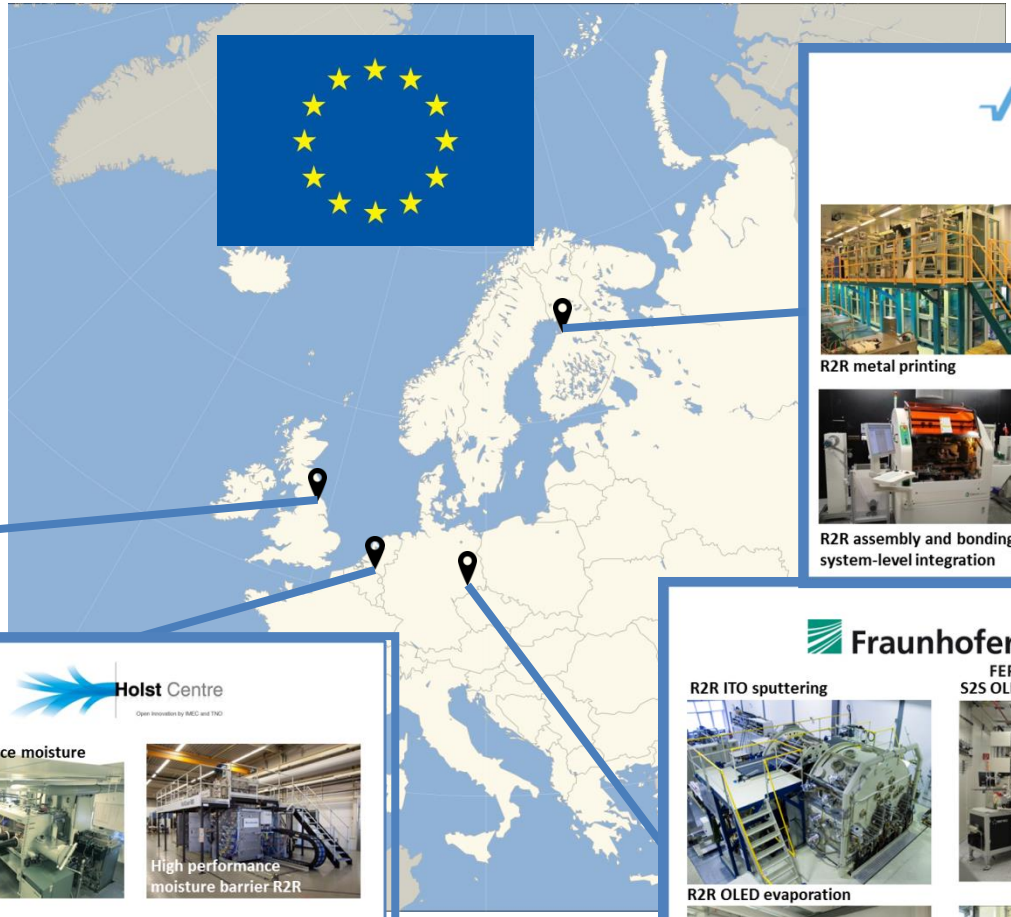
Distributed pilot line

PI-SCALE integrated existing European infrastructure into a

European flexible OLED pilot line



cpi

S2S and R2R deposition tools and laser cutting and finishing

VTT

R2R metal printing

R2R system-level testing

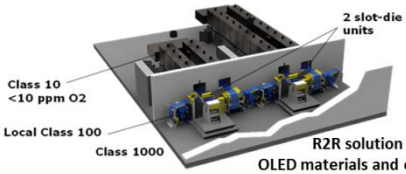
R2R assembly and bonding for system-level integration

R2R injection moulding

Holst Centre

High performance moisture barrier S2S

High performance moisture barrier R2R



R2R solution coating of OLED materials and electrodes

Fraunhofer

R2R ITO sputtering

FEP
S2S OLED evaporation

R2R OLED evaporation

R2R lamination of moisture barrier film

This project has re… research and innovation prog…

R2R process movie

- *Movie from Holst Centre on R2R flexible OLED production to illustrate capabilities of the partners of the PI-SCALE initiative*

