



EMPOWERING THE FUTURE

3T Additive Manufacturing

Part of the BEAMIT GROUP

3T

Part of the
BEAMIT GROUP



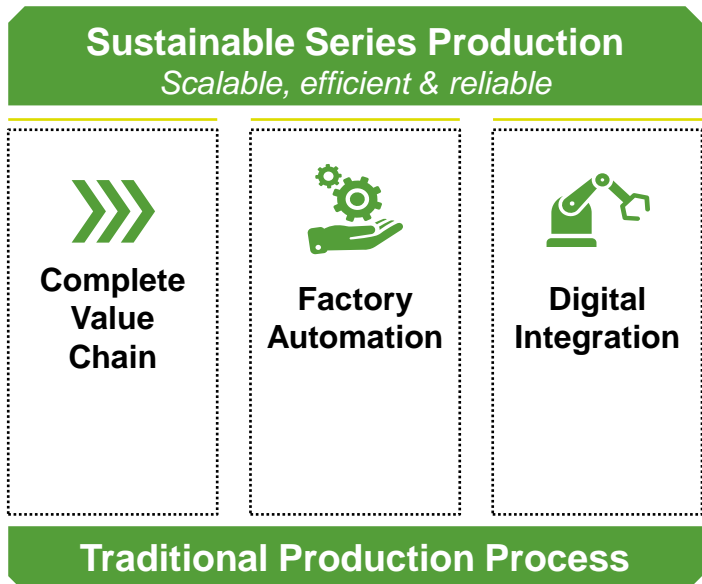


MISSION

NET ZERO MANUFACTURING AT COMPONENT LEVEL BY 2032

3T-AM today:

Advanced and digitally integrated production system, helping OEM customers to meet new sustainability legislation and targets



Looking forward:

Strategy to become a **€150m net-zero digital manufacturing leader** by 2032, at the forefront of innovation:



Environmental certification

Deployment of an environmental management system to obtain ISO 14001



Entire green production chain

Enable 3T-AM to give all components produced an energy rating



Renewable energy

100% of energy to be obtained from renewable sources



Digital Factory

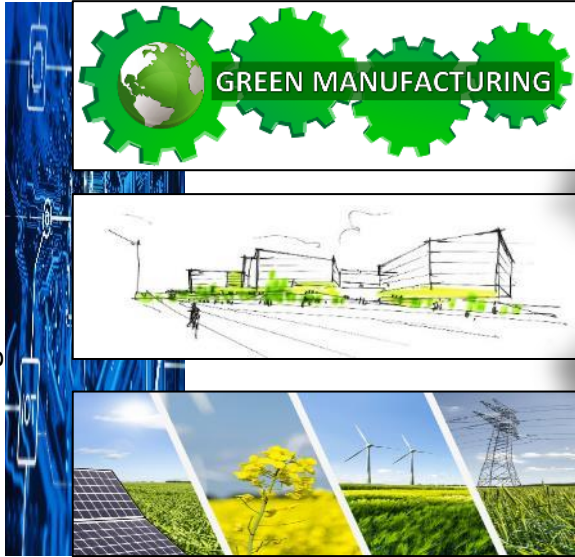
3T-AM target is to establish a low-emission digital factory for an aerospace component service provider

PLAN FOR FACTORY OF THE FUTURE

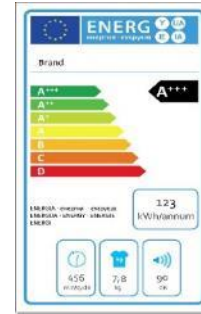
INTEGRATED ENERGY, CONSTRUCTION AND PROCESSES



Digital Thread



- Green Manufacturing Processes
- Sustainable Factory Design
- Renewable Energy



Components produced can be measured and given an energy rating

- An integrated factory is required to ensure sustainability and lean manufacturing targets are achieved
- Government engagement to create a real 'Factory of the Future' to leverage the lowest carbon component manufacturing service company.



