



LEE-BED

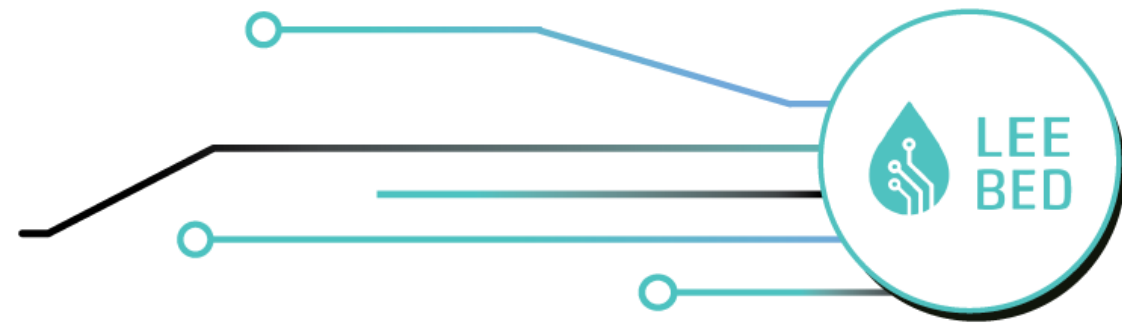
*Bring your ideas and concepts to market using lightweight,
flexible, printed electronics*

Description of the results and essential stakeholders



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 814485

LEE BED



LEE BED brings together an innovation supply chain for printed electronics



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Benefits of printed electronics



Printing electronics can

- Reduce the thickness of an electronic device
- Reduce the cost of production
- Produce flexible devices

Making it ideal for:

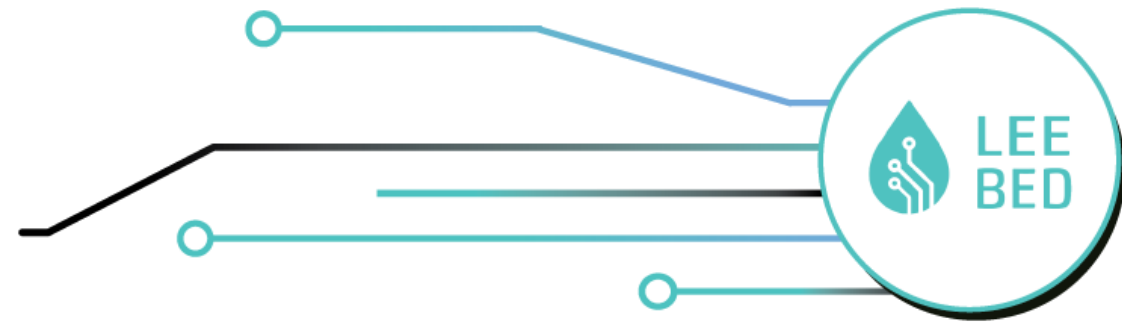
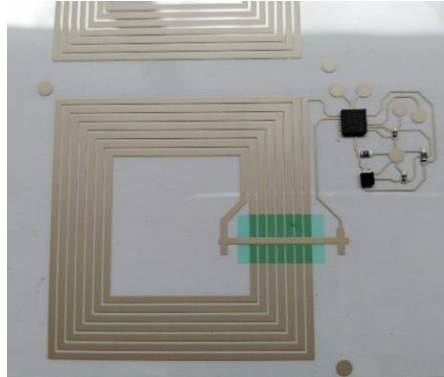
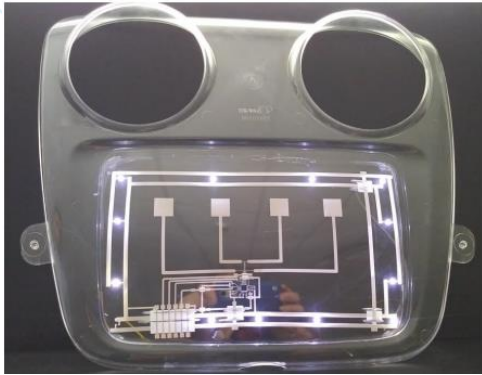
- Embedded devices
- Packaging and FMCG
- Wearables and conformable electronics

Printed electronics brings together: electronic engineering, materials science, formulation science, printing engineering, component integration, and device testing.



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How was this done?



LEE BED was built around four commercial partners to create an internal commercial pull within the project.

The customers covered.

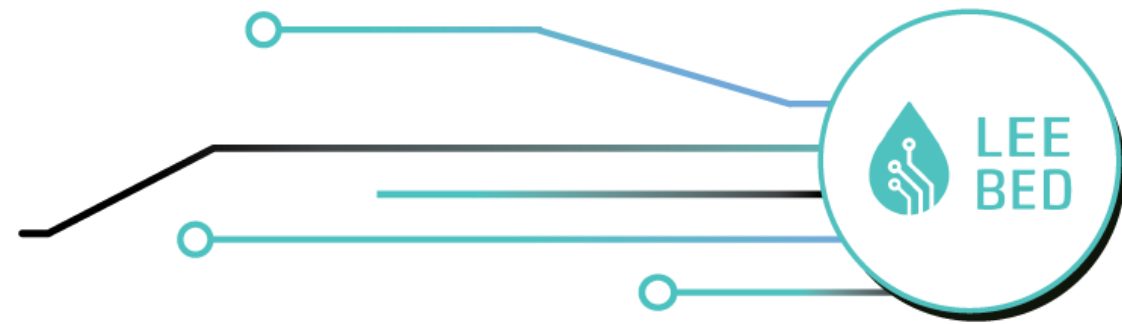
- Smart packaging: low cost, small form factor, interactive electronics.
- Aesthetic applications: wearables, 3D printed and transparent electronics.
- Construction: embedded sensing and asset tracking devices
- Automotive: conformable embedded electronics

The varying requirements of these different industries ensured LEE BED was built fit for purpose.



