

# Advanced Manufacturing (ADM) Business

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# Outline

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- 1. ADM business overview**
- 2. Background of business unit establishment and future vision**
- 3. Strategy and business plan**
- 4. Additive Manufacturing market outlook and growth drivers**
- 5. Global business development and application development**

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# Digital Manufacturing: Status of Business Operations

 Items enclosed in red will be covered today.

## Vision

Enable innovations in manufacturing with applied optics application technologies

Digital Manufacturing	Industrial Metrology BU
	Advanced Manufacturing BU

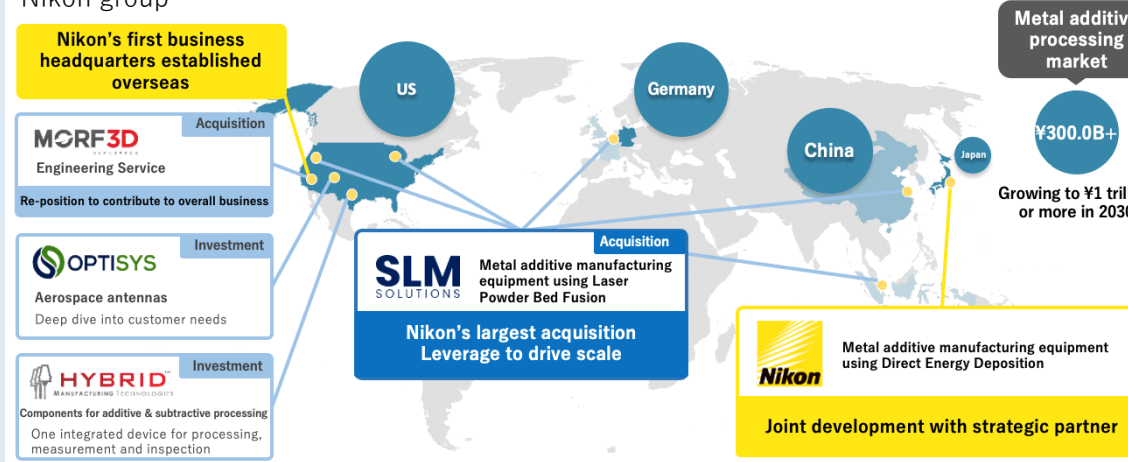
### Progress in Year 1 of Plan

- Material Processing (growth driver)**
  - Built up a variety of measures aimed at accelerating growth, including the SLM acquisition, launch of a new standalone business unit, and the establishment of a business headquarters on the US West Coast, where many customers need precision metal processing.
- Robot vision (growth driver)**
  - Validated upgraded and more efficient parts pick & place with promising partner
- Laser radar and X-ray and CT systems**
  - Expanded product and sales infrastructure for automotive and EV batteries. Achieved solid growth.
- In-line measurement**
  - Serving the automotive, aerospace and other industries, executed automated high precision non-contact metrology in large space and achieved compact, high speed, light weight format for industrial inspection.

## Topics

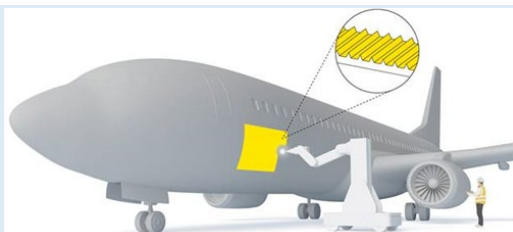
**Expanded base for additive manufacturing business**

- Built out infrastructure in Japan, US and Europe and accelerated co-creation within the Nikon group



**Riblet processing**

- Implemented durability tests on effects of drag reduction with ANA, JAL and JAXA for potential deployment to flights resulting in improved fuel efficiency and CO2 reduction.