OUR JOURNEY TO NET ZERO



2021-
2023

2024

2025

2026-
2032

STABALISE

- New business model
- New Org structure
- Foster desired culture
- Reduce cost base
- 100% Renewable Energy



MEASURE

- Energy monitoring& analysis dashboards and machine level sensors
- Digital testbed for £150m facility, simulating total energy – Q3,24
- Legislation - development with carbon accounting tools + carbon trust – Q3,24
- Digital & automation roadmaps – Q3,24
- Energy efficiency & decarbonization roadmap – Q3,24
- Funding / investment for new net zero facility – Q4,24



REDUCE

Implementation of:

- Reusing wasted process energy – starts Q1,25
- Data driven process energy reduction plan.
- Digitalization of the 'factory level manufacturing system' – starts Q2,25
- Automation of the end to end value stream – starts Q4,25
- LCA analysis from mining to delivered components for Forging/casting/billet/fabrication/ AM

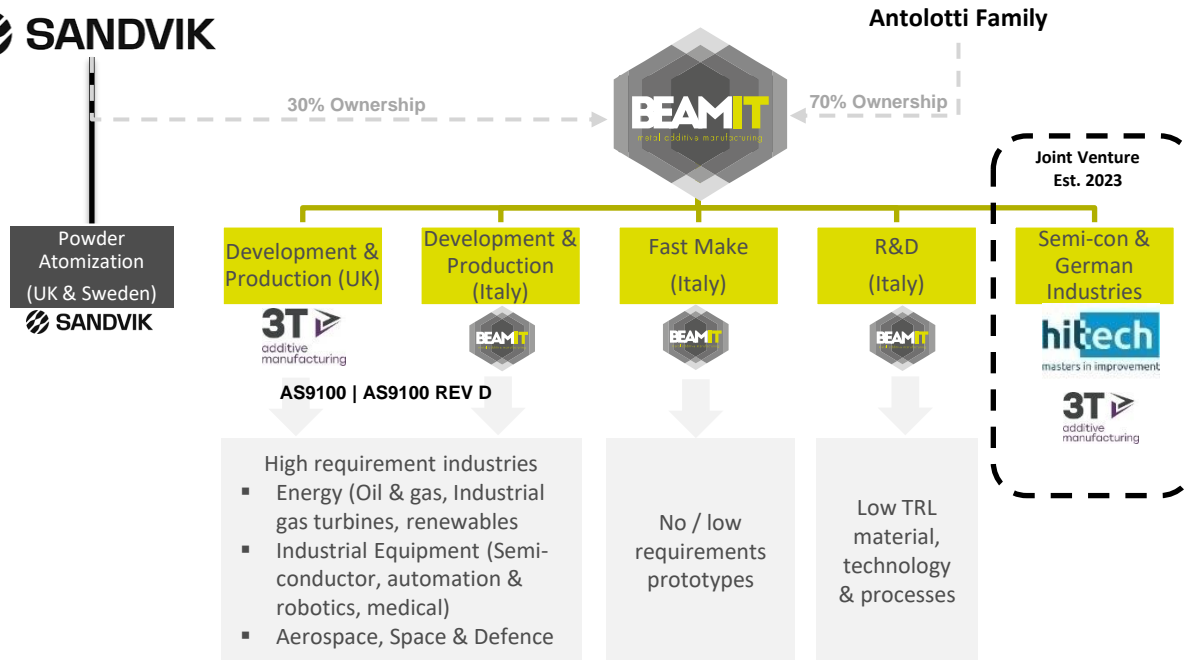
CONSOLIDATE & BUILD

- 2028 - Net Zero facility comprehensive plan
- 2029 – Accreditations inc BREEAM / ISO14001
- 2029 – Full component and company LCA analysis & reporting
- 203 – Net zero facility fully operational
- 2032 – Net-zero parts
- 2032 – carbon offset credits (carbon capture – net negative)