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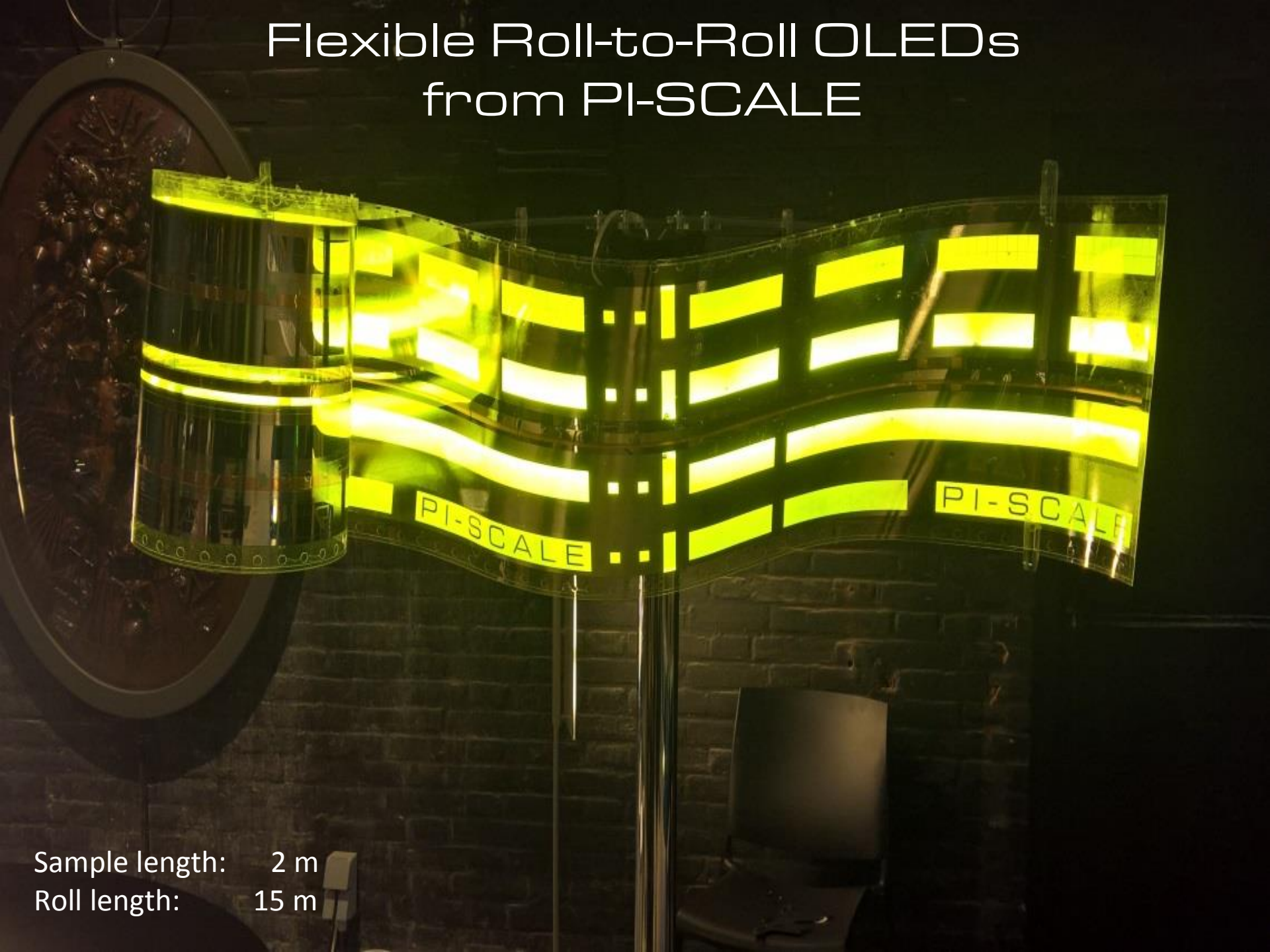
Flexible Sheet-to-Sheet OLEDs from PI-SCALE

Substrate size: 0.2 x 0.2 m

Flexible Roll-to-Roll OLEDs from PI-SCALE



Sample length: 2 m
Roll length: 15 m

Service offering

- **Prototyping and pilot production** of customized flexible OLED devices
- **System-level integration** of flexible OLEDs into prototypes
- Access to **independent specialists** and **know-how** of flexible OLED technology

