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## OBJECTIVES

- **Design guidelines** for lightweight Aluminium Additive Layer Manufactured (ALM) parts
- Automated **Bionic** Lightweight Design Process
- New high-strength ALM **Aluminium alloys**
- Highly productive ALM process with innovative **beam shaping** optics
- Integrity system for **complex ALM parts**
- Innovative **non-destructive-test methods** and repair **concepts**
- Innovative ALM-based **after-sales supply chain**
- **Recycling** for ALM parts and “out of specification” powder

## RESOURCE EFFICIENCY CYCLE



### During manufacturing

- Increase of capture efficiency for ALM powder production for aluminium by 30%

### During operation

- Reduction of emissions due to average weight reduction of >30% for structural optimized ALM components

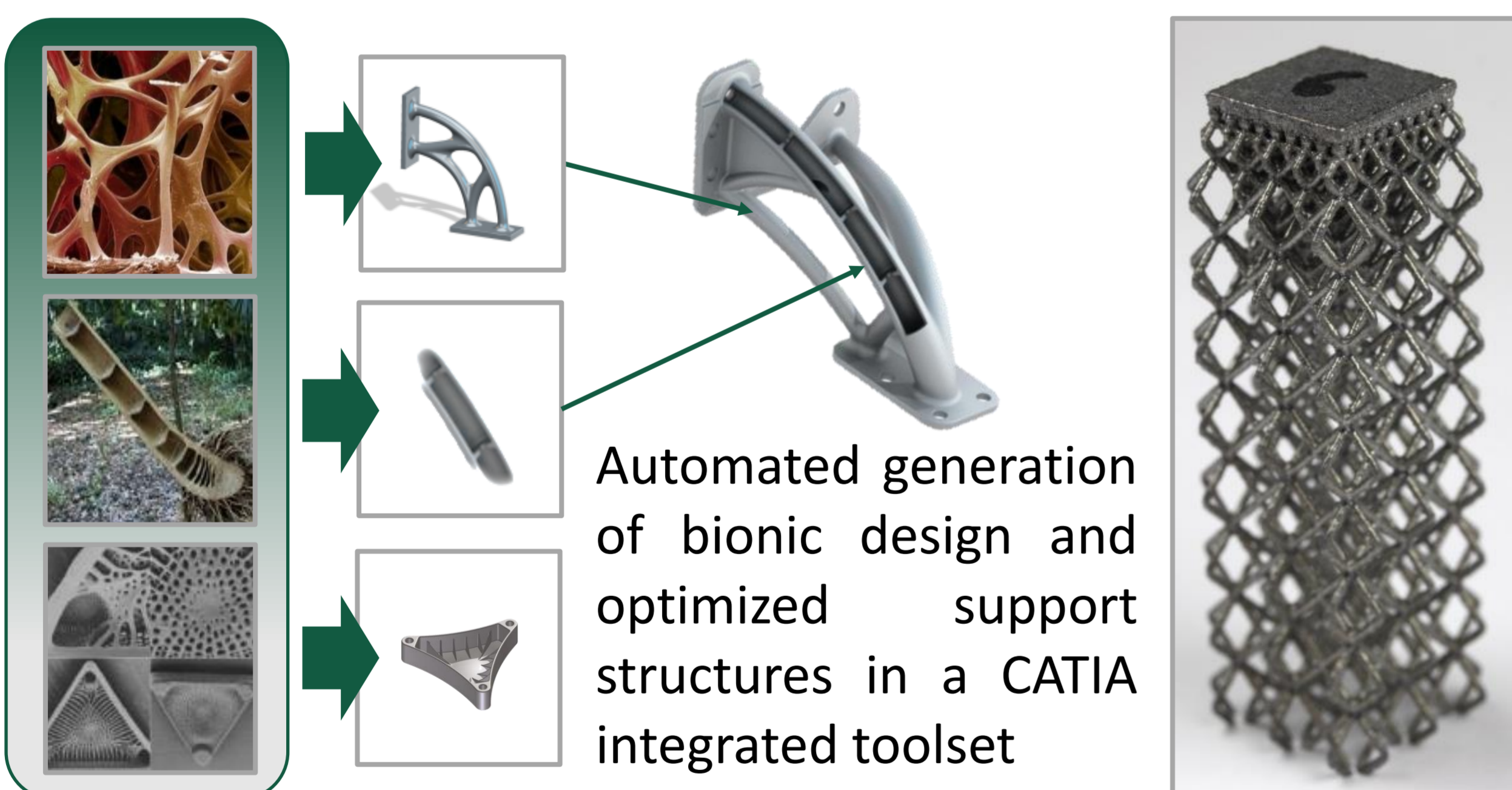
### In maintenance

- Repair methods for ALM components which increase service life up to 50%
- Determination of efficient after-sales supply chains