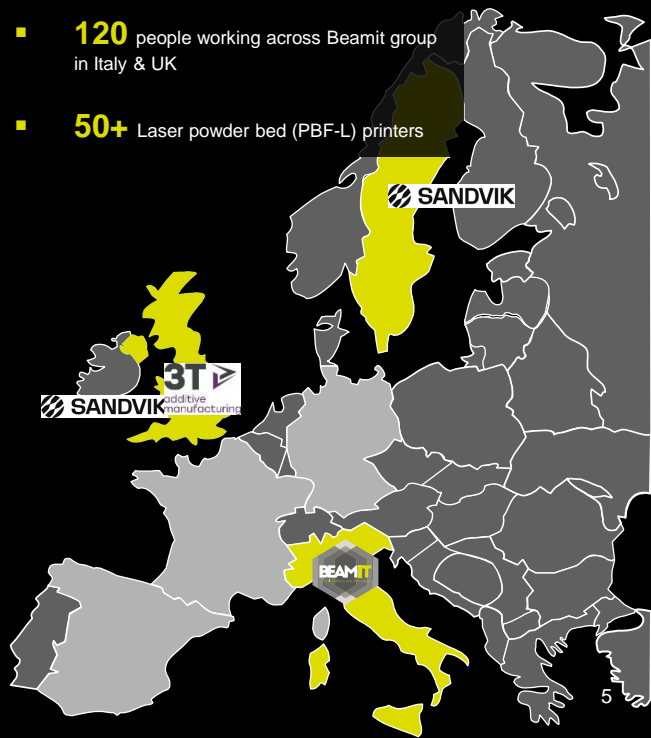


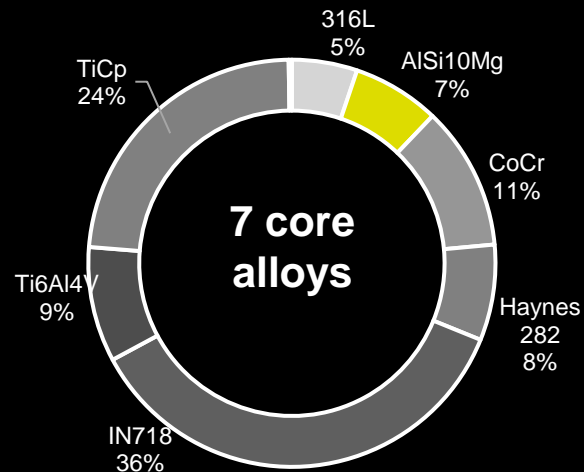
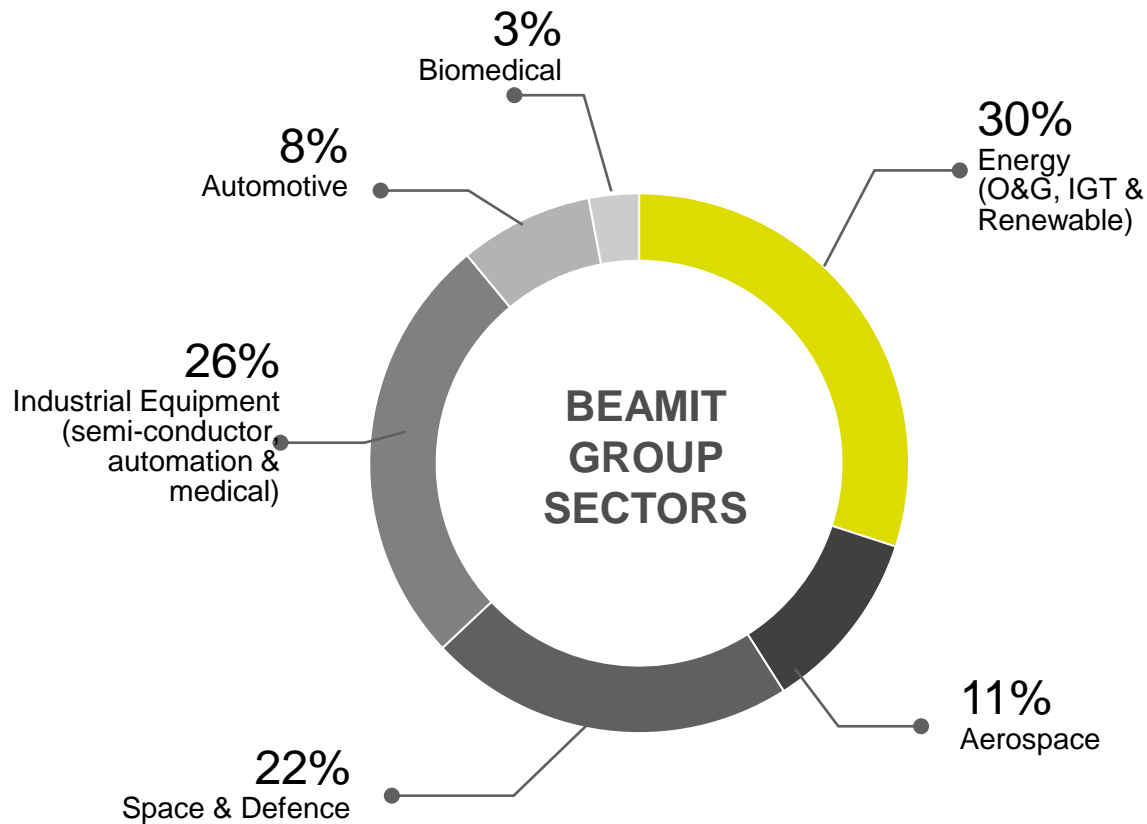
THE BEAMIT GROUP