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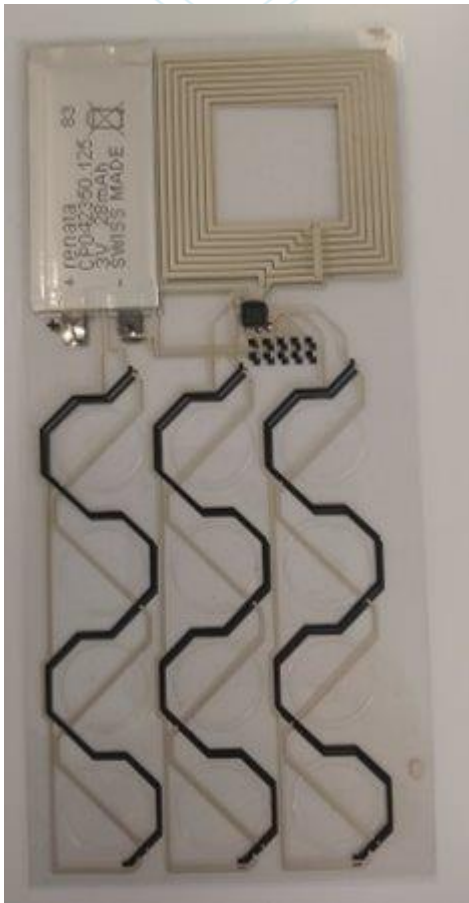
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What goes into printed electronics?



Printed electronics have to be:

- Designed as a working electronic circuit. This must account for constraints of printed circuits.
- Produced from materials that meet the requirements of the circuit.
- Produced from materials that meet the requirements of its end function. It must not fail in application.

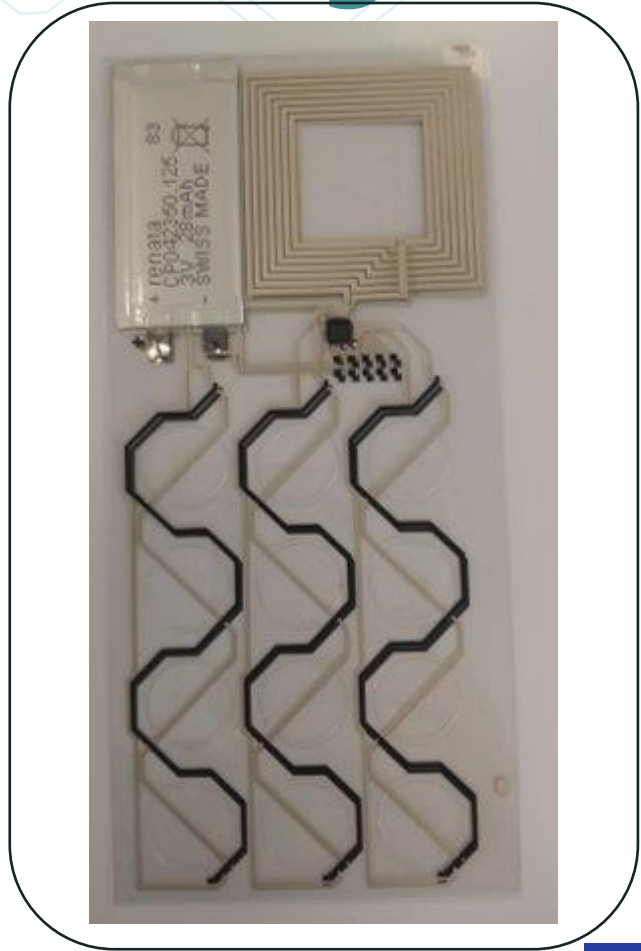
This requires a multidisciplinary approach and innovation at every length scale.



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What goes into printed electronics?



Circuit design must take into account the final application (function, footprint, print thickness) and the nature of printed tracks.

