Printed Electronics Helix Launch Event

21 September

REFORM

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COLLABORATION INTELLIGENCE

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Latest innovations in Green & printed electronics

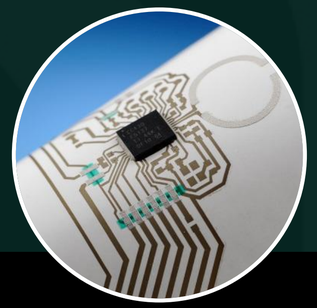
Maria Smolander, VTT Technical Research Centre of Finland

Environmental, social and economical sustainability of flexible electronics from design to disposal

Product ecodesign

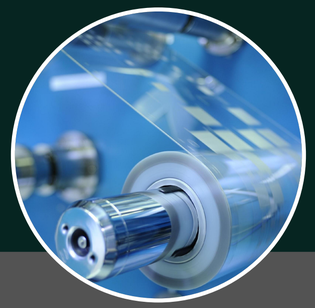
Modular products

Energy-autonomous smart labels



Sustainable materials

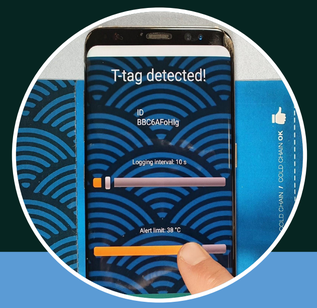
Renewable and abundant raw materials with end-of life compatibility



Energy-and resource efficient processes

Printing based additive manufacturing

Structural electronics



Sustainable usage & disposal

Sustainable usage e.g. for health & well-being Light-weight products

Feasible end-of-life scenarios

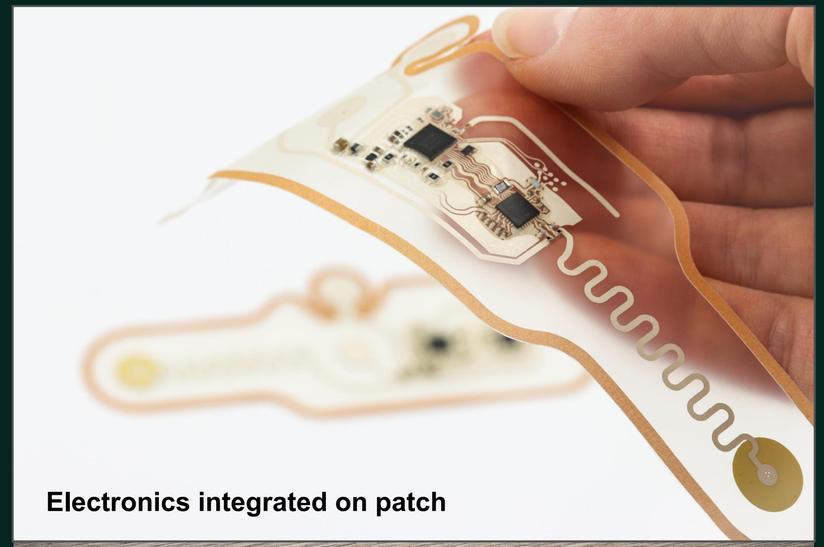
Nanocellulose based ECG patch

NANOCELLULOSE BASED SUBSTRATE

- renewable substrate material
- decreases microplastic release risk
- opens up new possibilities for disintegration