FIVE DIVISIONS, ONE VISION FOR ADVANCED & SUSTAINABLE MANUFACTURING



- **112,332 MSEK** Sandvik revenue in 2022 (£8.4Bn)
- **€20m** Beamit group revenue in 2022.
- **120** people working across Beamit group in Italy & UK
- **50+** Laser powder bed (PBF-L) printers





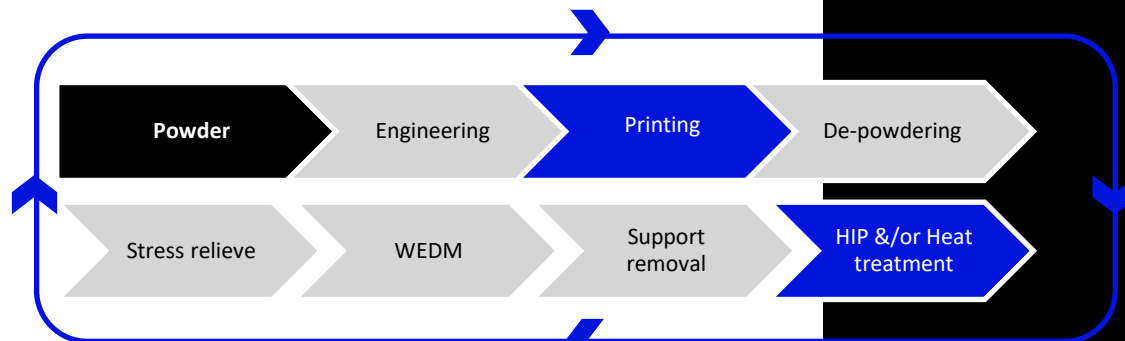


GROUP CAPABILITY

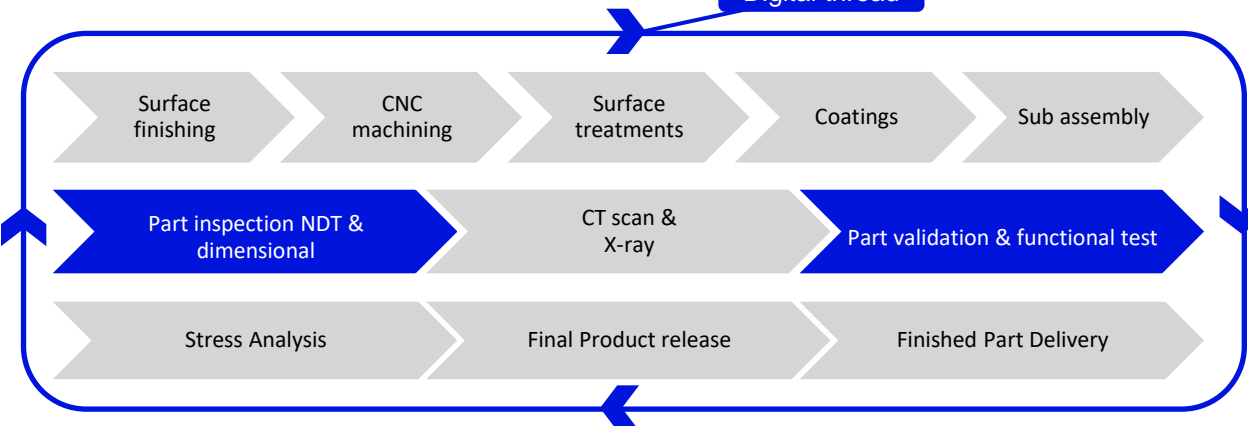
ADVANCED MANUFACTURING IN-HOUSE VALUE CHAIN



**Material
Creation**



Digital thread

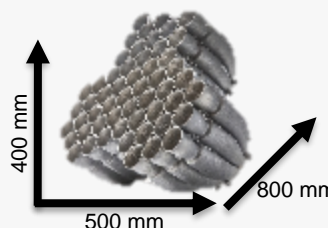
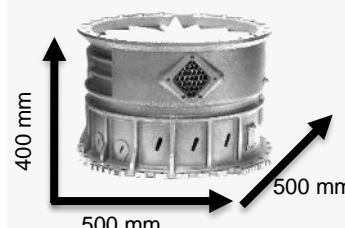