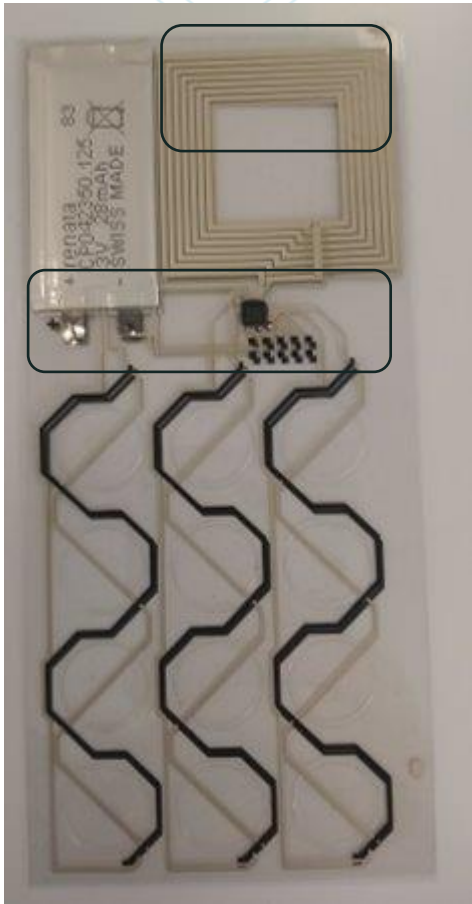
Once assembled it must be tested and programmed using methods suitable for printed electronics.



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What goes into printed electronics?

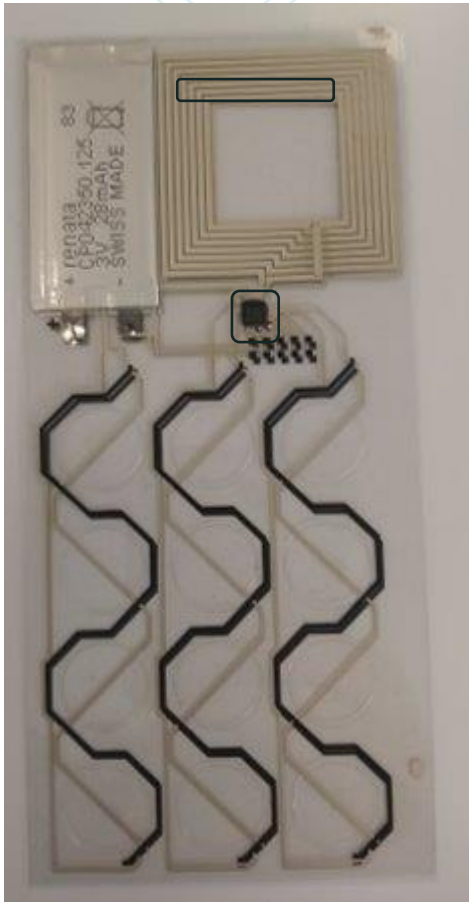


The assembly of the circuit requires inks and adhesives that perform electronically, are compatible with the assembly process, and can survive during their functional life.



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What goes into printed electronics?

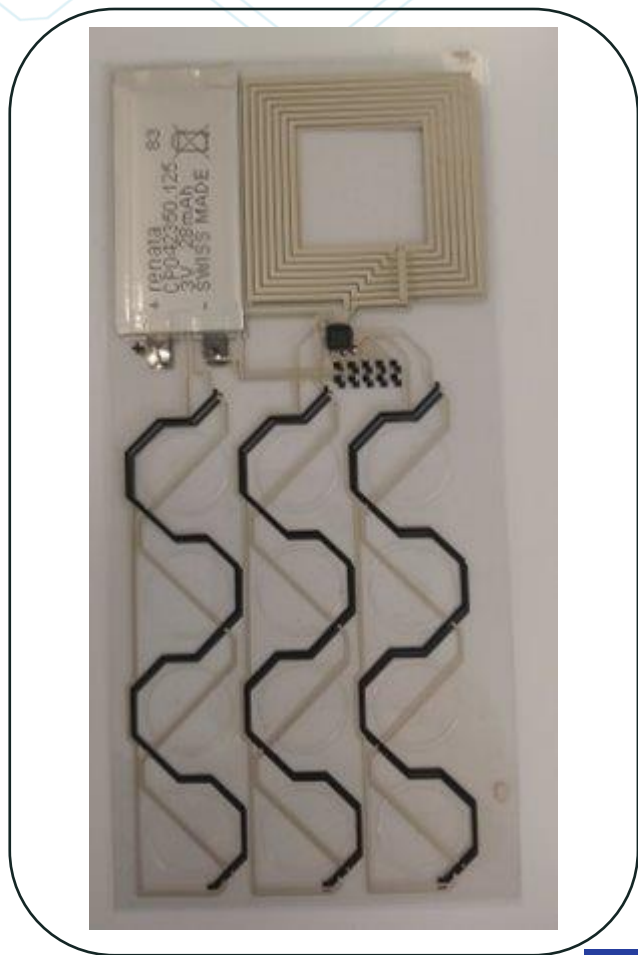
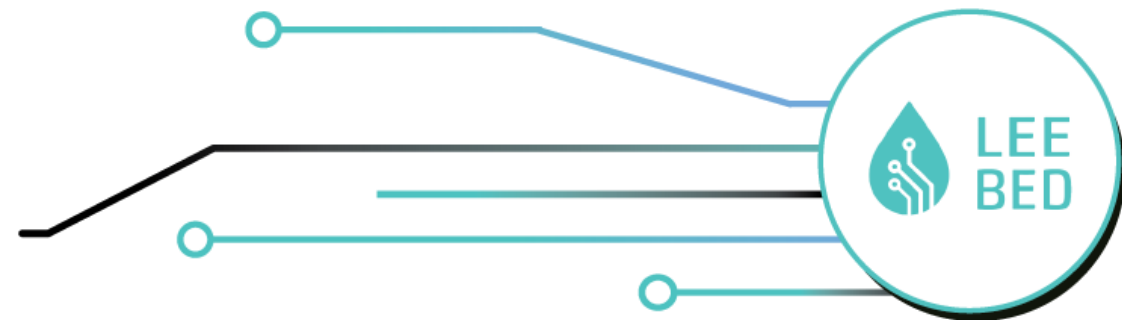


The inks and adhesives require functional additives to make them functional such as electrically conducting, resistive or thermally conducting nanoparticles.



