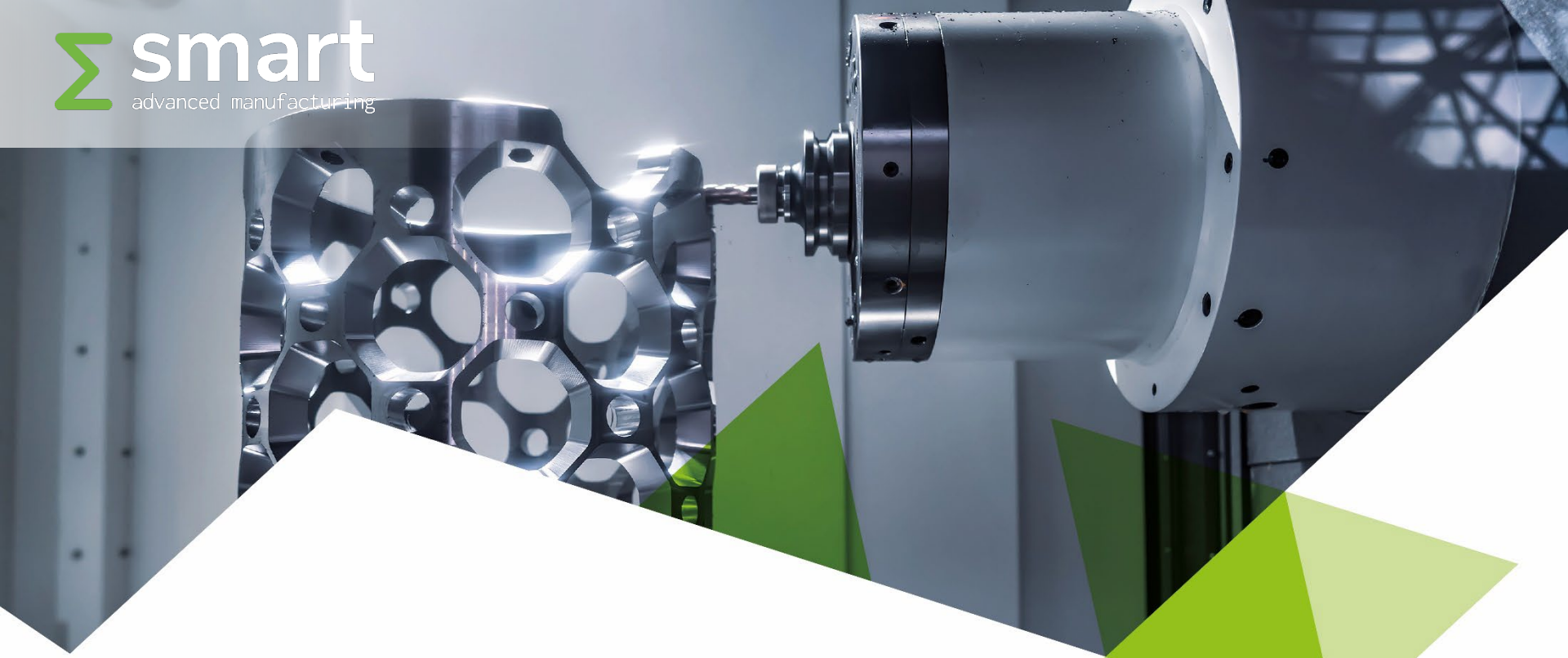
smart
advanced manufacturing



AI-assisted Manufacturability and sustainability


smart
advanced manufacturing

ORGANISATION PROFILE

Project partners in the consortium:

- University of Edinburgh
  - 2D&3D shape representation, recognition and classification, and generation
  - Machine Learning (ML) and Deep Learning (DL) developments for CAD/CAE-related tasks
- Lund University
  - Sustainable manufacturing and product development
  - Mechanical and structural optimization
  - ML and DL developments for mechanical analysis
- RISE (Research Institutes of Sweden)
  - Fluid dynamics
  - ML and DL developments for dynamical systems

PROPOSAL INTRODUCTION (I)

Vision: By mimicking nature's strategies and applying AI/ML algorithms, the project seeks to create bio-intelligent manufacturing systems that automatically optimize processes in real time.

Motivation: The manufacturing industry faces growing pressure to reduce its environmental impact, increase efficiency, and remain competitive in an evolving global market. By integrating artificial intelligence (AI) and machine learning (ML) with bio-inspired materials, structures, and processes, the project aims to advance production systems that are resource-efficient, adaptable, and aligned with the principles of the circular economy.

Content:
1. Enhance manufacturability by integrating AI/ML solutions with bio-intelligent materials and processes, addressing key constraints in areas such as castability, printability, forming, and hybrid joining.
2. Improve efficiency and cost-effectiveness by automating and optimizing manufacturing processes using AI-driven systems that can adjust production in real-time based on resource availability and operational conditions.
3. Reduce environmental impact through optimized resource use, emission reduction, and circular economy principles.