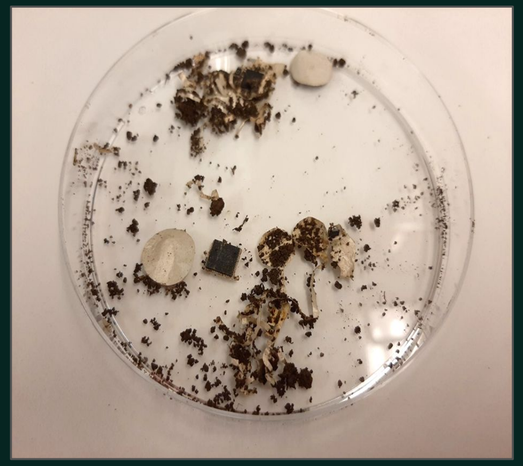
POSSIBILITY FOR MODULAR DESIGN

- simplifies disintegration
- enables partial re-use



Electronics integrated on patch

Modular design with reuseable electronic module

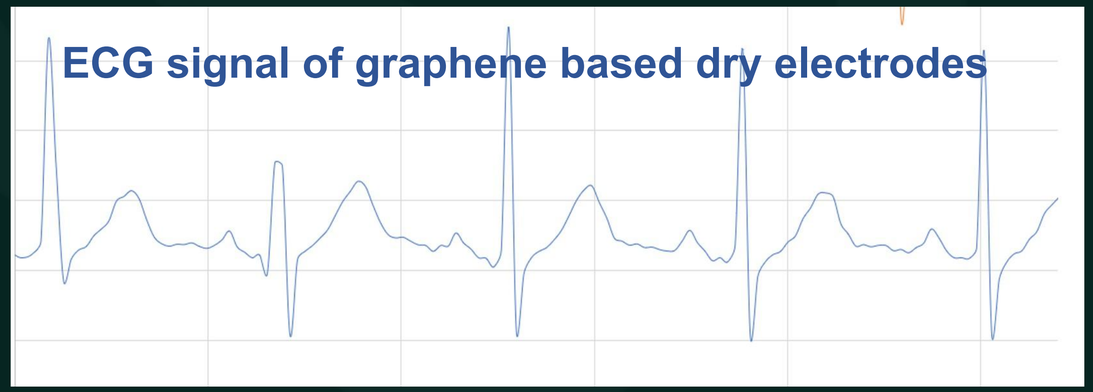


Substrate biodegradable in soil and water

Jaiswal, A. K. et al. *Adv. Electron. Mater.* 2023, 2201094. https://doi.org/10.1002/aelm.202201094

E-textile with dry electrodes

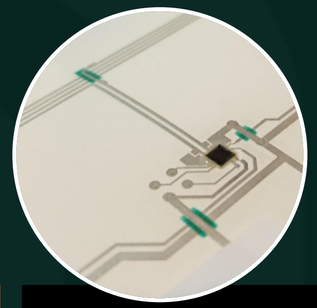
- T-shirt for wearable for ECG and EMG applications with fully printed washable and stretchable wiring
- Graphene based ECG electrodes eliminating the need for wet-gel application during the measurement
- Electronic module for ECG or ECG/EMG measurement and BT communication



Smart labels – contributing sustainability through efficient logistics

SUPERSMART

eit RawMaterials Connecting matters



ecotronics
Sustainable Electronics & Optics
www.ecotronics.fi

Anti-counterfeit label*

NFC powered

- Fully printed + NFC chip
- Electrochromic display
- Paper substrate

Temperature logger

Battery powered

- Thin battery
- Bare die chip with integrated temperature sensor
- Mobile app
- Paper substrate