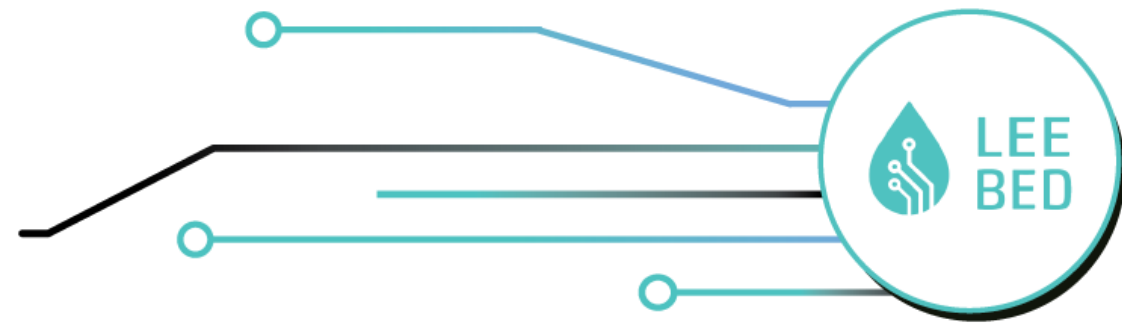
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LEE BED supply chain



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The nanomaterials line provides access to new materials produced by either wet chemistry or gas phase synthesis.

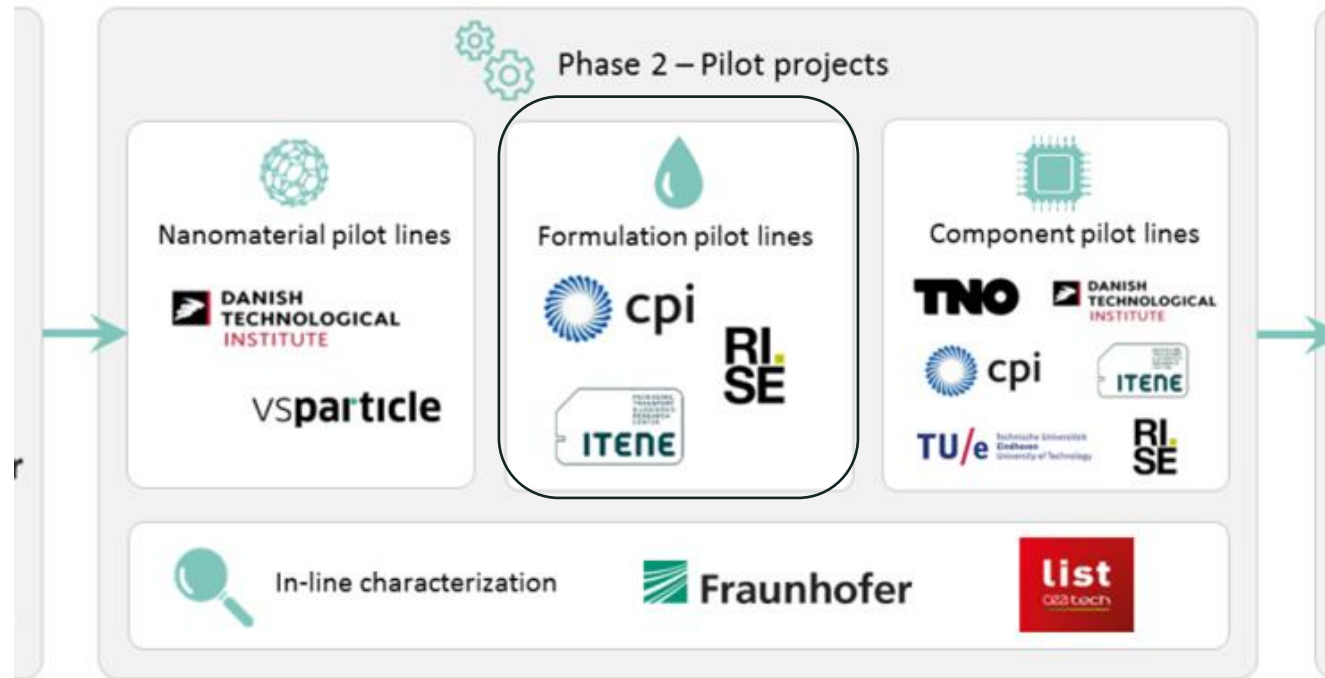
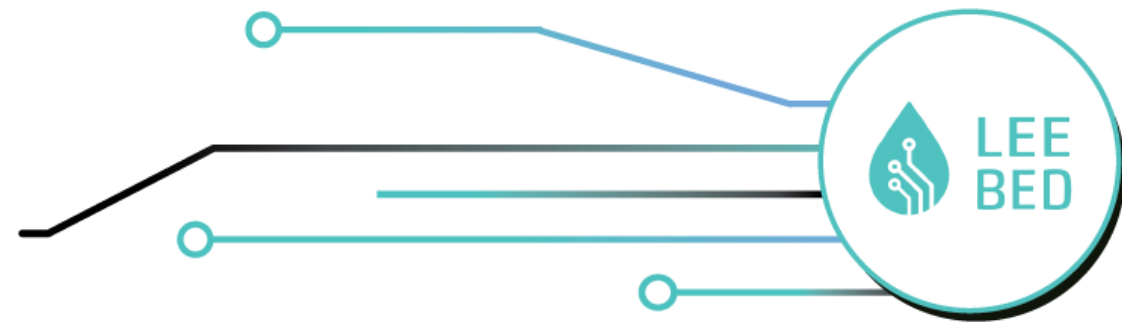
The functional materials produced are relevant to printed electronics and sensing.