**Cultivate into core business of vision 2030 “a key technology solutions company in a global society where humans and machines co-create seamlessly”**

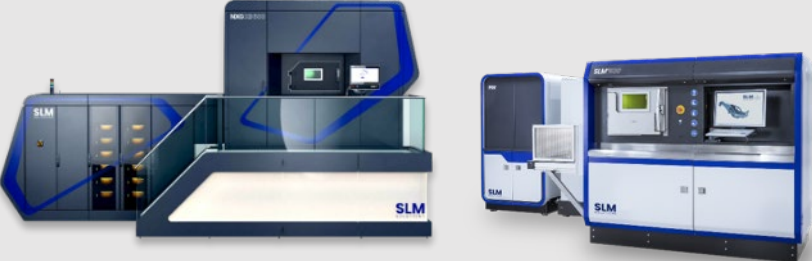



# Correspondence Relationship Between ADM Business Unit and Company-wide Business Disclosure Segment

Excerpt from business results announcement material  
Period ending March 2023

Old Segment	Business Unit (BU)			Business Unit (BU)		New Segment
Imaging Products	Imaging BU		→	Imaging BU		Imaging Products
Precision Equipment	FPD Lithography BU			Precision Equipment Group	FPD Lithography BU	Precision Equipment
	Semiconductor Lithography BU				Semiconductor Lithography BU	
Healthcare	Healthcare BU			Healthcare BU		Healthcare
Components	Customized Products BU			Customized Products BU		Components
	Glass BU			Glass BU		
	Digital Solutions BU	Optical components, etc.		Digital Solutions BU		
Industrial Metrology and Others	Industrial Metrology BU		→	Industrial Metrology BU		Digital Manufacturing
	Others	Material processing (incl. Morf3D)		Advanced Manufacturing BU		
		SLM		Others*		Others
Corporate expenses, etc.	Headquarters division of the parent company			Headquarters division of the parent company		Corporate expenses, etc.
		Next Generation Project Division (partly)			Next Generation Project Division	

Departments and subsidiaries in the Material Processing Business have been consolidated under the Advanced Manufacturing BU and combined with the Industrial Metrology BU to make up the Digital Manufacturing Business segment (aligns with Medium-Term Management Plan business domain).

# ADM Business Unit: Business Portfolio and Business Description

Products	<h2>Nikon SLM Solutions</h2>	<ul style="list-style-type: none"> <li>Sales of LPBF*1 type metal 3D printer</li> <li>Maintenance and service, including powder sales</li> </ul> <div style="border: 1px solid #4a86e8; border-radius: 10px; padding: 5px; margin-top: 10px;"> <ul style="list-style-type: none"> <li>Forerunner of multi-laser system, and tech leader</li> <li>Due to M&amp;A, making it a 100% Nikon subsidiary → Company name changed to “Nikon SLM Solutions”</li> </ul> </div>	 <p style="text-align: center;">NXG XII 600                      SLM500</p>
	<h2>Nikon Organic</h2>	<ul style="list-style-type: none"> <li>Sales of DED*1 type metal 3D printer</li> <li>Sales of high-precision ultra-short pulse laser processing equipment</li> <li>Sales of auxiliary measurement devices</li> <li>Optical and measurement engine sales</li> </ul>	 <p style="text-align: center;">Lasermeister Additive                      Lasermeister Subtractive</p>
Solutions	<h2>Morf3D</h2>	<ul style="list-style-type: none"> <li>Manufacturing of high value-added metal parts</li> <li>Manufacturing process contract development and engineering</li> <li>Mass production transition support</li> </ul>	 <p style="text-align: center;">Process development / Engineering and manufacturing</p>
	<h2>Riblet *2 as a Service (commercialization timing is TBD)</h2>	<ul style="list-style-type: none"> <li>Improve efficiency and reduce fuel consumption of fluid equipment</li> <li>Riblet pattern design and construction</li> <li>Performance prediction simulation</li> </ul>	 <p style="text-align: center;">Fuel saving / CO2 reduction</p>

\*1) LPBF: Laser Powder Bed Fusion; DED: Directed Energy Deposition. Both are methods of metal 3D printing.