Energy autonomous temperature logger*

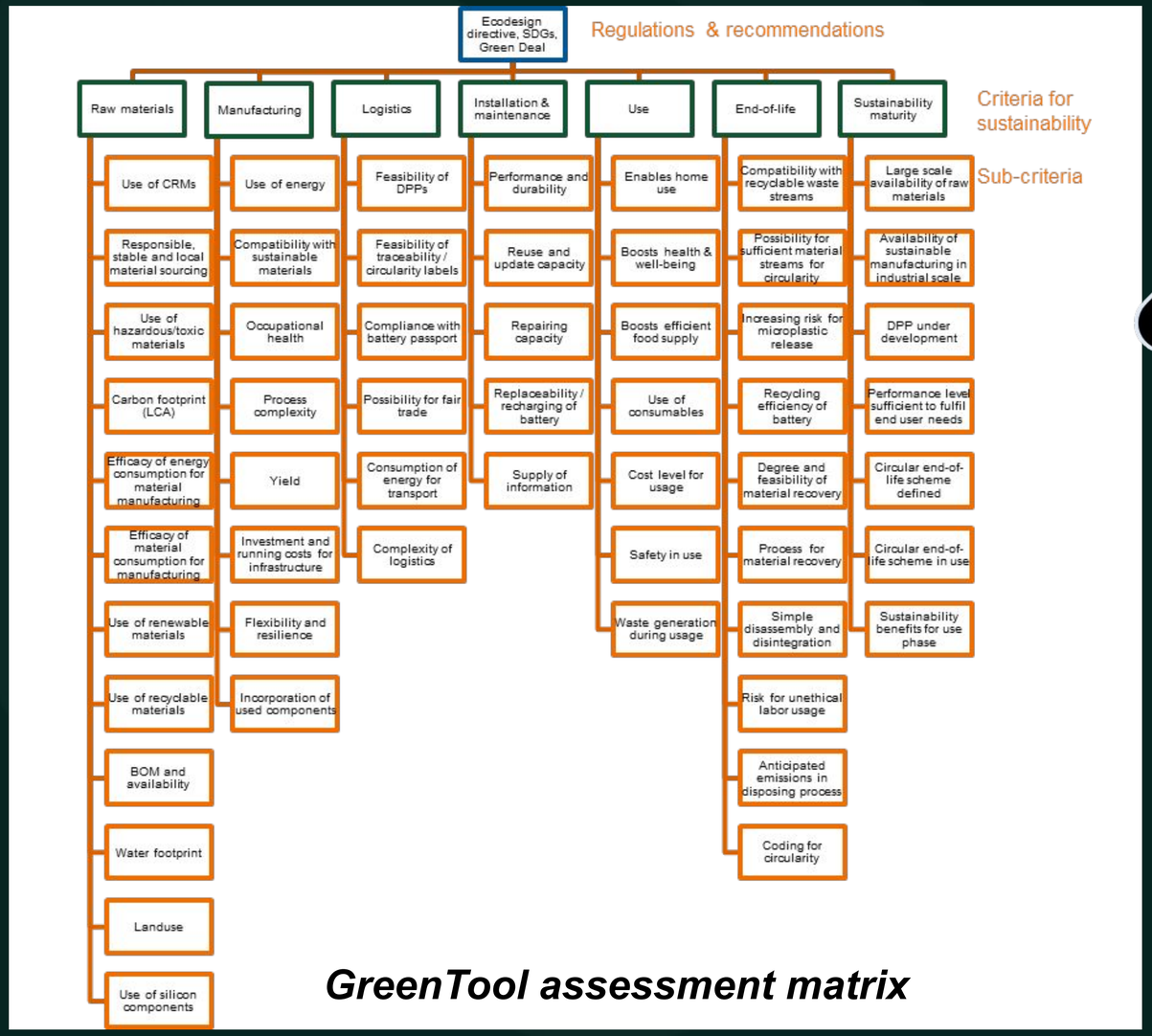
Energy harvesting

- Printed OPV and supercapacitors
- Bio-polymer substrate

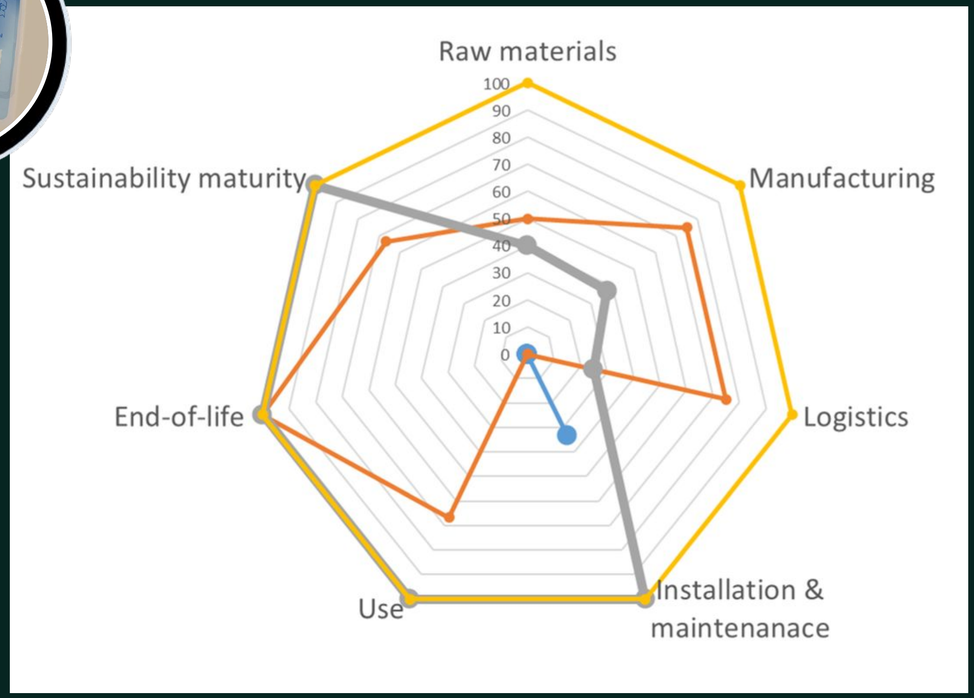
***Winners of the OE-A Competition 2021& 2022**
Best Publicly Funded Project Demonstrator

VTT

Tool for Qualitative Sustainability Assessment



GreenTool assessment matrix



Comparison of different temperature loggers from state-of-art logger (blue) to optimised energy autonomous printed label (yellow) revealed most remarkable differences btw the labels in raw materials

Hakola, L. . et al. Circ.Econ.Sust. (2023). https://doi.org/10.1007/s43615-023-00280-3