Additive Manufacturing Research and Innovation actions managed by INEA (Innovation and Networks Executive Agency)

EASA Additive Manufacturing Workshop

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Innovation and Networks Executive Agency

European Commission

INEA: part of EU Aviation R&I family

European Commission

INEA : Making implementation happen!

- **Ten years of experience**: **now managing close to 1,500 projects**
- **Budget managed 2014-2020: € 34 billion**
- **Connecting Europe Facility, Horizon 2020 Transport and Energy**
- **With around 230 expert staff of 27 different nationalities**
- **Aiming to**: support applicants, improve/speed-up procedures, use high-quality evaluators, follow up implementation, create partnerships with beneficiaries, increase visibility, give feedback for policymaking to the Commission
- **Ensuring 100% respect of deadlines**

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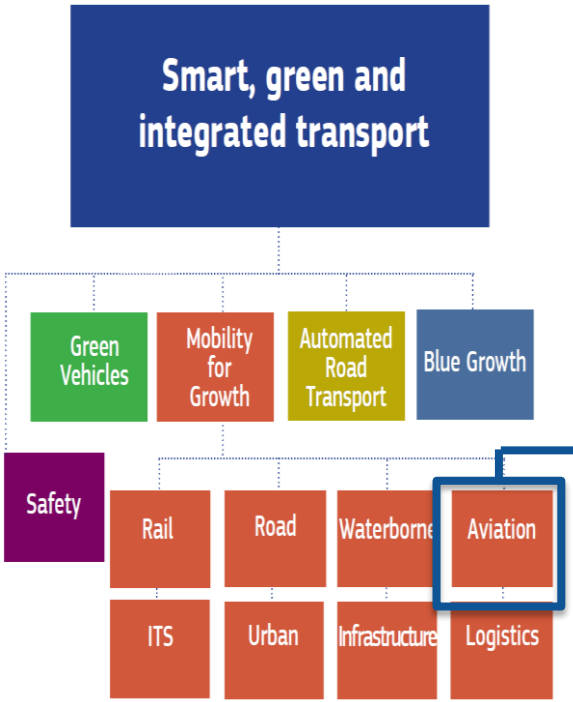
H2020 : Smart, green and integrated Transport



2014-2017 Transport € 1 billion EU contribution

€ 215 million
for **Aviation**

- Cost efficiency
- Resource efficiency
- Seamless mobility
- Safety
- Breakthrough innovation
- Skills and knowledge
- Reducing aviation noise
- International cooperation

45 ongoing projects
3 new starting end 2017

AM Projects managed by INEA

Five additive manufacturing projects, total EU contribution € 20.25 million :

- **MMTech** (mmtech-nology.com)
- **AMOS** (http://amos-project.com)
- **EMUSIC** (birmingham.ac.uk/generic/emusic/index.aspx)
- **Bionic Aircraft** (www.bionic-aircraft.eu)
- **NHYTE** (www.nhyte-h2020.eu)