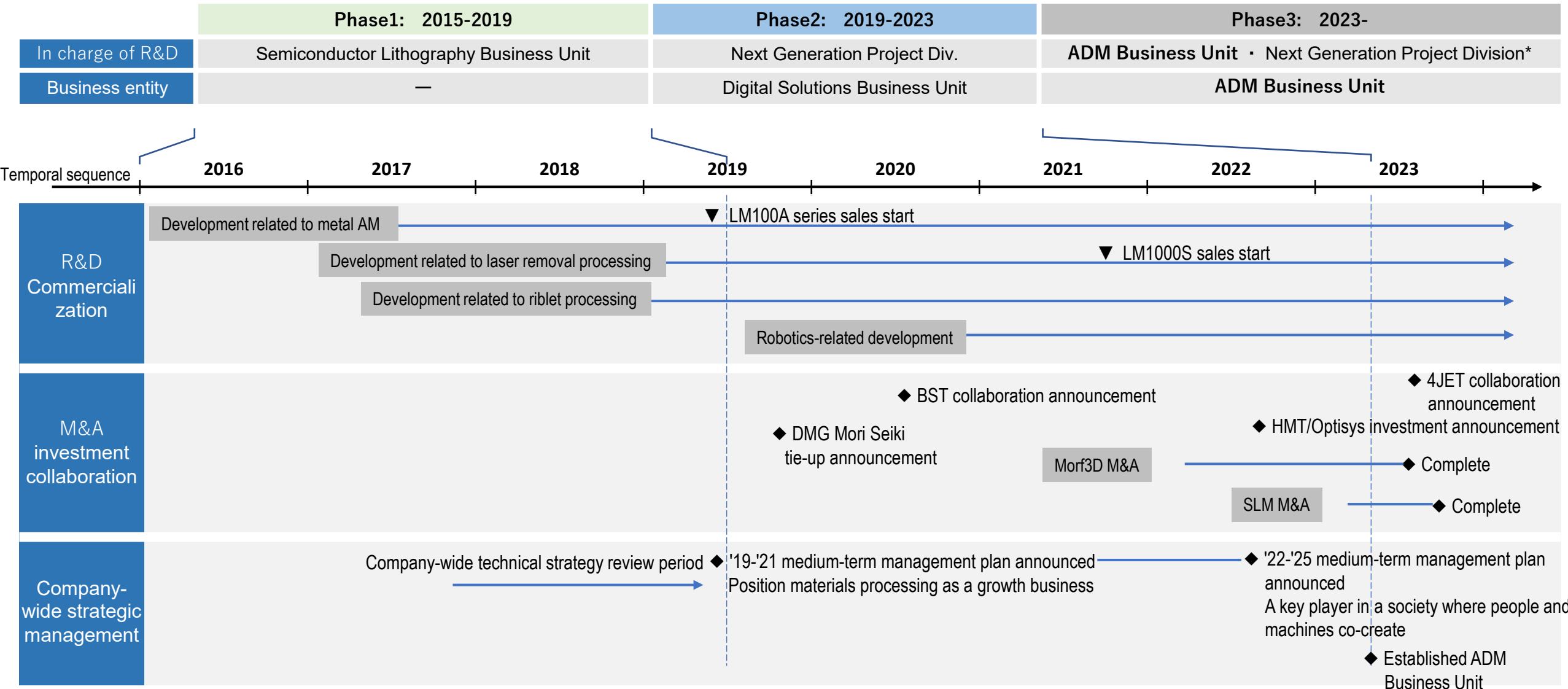
\*2) The cost related to riblets is attributed to the Next Generation Project Division and is recorded to investment in growth included in corporate expenses.