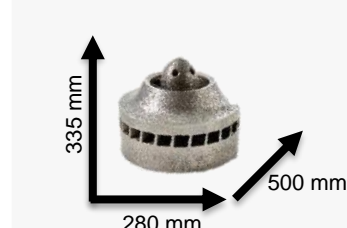
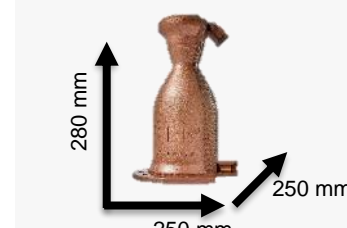


**Finished
Components
& sub-
assemblies**





Metal laser powder bed machine sizes & materials

| X Large (X-Line) | | | Large (M-Line) | | | Medium (M400-4 / SLM500) | | | Small (EOS/SLM/Renishaw) | | | | | | | | |
|--|--|--|---|--|--|--|--|--|---|--|--|---|--|--|---------|--|--|
| 1 Machine | | | 1 Machine | | | 6 Machines | | | 5 Machines | | | 35 Machines | | | | | |
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| Al-Base | | | Ni-Base | | | Ni-Base | | | Ti-Base | | | Ni-Base | | | Ti-Base | | |
| | | | | | | Al-Base | | | | | | Al-Base | | | Cu | | |
| | | | | | | | | | Fe-Base | | | Fe-Base | | | Other | | |
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CAPABILITY

HEAT TREATMENT & HIP

4 Vacuum furnaces

Up to 600x600x450 Class 2

5 Air furnace + Quench

Up to 1000x1000x1000 Class 2

1 Quintus: QIH 60-2070-1400 URC

Up to 410mm x 1000mm, 2000bar





CAPABILITY

CNC MACHINING

10 5 AXIS MULTI PALLET

Up to 800x800x550 (GF, MATSUURA, HERMLE)

2 4 AXIS

Up to 1270X670X625 (DOOSAN)

3 3 AXIS

Up to 1270X670X625 (DOOSAN, DMG)

3 LATHES

Up to Ø400x600 (DOOSAN)

7 Wire EDM

Up to 500x500x500 (GF)





CAPABILITY

QUALITY CONTROL

5 QUALITY CONTROL AREA

2 x Faro Scan Arm

1 x Zeiss Comet

1 x CMM Zeiss Contura

Profilometer

Roughness inspection

Microscope

1 X Mitutoyo Crysta Apex S 7106

CERTIFIED PARTS CONTROL

3D Scanning

CMM measurements

*DPI & FPI inspection

*Xray inspection

*CT Scan

DOCUMENTATION

*FAI (first article inspection)

*PPAP (Production Part Approval Process)

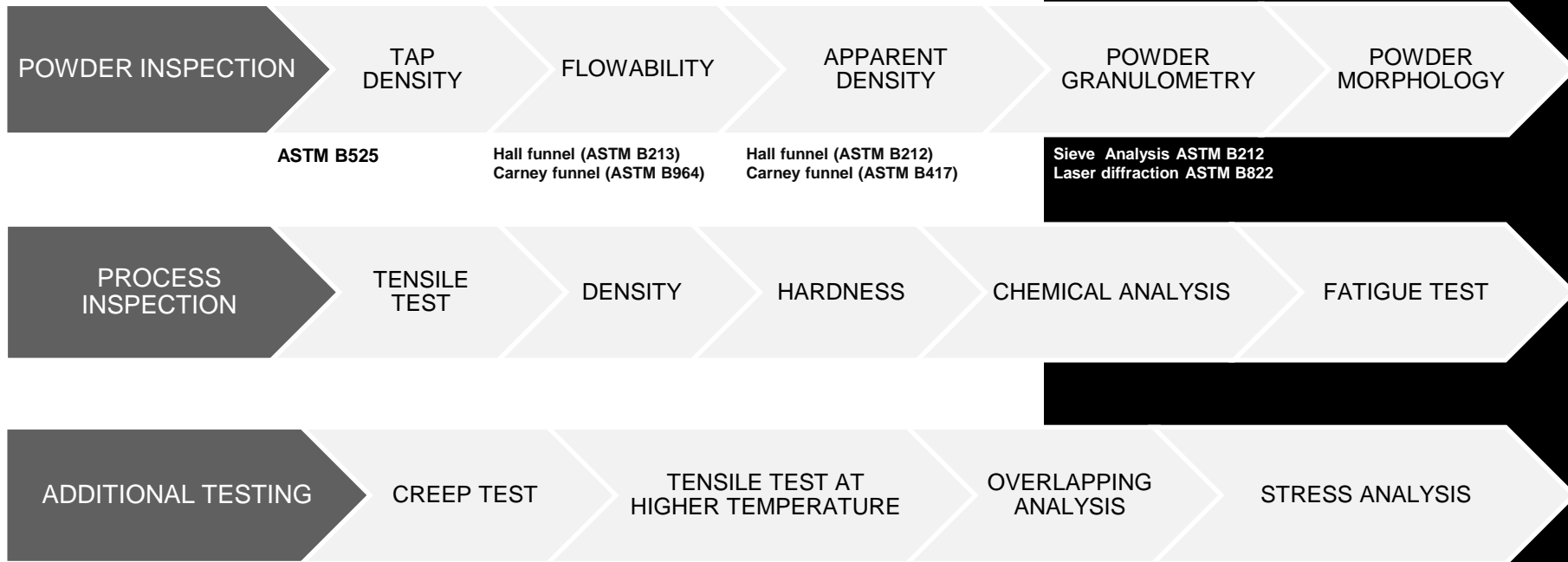
*PIS (part inspection standard)