### In recycling

- Increase recycling rate for ALM parts to 95% due to development of an efficient recycling method

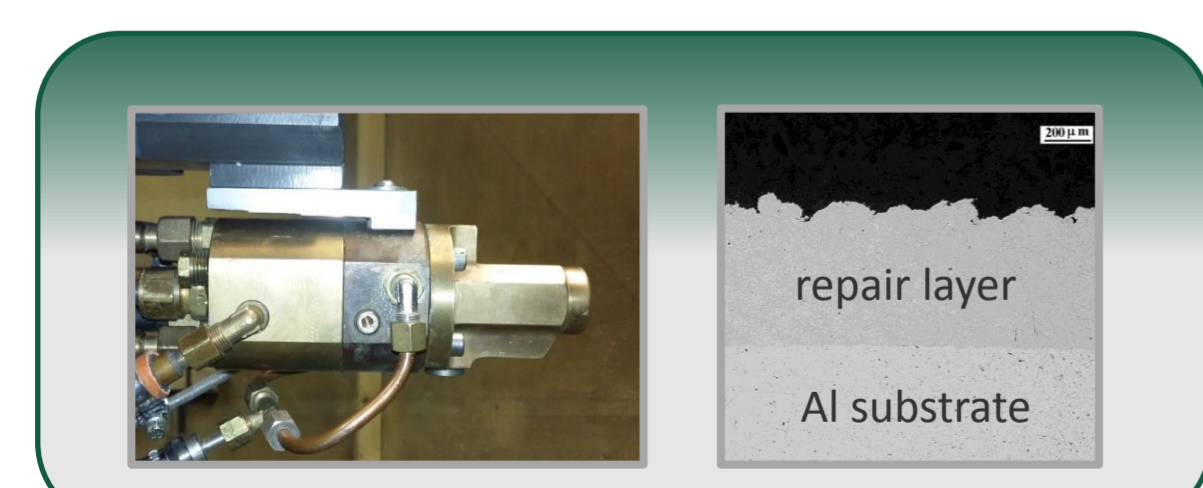
## BIONIC DESIGN



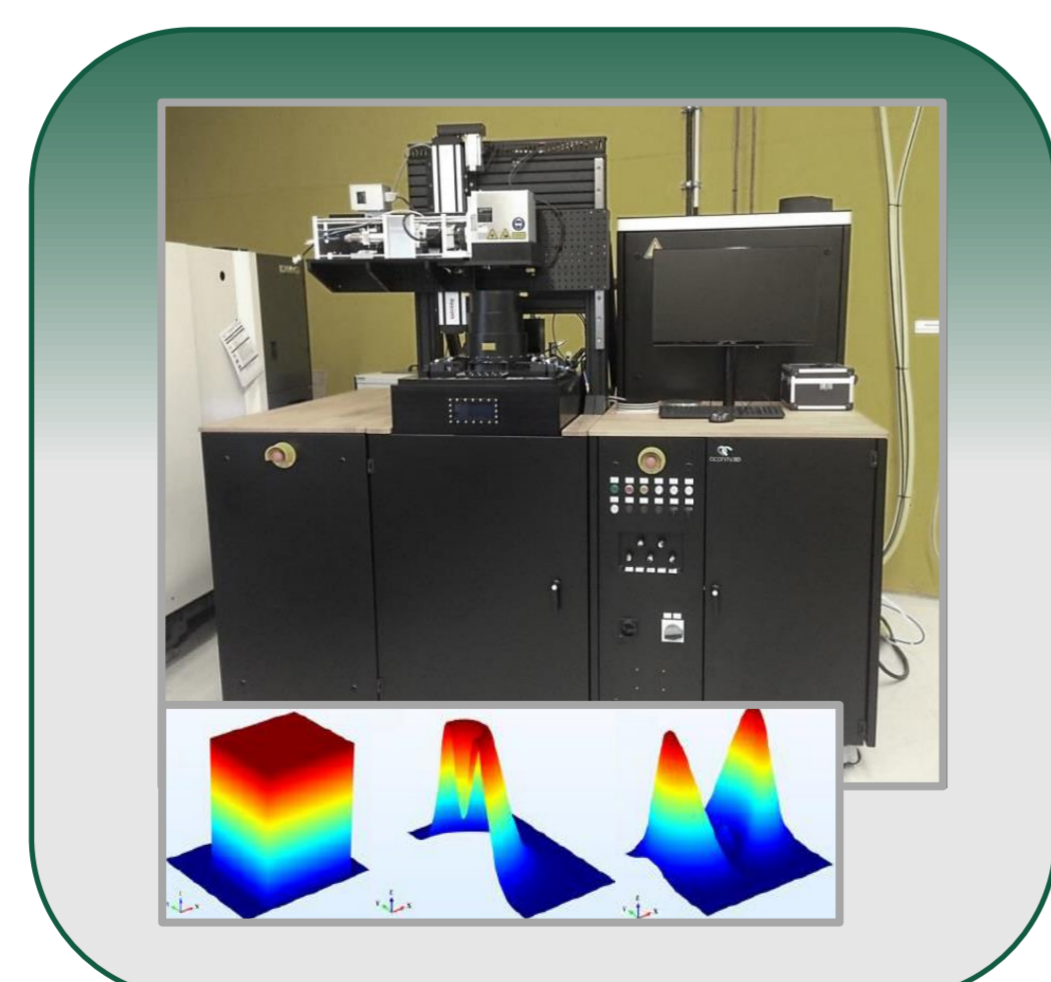
## HIGH-STRENGTH MATERIALS

- ### New high-strength Al-Li alloys
- Innovative Al-Si-Sc and Al-Li-based materials
- maximum lightweight potential
  - excellent processability
  - excellent corrosion resistance
  - high-temperature resistance
  - high stiffness