The pilot line contains state of the art, process controlled synthetic capability.



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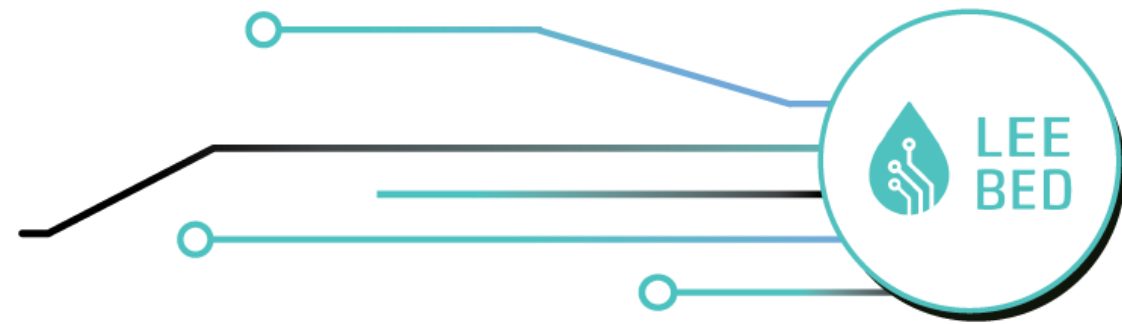
The formulation line offer a range of services including:

- The development of functional inks including inkjet, screen and flexographic.
- The development of functional adhesives
- The development of functional resins
- The automated optimisation of inks, adhesives and resins.



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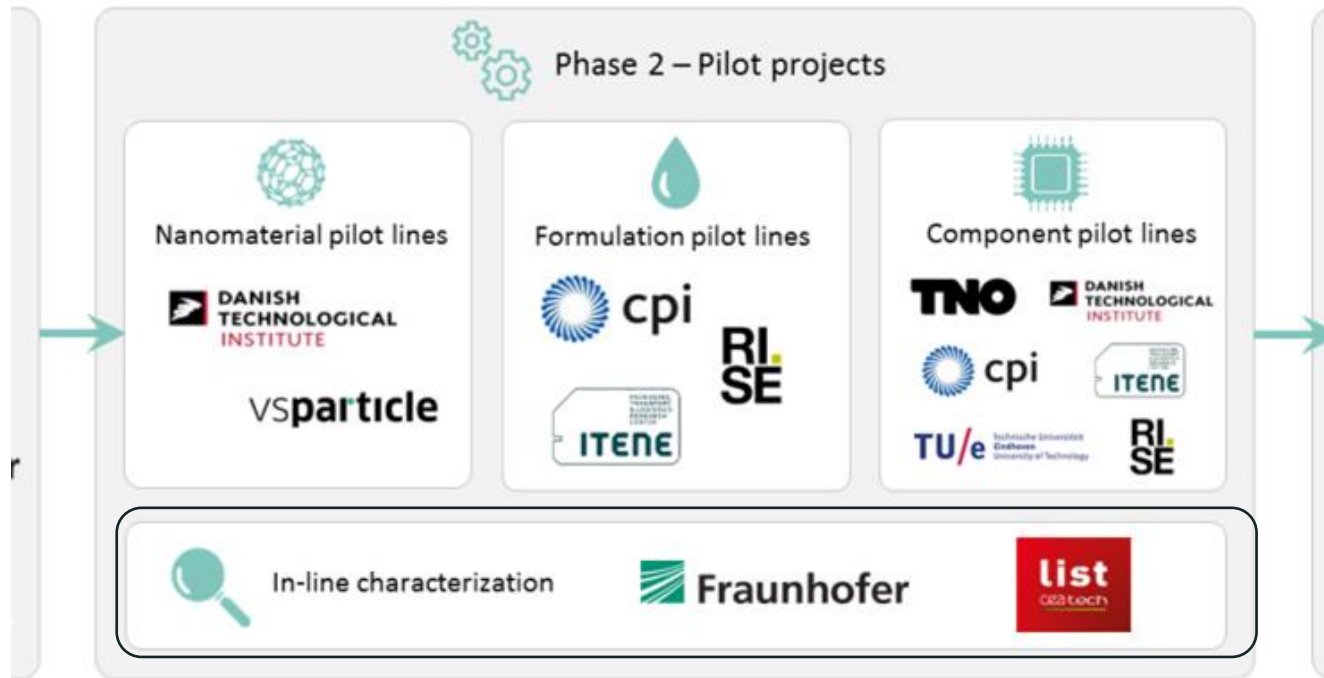
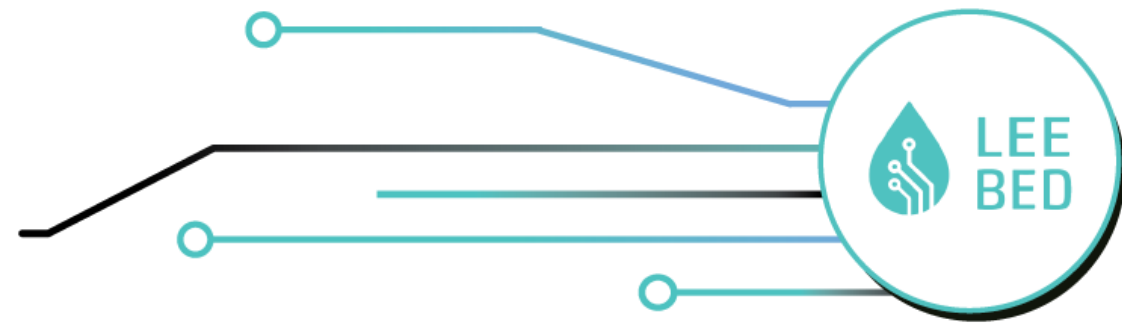
The component pilot line can offer:

