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Manufacturing
Technology Centre

MTC FoF Projects:

- **AMAZE**

- ENCOMPASS

- OPENHYBRID

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Manufacturing
Technology Centre

National Centre Additive Manufacturing





▶ Additive Manufacturing Aiming Towards Zero Waste and Efficient Production of High –Tech Metal Parts

▶ Duration: 4.5 years (from Jan 2013)

▶ €18m project (€10m EU funding plus partner contribution)

▶ FP7 (FoF-NMP.2012-4 high performance manufacturing technologies in terms of efficiency)

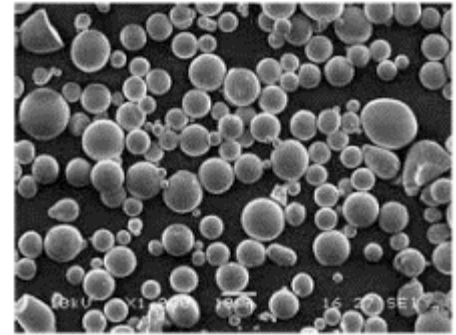
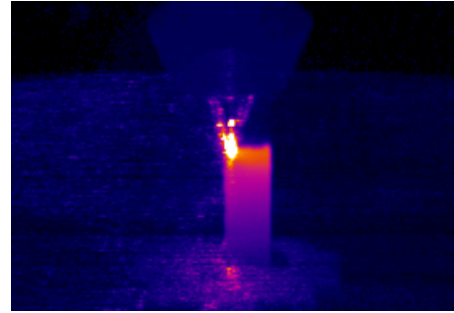
▶ 28 Partners



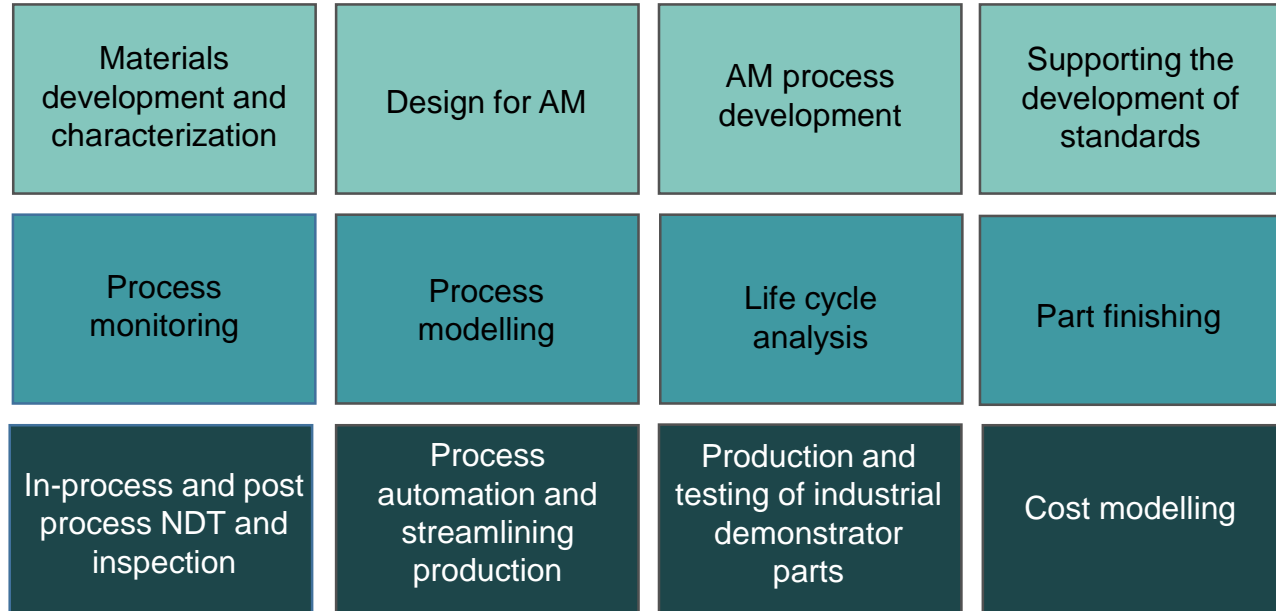
Aim of AMAZE

Develop and demonstrate metal AM process chains for industrial production

- ▶ Robust AM process chain for small to large parts
- ▶ Industrial scale parts which have been tested
- ▶ Demonstration AM production factories