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Features offered 2017

- Highest flexibility
  - Bending radius down to 10 mm
- Most colors
  - Red, Green, Blue, Orange, Yellow, Magenta, Cyan, White, …
- Ultra-thin
  - Thickness 0.2 mm
- Any shape and design
  - Fully customized

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Features offered 2018

- Any size
  - Length >15 m
- …

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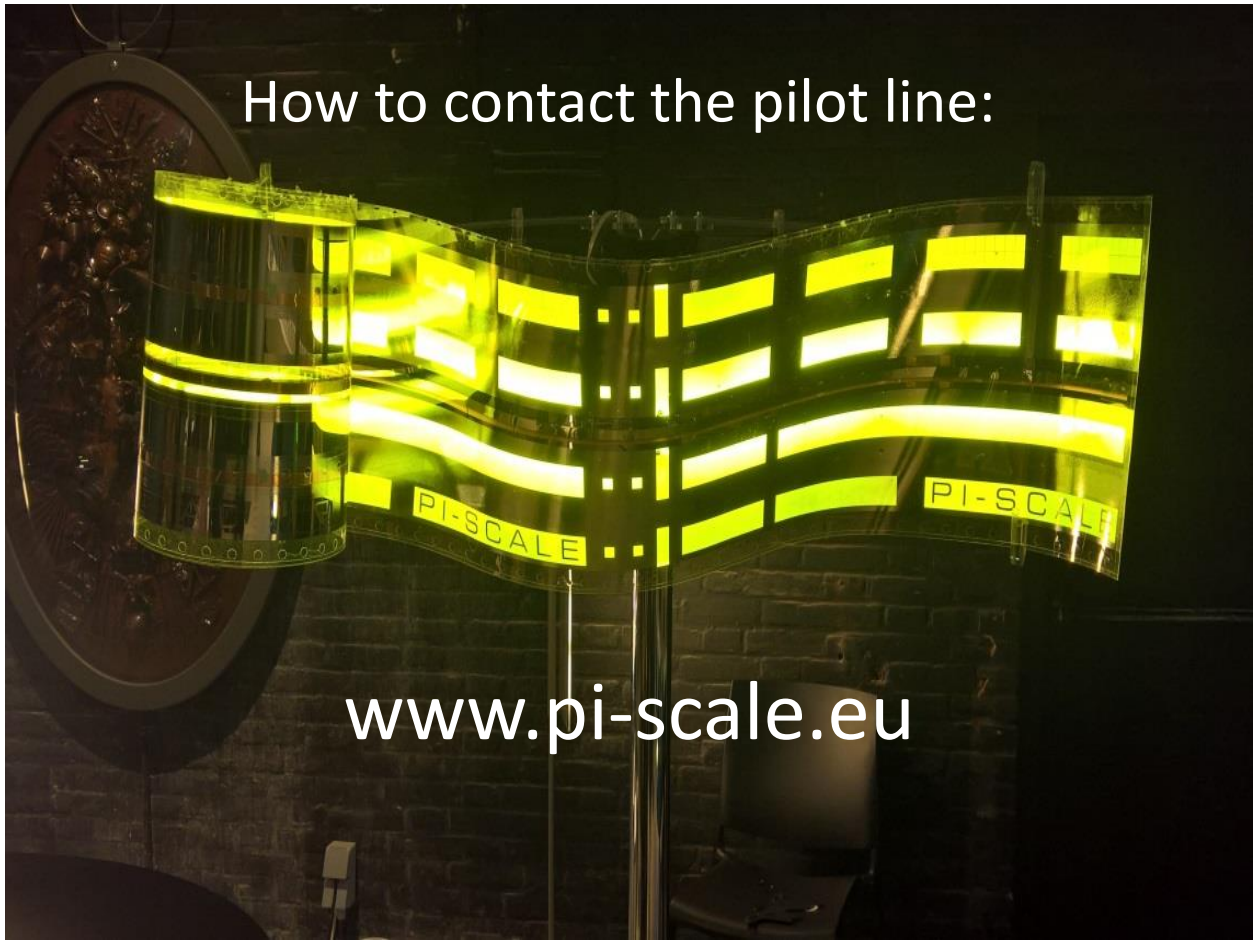
Contact & Questions



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