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# Background of Business Unit Establishment



**Started with small-scale R&D activities, and then was established as a new business unit via a large M&A**

\*) The cost related to riblets is attributed to the Next Generation Project Division and is recorded to investment in growth included in corporate expenses



# Reasons for Nikon to Take on Digital Manufacturing

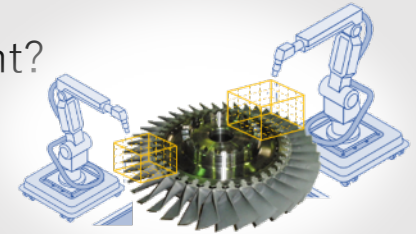
## Inception

- Nikon has accumulated massive amounts of technologies in lithography systems
- But those technologies had mostly not been leveraged outside lithography



## Hypothesis

- What else could those technologies be applied toward?
- Could they be used to solve latent needs that had gone unnoticed up to this point?
- Is there anything that Nikon is uniquely equipped to tackle?
- Would it be possible to launch something new that could become a pillar of Nikon's business portfolio?
- Could that domain be Digital Manufacturing?



Propose

Prove

Hypothesis realization

**Nikon's growth as a company**

**Contributions to society**

Amend

After numerous amendments, the hypothesis was proven and eventually became a reality

# ADM Business Unit Vision and Aspirations for 2030

## ADM Business Unit vision

- Create new markets and industries for manufacturing
- Build a high-growth businesses utilizing Nikon's internal business and technology synergies
- Through digital manufacturing, promote fundamental solutions for personnel-dependent and location-dependent manufacturing
- Through riblet pattern technology, contribute to reducing energy consumption and CO2 emissions

## Vision for 2030: Revolutionize the world of manufacturing through optical application technology

- Establish a solid position as a manufacturer using "optical processing machines and solutions" and grow it into one of the pillars of Nikon business
- Applications that are only possible with optical processing machines are being realized one after another
- Optical processing machines have become widespread as tools for machining, and are used in every situation as a matter of course
- Riblet processing \* for fluid machinery has been put to practical use in multiple fields, and it has become a major business as a processing service

(Optical processing machine: A generic name at Nikon for processing equipment that applies optical characteristics, such as 3D printers and ultrashort pulsed laser processing machines)

\*) The cost related to riblets is attributed to the Next Generation Project Division and is recorded to investment in growth included in corporate expenses.

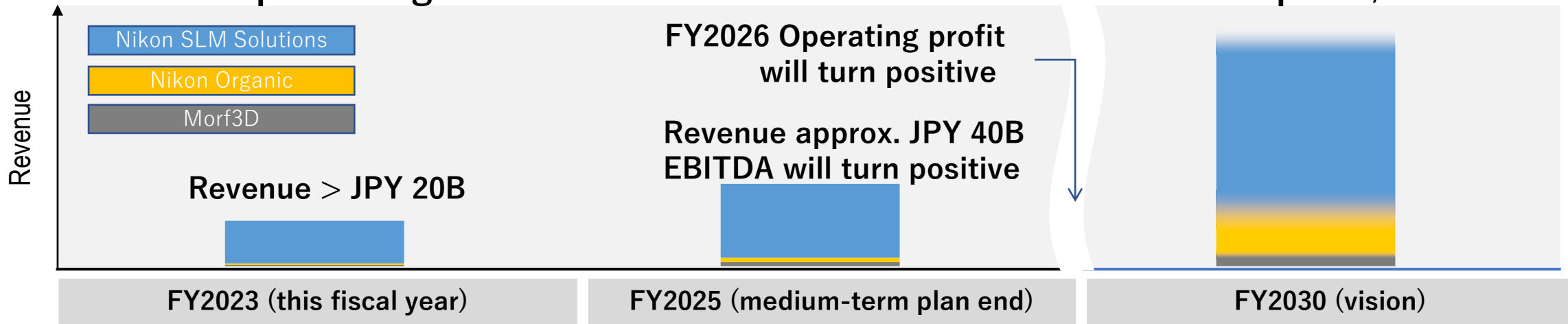
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# Strategy, Business Plan, Major Milestones