PROPOSAL INTRODUCTION (II)

Expected outcome: Scale bio-intelligent manufacturing technologies developed and validated from TRL 4 (lab validation) to TRL 6 (demonstration in a relevant industrial environment).

Impacts:

1. Enhanced manufacturability in manufacturing materials, structures and processes that can be applied to a broader range of products.
2. Augmented manufacturing efficiency and cost-effectiveness empowered by AI-based systems capable of optimisations under resource and time constraints.
3. Reduced environmental impact facilitated by AI-aided environmental impact software that can track, analyse, predict and optimise resource use and system emission aligned with circular economy principles.

Schedule: TBD

PARTNERS

Current:

❖ Academic institutes:
University of Edinburgh
Lund University
RISE (Sweden Research Institute)

❖ Industrial partners:
1. Automotive sector (Including Volvo Cars)
2. Gas turbine manufacturers
3. Power electronics manufacturers

Partner search:
- ❖ Automotive Consortia concentrating on reducing emissions and integrating sustainable technologies into vehicle production.
- ❖ Energy Sector Initiatives working on optimisations for better resource efficiency and lower environmental impact.
- ❖ SME Networks that specialize in rapid innovation cycles.
- ❖ Research Initiatives aligning with Horizon Europe framework focusing on sustainable manufacturing, AI/ML integration, and the circular economy.

CONTACT INFO

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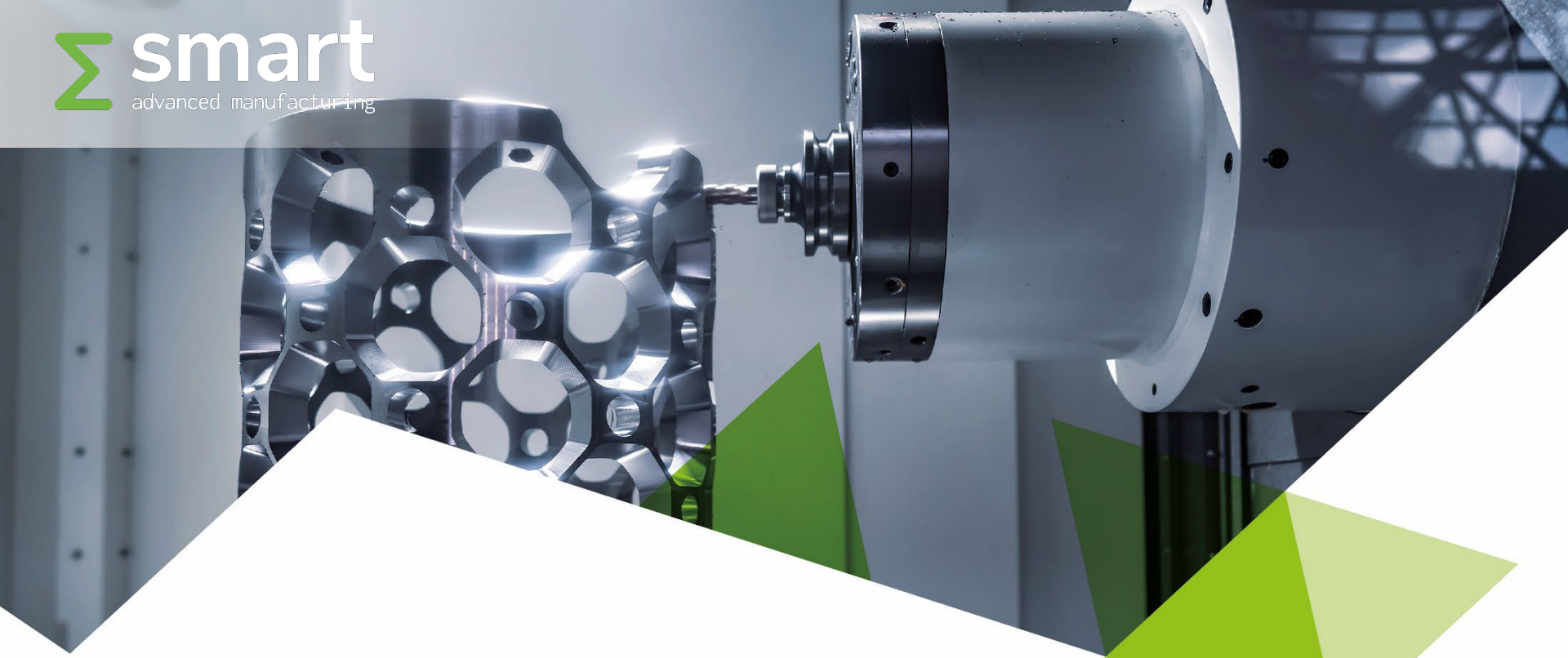

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