- for weight reduction and an optimized lightweight design

## INNOVATIVE AM PROCESSES



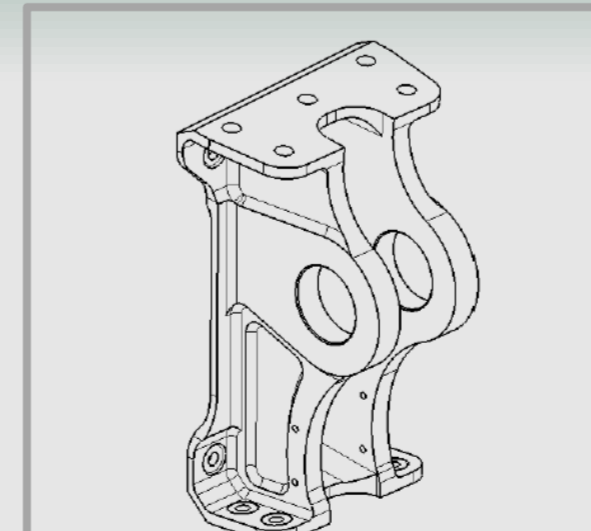
- Repair processes :
- thermal spray process (TS)
  - laser metal deposition (LMD)



LBM with optimized laser beam shapes

## VALIDATION

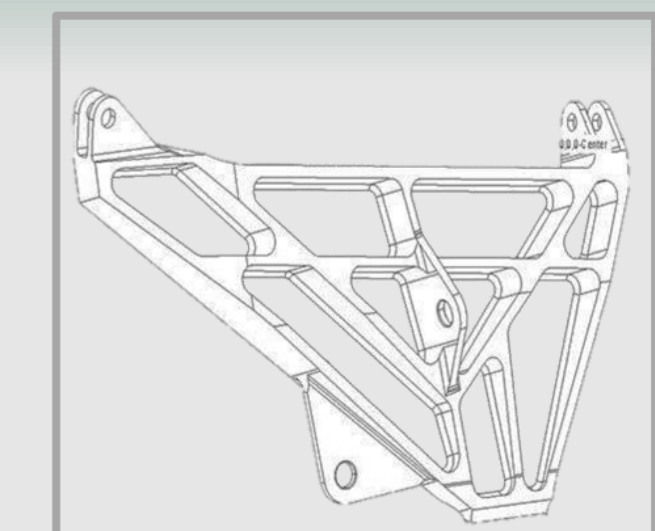
**Demonstrator 1:**  
A330NEO Jack Actuator Bracket



**Demonstrator 2:**  
A340 Hydraulic Block



**Demonstrator 3:**  
A350XWB T-Mount Fitting



## CONSORTIUM