## Conceptual diagram of ADM Business Unit overall revenue and profit/loss



	FY2023 (this fiscal year)	PMI	FY2025 (medium-term plan end)	FY2030 (vision)
<b>Nikon SLM Solutions</b>	<ul style="list-style-type: none"> <li>Made wholly owned subsidiary, complete</li> <li>Started to achieve synergy with Nikon</li> </ul>		<ul style="list-style-type: none"> <li>Make SLM-stand-alone operating profit positive</li> <li>No. 1 share in metal AM equipment market</li> </ul>	<ul style="list-style-type: none"> <li>Fixed market leader</li> <li>Significant expansion of AM market base</li> <li>Stable income from service business</li> </ul>
<b>Nikon Organic &amp; Riblet</b>	<ul style="list-style-type: none"> <li>Independent as a business unit</li> <li>Establishment of US headquarters</li> <li>Start sales of equipment in the US</li> <li>Start to achieve synergy with SLM</li> </ul>		<ul style="list-style-type: none"> <li>Supply of major modules to SLM equipment</li> <li>Equipment sales &gt; JPY 2B</li> <li>Riblet business commercialization</li> </ul>	<ul style="list-style-type: none"> <li>Vs. business unit overall revenue &gt; 20%</li> <li>Profitable operations in the organic business alone</li> <li>Scaling of Riblet business</li> <li>Expansion of product portfolio</li> </ul>
<b>Morf3D</b>	<ul style="list-style-type: none"> <li>Made wholly owned subsidiary, restructuring complete</li> <li>Focus on defense-related development PJ</li> <li>Construction of SLM and Nikon bases on site</li> </ul>		<ul style="list-style-type: none"> <li>Cash flow neutral</li> <li>Contract development PJs from multiple Primes</li> <li>First PJ shift to serial production</li> </ul>	<ul style="list-style-type: none"> <li>Multiple PJs shifted to serial production</li> <li>Greatly contribute to sales expansion of equipment</li> </ul>

\*) Figures are based on excluding riblet-related sales revenue, costs, etc.

# - Nikon SLM Solutions – Becoming a Market Leader in Metal 3D Printers

## SLM's '21-'25 medium-term plan VISION2025

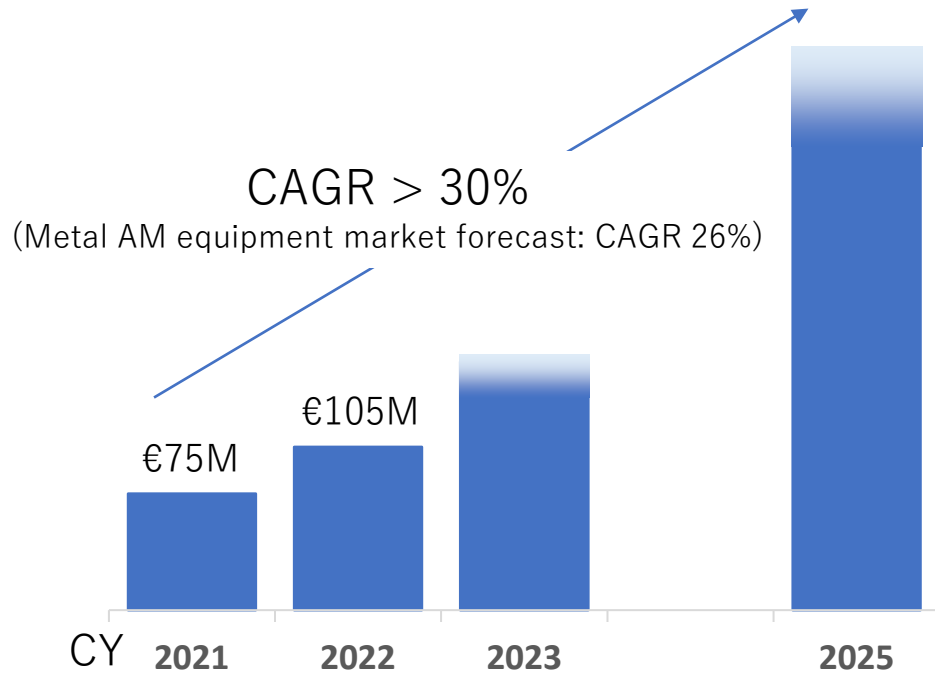
### VISION 2025

CHANGE MANUFACTURING FOREVER

5X REVENUE  
BY 2025

MARKET LEADER  
BY 2025

- Target 5x revenue growth in 2021-2025
- Become No.1 in the industry by 2025



Beyond



Large format  
NXG600



Medium format  
SLM280



Small format  
SLM125

- Close collaboration with key customers
- Defense and aerospace Primes
  - "Hyper Car" OEM/foundries

