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DREAM TEAM

Dual-Robot Enhanced Additive Manufacturing with real Time Emulation for Adaptative control and Machine learning

F.Tholence RISE Research Institutes of Sweden


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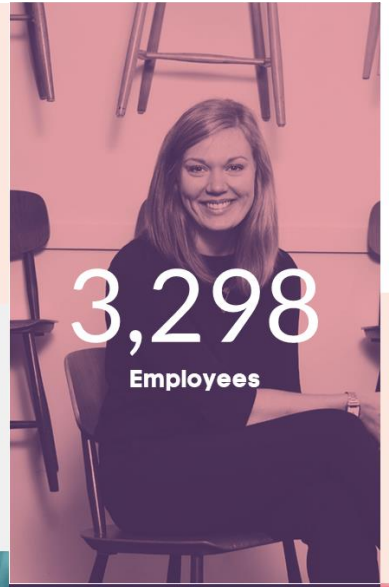
RISE Research Institutes of Sweden

4th

Sweden's most attractive employers in 2024

1st in Randstad employer brand research 2025



1236

Public funds **(MSEK)**

1,031

Scientific papers

2030

climate goals are SBTi approved

46%

Business sector revenue

130+

Demonstration and testbeds

41%

Women

78

Customer Satisfaction Index

Alla siffror avser 2023.

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Impact Innovation programme
Net Zero Industry 2040

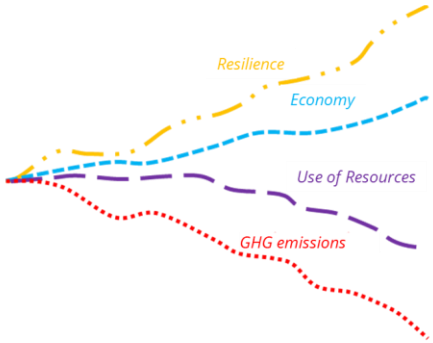
The Mission of this Impact Innovation programme is to achieve a Net Zero Industry by 2040 by accelerating the development of the Swedish manufacturing industry towards zero emissions leveraging two core enablers, increased **resource efficiency** and **resilience**.

2025

The industry contributes to significant greenhouse gas emissions

Economic growth drives resource use

The industry under pressure in a troubled world



2040

The industry enables net-zero greenhouse gas emissions

Economic growth decoupled from resource use

A resilient industry prepared for radically changing conditions

www.netzeroimpact.se/

Net Zero Industry
impact innovation

PROPOSAL INTRODUCTION (I)

Vision:
The goal of the project is the development and realization of a dual-robot Large Scale Additive Manufacturing (LSAM) pilot cell of polymer and biobased composites covering process simulation, robust AM manufacturing, closed loop process control based on real-time feedback and pre/post-treatment (e.g. milling, preheating). Although focussing on polymer, in a long-term perspective, the product is foreseen to be **scalable** across different **materials, technologies** and **industries**.

Motivation:
Large-Format Additive Manufacturing (LFAM) is experiencing significant market growth and is a promising enabler for **low cost, flexible, material tolerant and near zero waste technology sustainable and manufacturing** process in several industries and applications. The project aims to address key limitations that hinder the broader implementation of the technique in the industry.

Content:
The pilot cell should demonstrate the feasibility of:
1. Dual Robot LSAM pilot cell including optimisation and automation (scope: 3D printing and post processing)
2. Closed-loop control solution for LSAM based on real time monitoring and ML
3. Use of recycled material, while robust and reliable part manufacturing through process adaptation
4. Digital workflow and data collection for digital twin, ML and process traceability.

PROPOSAL INTRODUCTION (II)

Expected outcome:

The main deliverables of the project should be:

- A dual robot LFAM process line including printing and post processing
- First principle enhanced AI model for closed loop process control
- Digital dashboard for process follow up and traceability
- Cross industrial use case prototypes

Impacts:

Production: production time saving; increased process speed; process robustness, flexibility.
Sustainability: Near Zero waste manufacturing; Recycled content tolerant; localized and on-demand production;
Business: Time to market; shorter and circularity friendly value chain, improved traceability, reduced cost, more resilient.