- State of the art print capability in batch or roll to roll and in 2D or 3D print formats.
- State of the art integration capability.
- State of the art circuit test capability.



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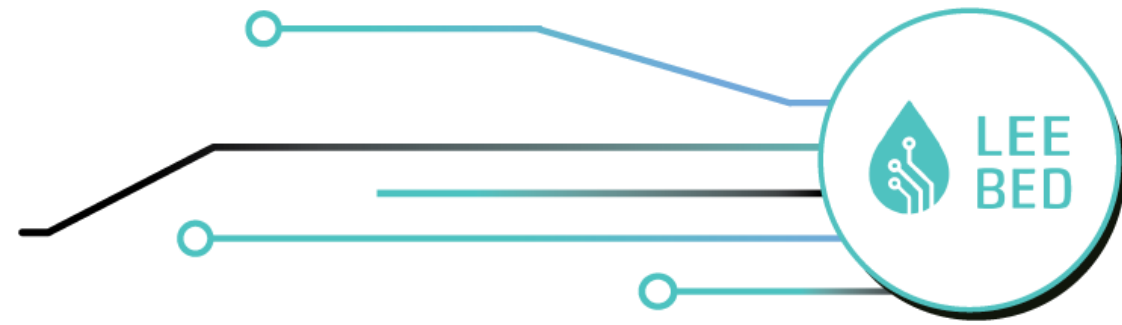


The inline characterization capability provides state of analytical capability to better optimise and trouble shoot complex devices. Services such as computed microtomography and X-ray transmission analysis are available.



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LEE BED stakeholders



End users:

LEE BED can design and fabricate printed electronic devices with new functions or form factors

Device manufacturers:

LEE BED can help you innovate in the design, production and testing of devices. LEE BED has expertise in formulation and nanomaterial production allowing devices with new functions to be produced.

Formulators

LEE BED can evaluate new products on state of the art 2D and 3D print and assembly equipment. LEE BED provides formulation expertise helping you optimise and develop your products.

Nanomaterial manufacturers

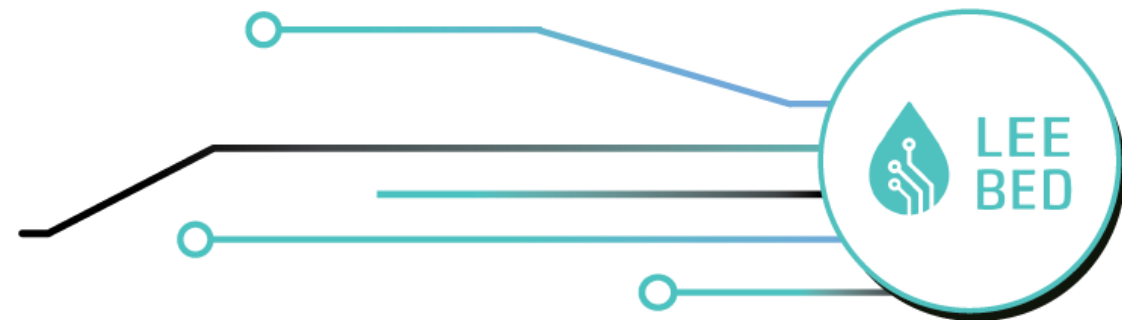
LEE BED can optimise your product, process it into ink, adhesive or resin formulation and trial these materials in new devices allowing you to access new markets.