- Establishment of application development sites in the US and Japan
- First introduction and market expansion of NXG into APAC
  - Large format AM market expansion

- Core module supply and technology provision from Nikon
- Optical and measurement engines
  - Process control and calibration technology

- Development and horizontal deployment of next-generation platforms
- Strengthen competitiveness of small and medium-sized machines
  - Improve cost competitiveness

- Company name change and integration with Nikon brand
- "Nikon SLM Solutions"
  - Leverage popular equipment segment

Maintain our position as a tech leader. Through collaboration with Nikon,  
we achieved growth at a rate that exceeds the industry average

# - Organic & Riblet – Growth Utilizing Acquired Management Assets and Collaboration

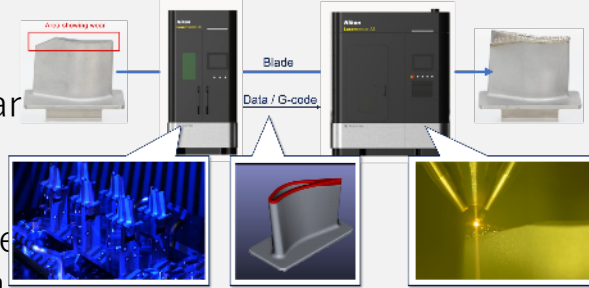
## Existing products

- Lasermeister 10XA
- Lasermeister 1000S



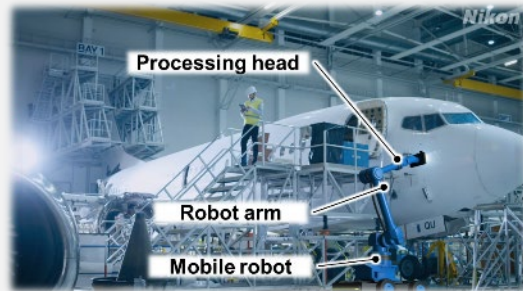
## Future products

- Turbine repair equipment
- Measurement linking and advanced automation
- Next-generation DED 3D printing
- High speed and high definition



## Riblet as a Service

- Commercial airframes
- Wind-powered turbines
- Freighters
- UAV and special uses



Collaboration on SLM customer base utilization and marketing

Application and customer development at US sites

Collaboration, technology introduction, and customer acquisition with German company Fraunhofer ILT

Collaboration with domestic heavy industries, application in Japanese government projects, etc.

Acquisition of certification through collaboration with airlines and OEM

Joint development of ultra high-speed laser mobile processing technology

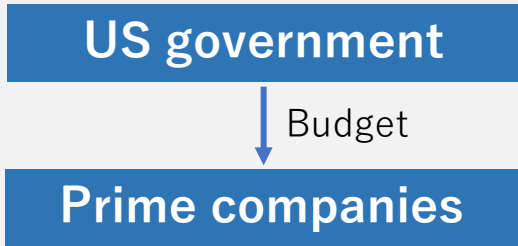
Market entry with freeform curve riblet film

**Leverage collaboration to scale our business. Aim to grow to 20% of business unit sales by 2030**

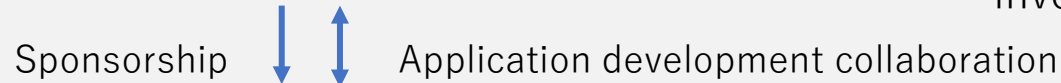
# Application Development Centered on the Aerospace and Defense Industry

## Morf3D (Long Beach, California)

- Made it a 100% subsidiary in 7/2023.
- Structural reform implementation and shifts in business strategies
- Focus on aerospace & defense-related applications
- Also used as a business development site for Nikon and SLM



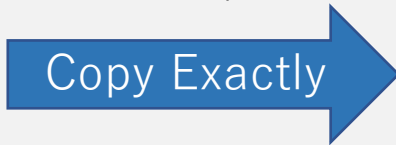
- US defense-related AM demand expected to grow rapidly (CAGR > 50%)
- Application development requires engineering and time
- Only companies that meet certain requirements can be involved.