*Control plan

*Validation reports



QUALITY CONTROL OF THE PROCESS





GROUP Project management lifecycle

Key:

- LG – Lifecycle gate
- WBS – Work breakdown structure
- OBS – Organisation breakdown structure
- KPI – Key Performance Indicator

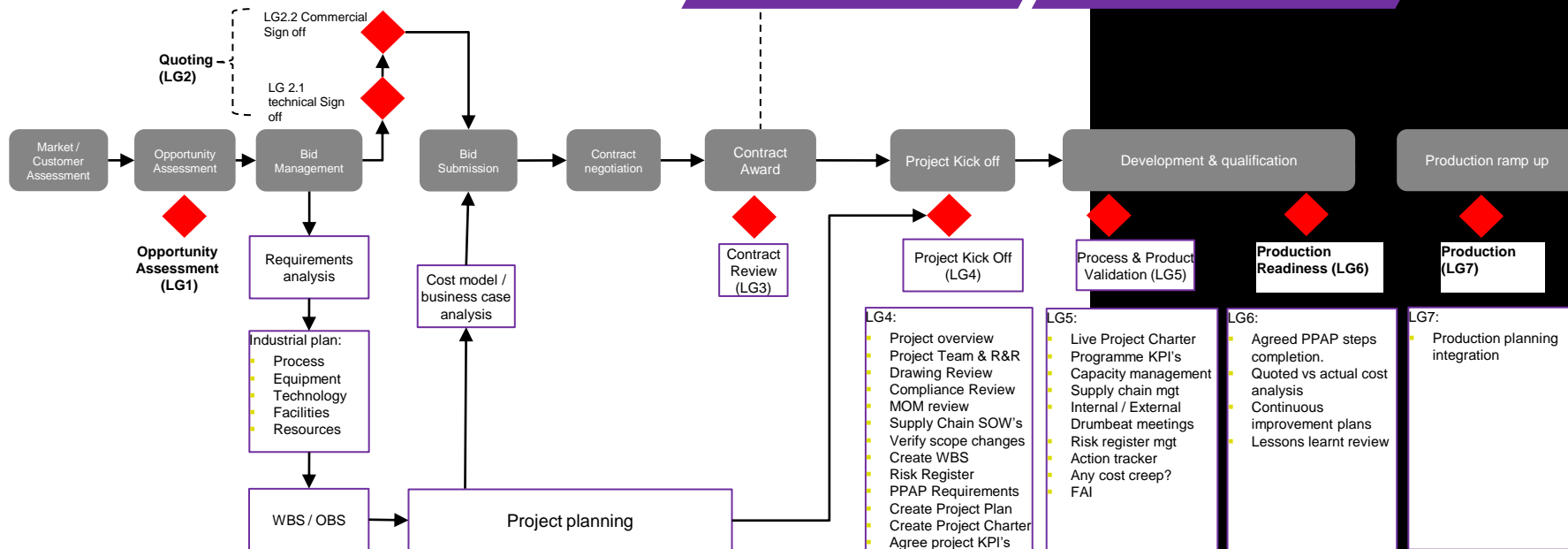
0. Strategy & Business Development

1. Planning

3. Ongoing Production

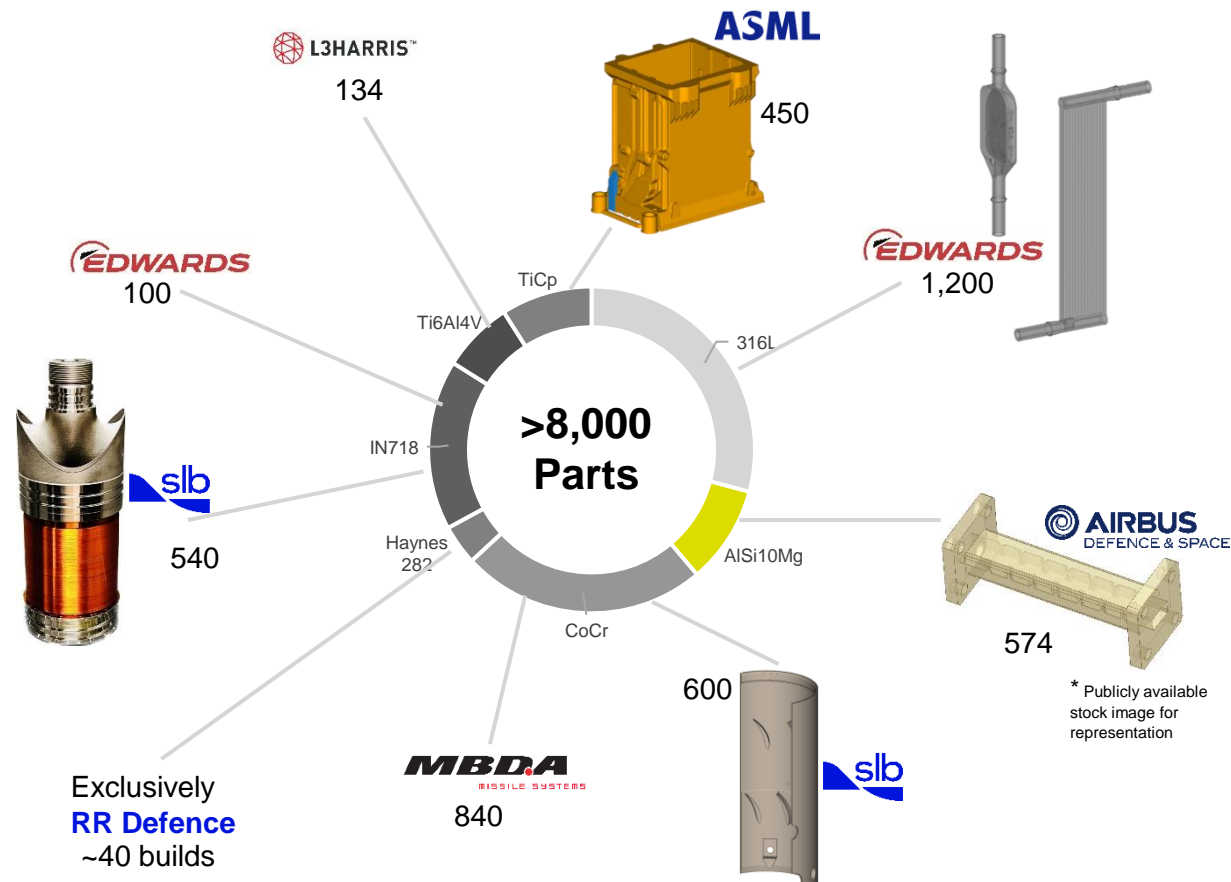
2. Material / Process & Product Design & Development

3. Material / Process & Product Validation





3T's PRODUCTION PARTS in 2023



- **~8,000 parts in 2023:**
 - **55%** (4,400) parts produced today are series production
 - **35%** (2,800) will be produced from NPI
 - **10%** tactical
- **7** production materials in the UK.



INNOVATING TO REDUCE COST

DRIVING COST OUT THROUGH INNOVATION

Hybrid Printing

3T 
Part of the
BEAMIT GROUP

- Only printing the **'complexity'** where its needed
- **Flexible manufacturing** capability for production and legacy requirements