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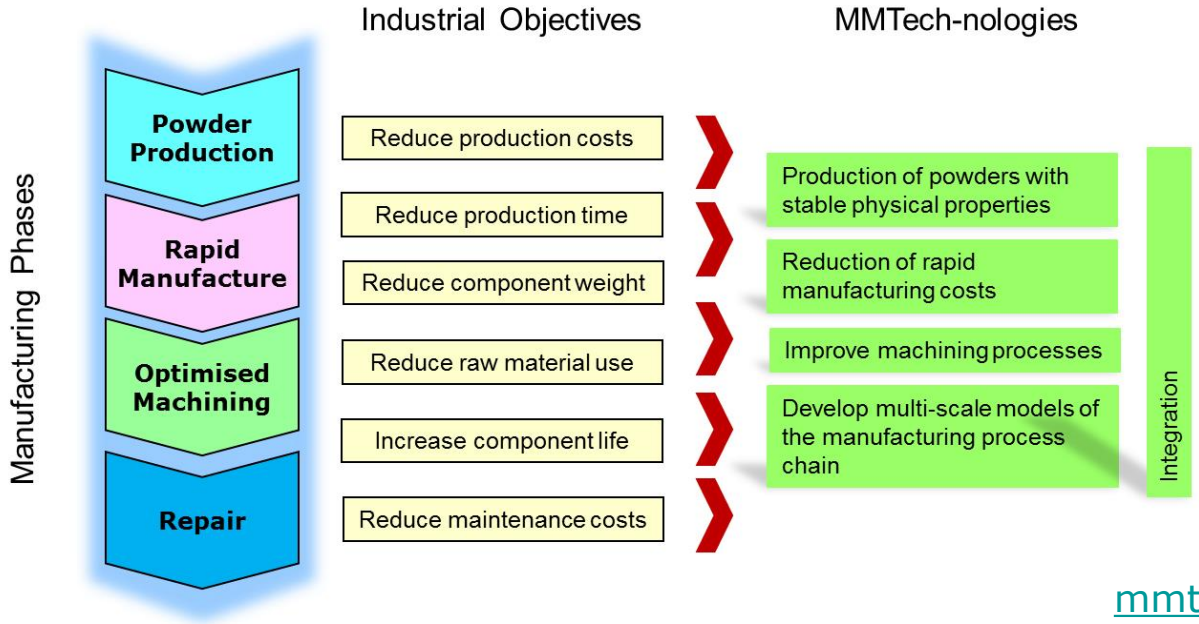
MMTECH
Innovative manufacturing for gamma titanium aluminide

New aerospace advanced cost effective materials and rapid manufacturing technologies

Objectives: MMTech will focus on sustainable introduction of γ-TiAl (Gamma titanium aluminides) into aerospace applications



mmtech-nology.com

Start: May 2015 (48 Months). **Budget (EU Contribution):** 5.7M€.
Coordinator: University of Sheffield. 13 participants from UK, France, Spain and Italy.
Review Meeting date: Nov'2016 and May'2018. **End-project TRL:** TRL 4-6

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AMOS
Additive repair for aerospace

Additive Manufacturing Optimization and Simulation Platform for repairing and remanufacturing of aerospace components

http://amos-project.com

Main Objectives

- Project focuses on several key **Direct Energy Deposition (DED)** AM processes.
- DED systems offer flexible and have great potential to be used as **cost-effective and efficient repairing and re-manufacturing scenarios for aerospace components** such as turbine blades and landing gears.
- **Damaged components can be repaired** (on-demand) and material lost in service can also be re-deposited to restore the component to its original shape. This approach has the potential to **reduce lead times, costs, material waste and extend the service life** of damaged or worn components.

Start: February 2016 (48 Months) **Budget (EU Contribution):** 1.4M€
Coordinator: University of Sheffield.
4 participants from UK, France and Sweden + 5 participants from Canada.
Review Meeting date: March 2019. **End-project TRL:** TRL 2-4

European Commission

EMUSIC

Efficient Manufacturing for Aerospace Components USing Additive Manufacturing, Net Shape HIP and Investment Casting

http://www.birmingham.ac.uk/generic/emusic/index.aspx

Objectives

→ To develop the **manufacturing processes for components** specified by aerospace companies both in **China** and in **Europe**, in three areas:

- **Additive Manufacturing (AM)**
- **Near Net Shape HIPping (NNSHIP)**
- **Investment Casting (IC)**

→ To implement **demonstrators which can be manufactured and assessed by partners and end-users,** during the final 6 months.