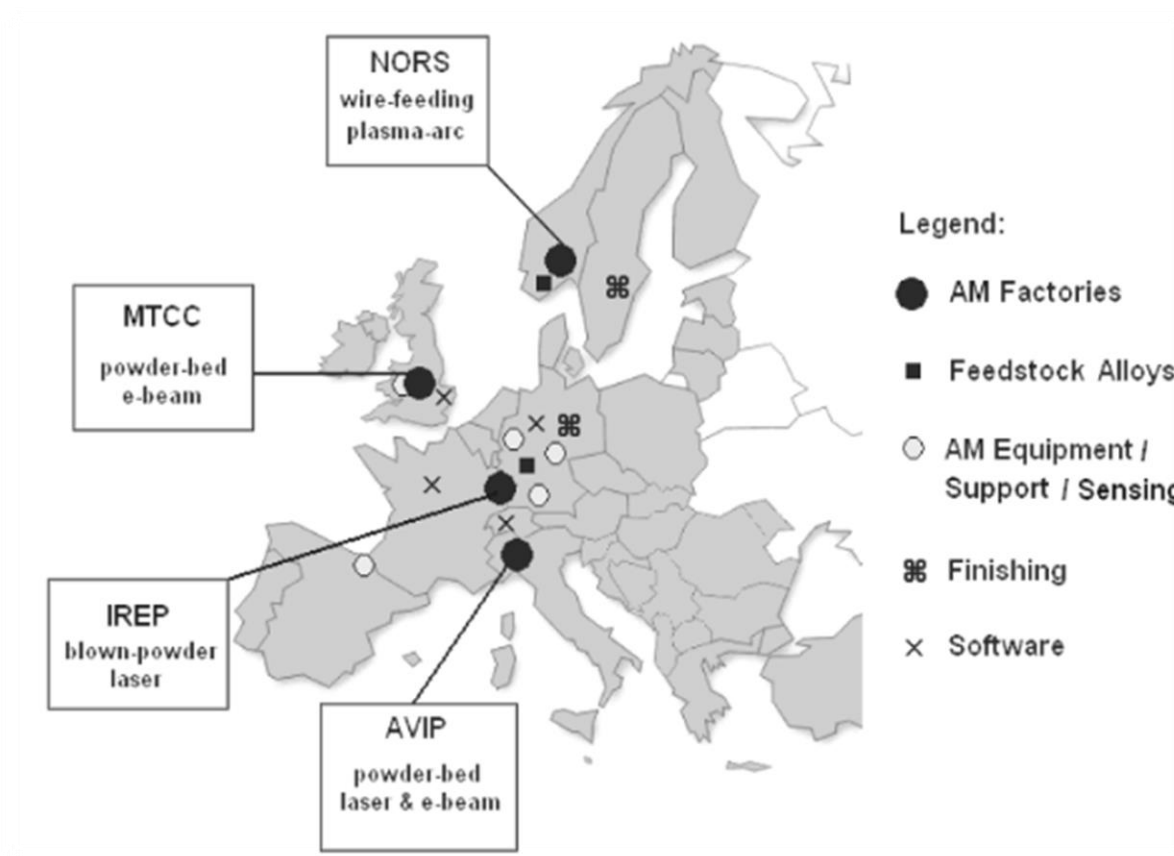
End-to-end Approach



Existing / expected results

	Completed characterisation of material feed-stock	Benchmarked AM processes	Process development completed – multi-heat source	Feed-stock characterisation	
Significant material test program complete	Materials development and characterization	Design for AM	AM process development	Supporting the development of standards	Development of NDT methods Test artefact for benchmarking
Non-contact in-process NDT developed for DED	Process monitoring	Process modelling	Life cycle analysis	Part finishing	Developed range of novel finishing techniques including laser polishing
Part defects characterised	In-process and post process NDT and inspection	Process automation and streamlining production	Production and testing of industrial demonstrator parts	Cost modelling	
	Effectiveness of NDT methods are being assessed	AM factories have been designed – need to be tested	Parts selected and resigned for AM. Part production underway	Provide validated benefit for new process compared to conventional	

Demonstration AM Factories



ENCOMPASS (ENgineering COMPASS)



EUROPEAN UNION

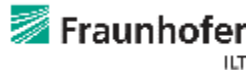


PHOTONICS21



FoF
Futurism of the Future
The Accelerator

- ▶ Duration: 3 years, Value: €4m
- ▶ Call: H2020 FoF13 – 2016
Photonics Laser-based production



Rolls-Royce



ENCOMPASS

DIGITAL INTEGRATED DESIGN DECISION SUPPORT SYSTEM

Aim: Create a fully digital integrated design decision support (IDDS) system to cover the whole manufacturing chain for a laser powder bed fusion (L-PBF).

Steps themselves also being optimised to improve the capability and efficiency of the overall manufacturing chain.

OPENHYBRID



- ▶ Duration: 3 years, Value: €6.5m
- ▶ Call: H2020 FoF1 – 2016
Novel hybrid approaches for additive and subtractive manufacturing machines

Aim: To develop a large scale hybrid AM platform for the efficient production of fully finished metallic parts.

Solution based on:

- High power laser + power and wire feed stock
- Integrated tool changeable deposition head fitted to 5 axis milling machine – small to medium sized parts
- Gantry style platform for large scale parts



SIEMENS



GÜDEL



+GF+



BCT.



HYBRID
MANUFACTURING
TECHNOLOGIES



CENTRO
RICERCA
FIAT



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