Schedule:

Duration – 2-3 years Start-2027

PARTNERS

Current
RISE LSAM Test bed, first principle material model, Closed loop feedback expertise, Sustainability expertise…
Recycled raw material supplier
Sensors company

Partner search:
A coordinating partner

Partners in other areas within
Material compounding
AI expertise
Digital twin providers
System integrators
More end users

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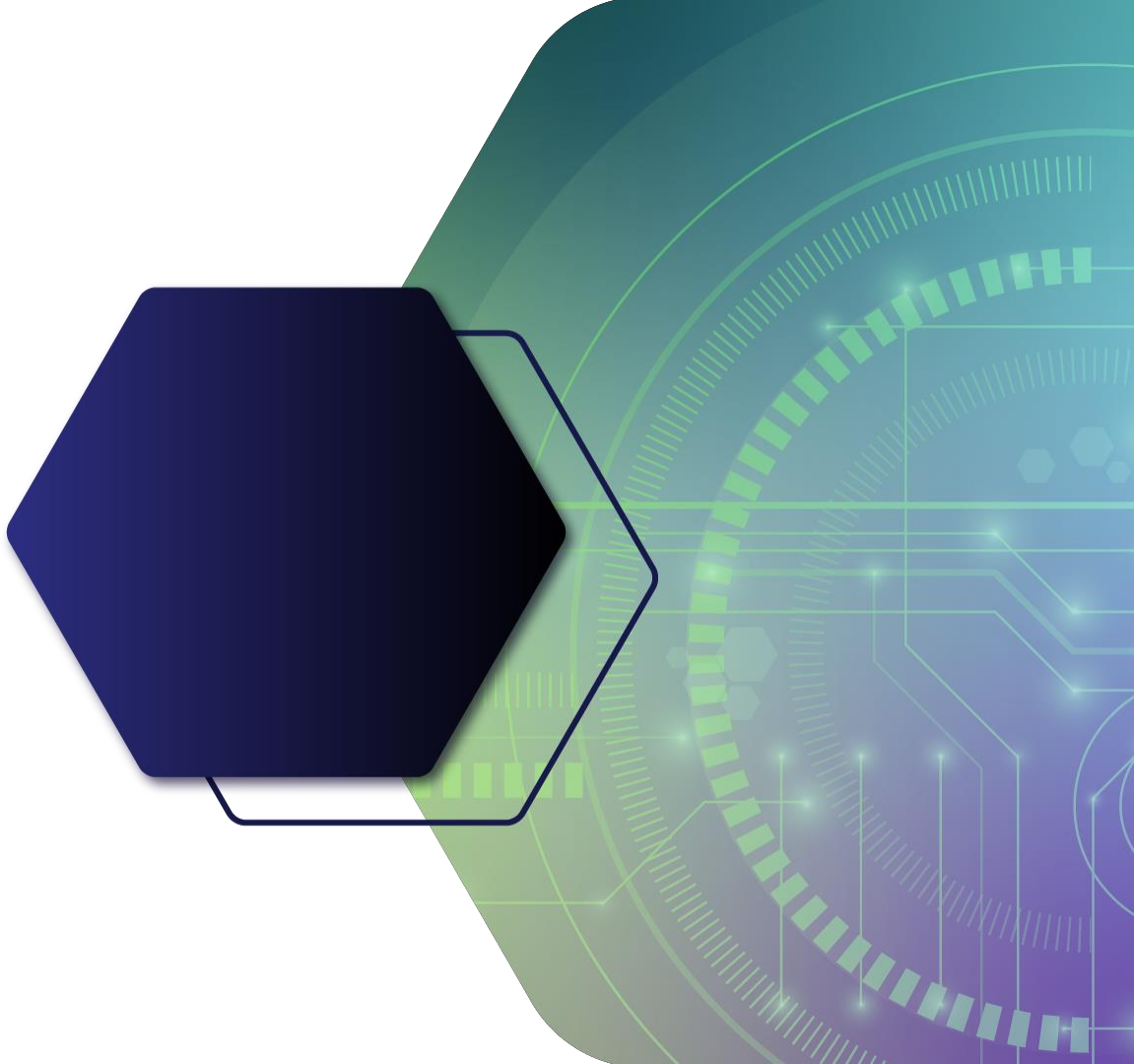

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