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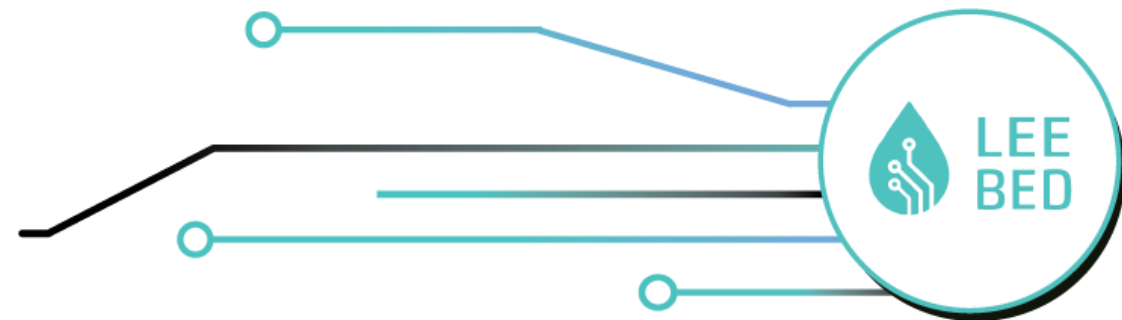
LEE BED

Phase 1 and 3 services

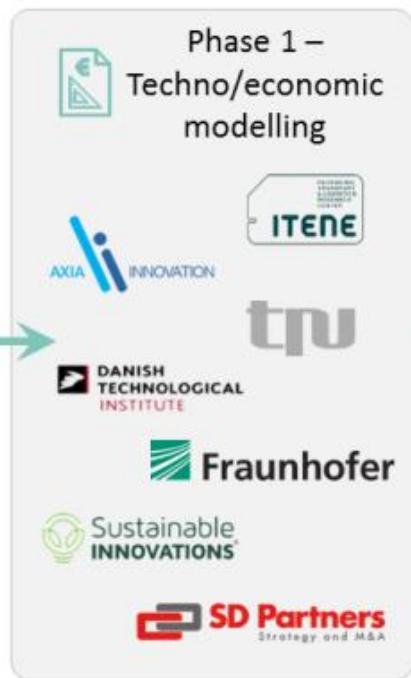


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Phase 1 Services



SINGLE
ENTRY
POINT



Phase 1 services provide the upfront assessments of your ideas covering:

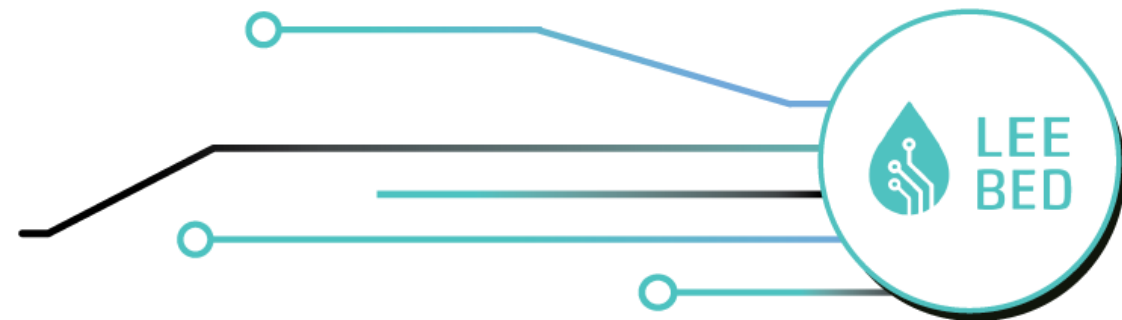
- Technical
- Economic
- Environmental
- Intellectual property
- Funding

Combined these provide LEE BED customers with a critical first assessment of their product.

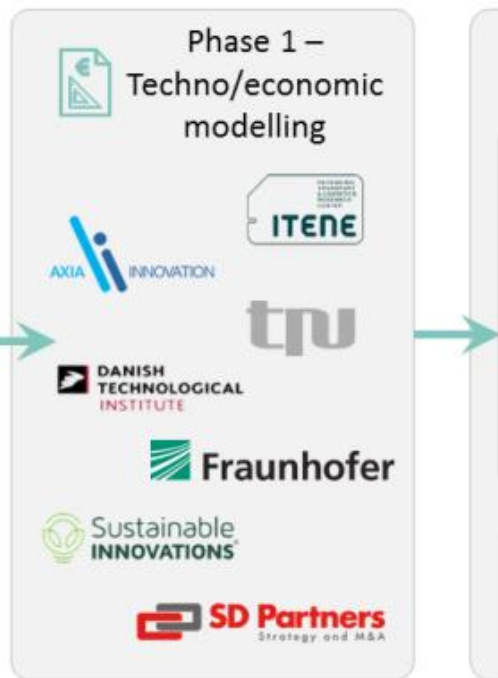
These services were built with the LEE BED's commercial partners and validated in an open, funded, competition. This ensured the services are relevant and work.



Phase 1 Services



SINGLE
ENTRY
POINT



Phase 1 provides relevant advice about your project meaning:

- Risks are identified and mitigated
- Opportunities are found and exploited
- You are directed to the correct experts

The output of the Phase 1 services helps you identify the size of your opportunity, where you should focus development and how to proceed with your idea.