→ The cost of the process route for components will be provided to the end-users and this, together with their assessment of the quality of these products, will allow the end-users to decide whether to **transfer the technologies to their supply chain.**

Start: April 2016 (36 Months). **Budget (EU Contribution):** 1.8M€.
Coordinator: University of Birmingham.11 participants from UK, Germany, France, Spain and Switzerland + 7 participants from China.
Review Meeting date: October 2017. **End-project TRL:** TRL 4-5

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BIONIC AIRCRAFT

Increasing resource efficiency of aviation through implementation of ALM technology and bionic design in all stages of an aircraft life cycle

Objectives

http://www.bionic-aircraft.eu

Increasing efficiency of an aircraft by implementing Additive Manufacturing in all stages of an aircraft life cycle:

- **During Manufacturing:**
  due to resource efficient production by Additive Manufacturing Technology
- **During Operation:**
  by significant weight saving (>30 % of structural components) due to bionic lightweight design
- **In Maintenance, Overhaul and Repair:**
  due to innovative repair methods for AM components
- **In Recycling:**
  by development of new recycling methods for AM material

Resource Efficiency in BionicAircraft

Start: Sept 2016 (36 Months). **Budget (EU Contribution):** 6.4M€.
Coordinator: LZN Laser Zentrum Nord. 10 participants from Germany, UK, France, Spain, Switzerland and Italy. **Review Meeting date:** March 2018. **End-project TRL:** TRL 4-6.

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www.nhyte-h2020.eu

New Hybrid Thermoplastic Composite Aerostructures manufactured by Out of Autoclave Continuous Automated Technologies

Objectives

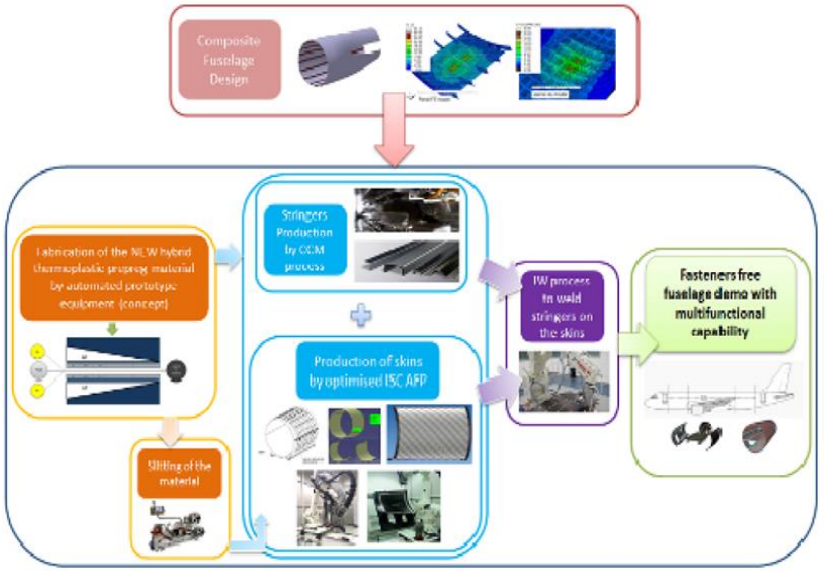
Concepts and methodologies enabling the innovative and **green** integrated aero-structures made by a new **recyclable** hybrid thermoplastic composite material with **multifunctional** capabilities.

New hybrid material fabricated by an innovative machine implementing a continuous automated production process.

Typical aero-structures (part of wing and fuselage) will be produced by robotic machines using new processes as **Automated Fiber Placement** (AFP), **Continuous Forming** and by **Induction Welding,** like in automotive industry.

Proof of Concept :

Manufacturing of a Fuselage portion Demostrator



Start: May 2017 (36 Months). **Budget:** 5.2M€.
Coordinator: NOVOTECH Aerospace Advanced Technology (Italy). 8 participants from Italy, Greece, Belgium, France, Spain and UK. **Review Meeting date:** November 2018. **End-project TRL:** TRL 6.

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For more information

inea@ec.europa.eu

https://ec.europa.eu/inea/en/horizon-2020/h2020-transport/projects-by-field/aviation

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Look for INEA!