Phase 3: Knowledge transfer



Phase 3 –
Knowledge
transfer

Sustainable
INNOVATIONS

SD Partners
Strategy and M&A

ITENE

AXIA
INNOVATION

The final, but critical, stage of LEE BED is knowledge transfer back to you the customer allowing you to act on the technology developed.

As both nanomaterials and printed electronics are highly innovative fields LEE BED provides expertise in:

- Current and emerging regulations and standards
- Current and emerging best practice in safe production and product life cycle
- The current IP landscape and best practice in knowledge management
- Defining viable business models and partnerships



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Phase 3: Knowledge transfer



This ensures LEE BED provides you with relevant information including:.

- Ensuring valuable IP is identified and protected and ownership is properly defined.
- Provide regulatory, standards compliance information relevant to the your product.
- Development of business plans and SWOT analysis for your products
- Provide venture capital services including financial advice, business plan optimisation, financial modelling, and investor opportunities to help you access private equity.

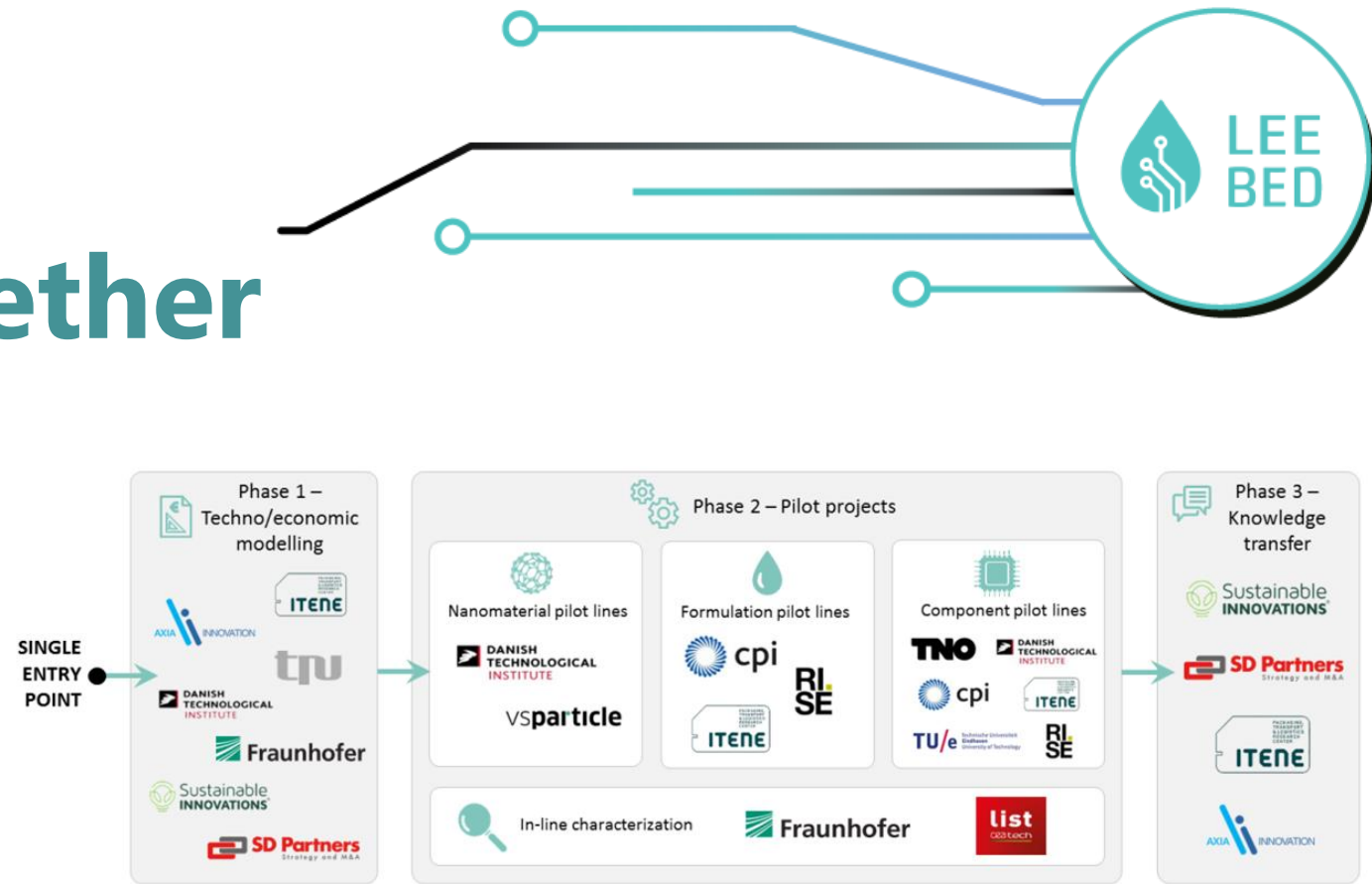


Bringing it all together

The strong commercial focus of LEE BED has aligned a diverse set of expertise and capabilities to create an end to end test bed to help de-risk innovation.

The starting point for this journey is the project Single Entry Point.

www.lee-bed.eu



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Visit LEE-BED and get
started today

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