**Morf3D**

- Application development
- Process development
- Theory verification
- Small-scale production

Shift to mass production



**Prime companies and Service Bureaus**

- Mass production deployment, support, and service
- At least 10 to 15 years
- Same equipment and same processes

**Long-term Nikon/SLM equipment demand acquisition (lock-in effect) through “Copy exactly policy”**

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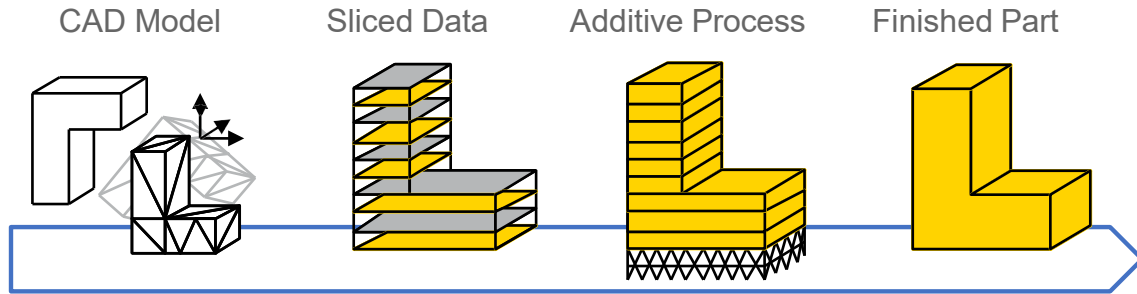
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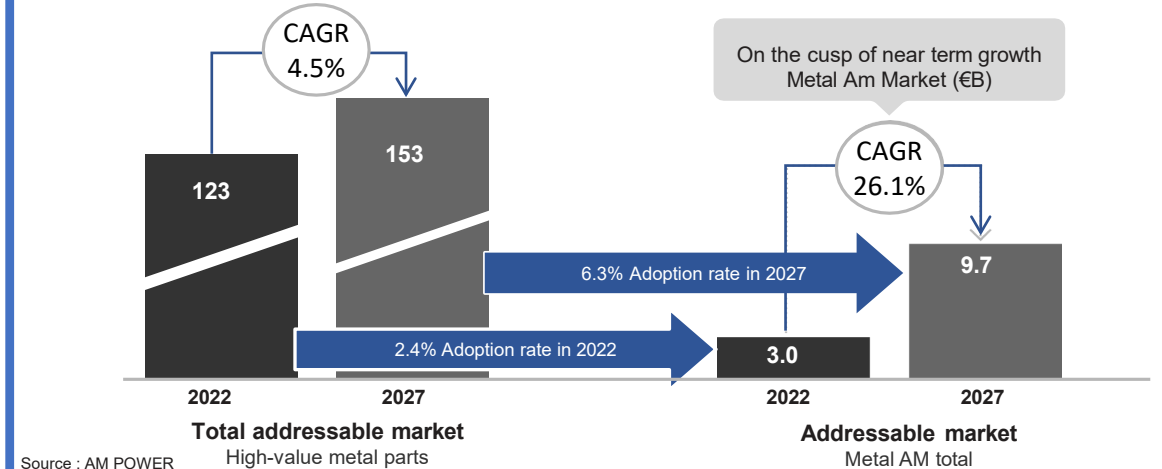
# Metal Additive Manufacturing

## What



Manufacturing of 3D object (part) from a digital 3D model (CAD)

## Untapped Growth(€B) - <2.5x adoption rate now



## Why

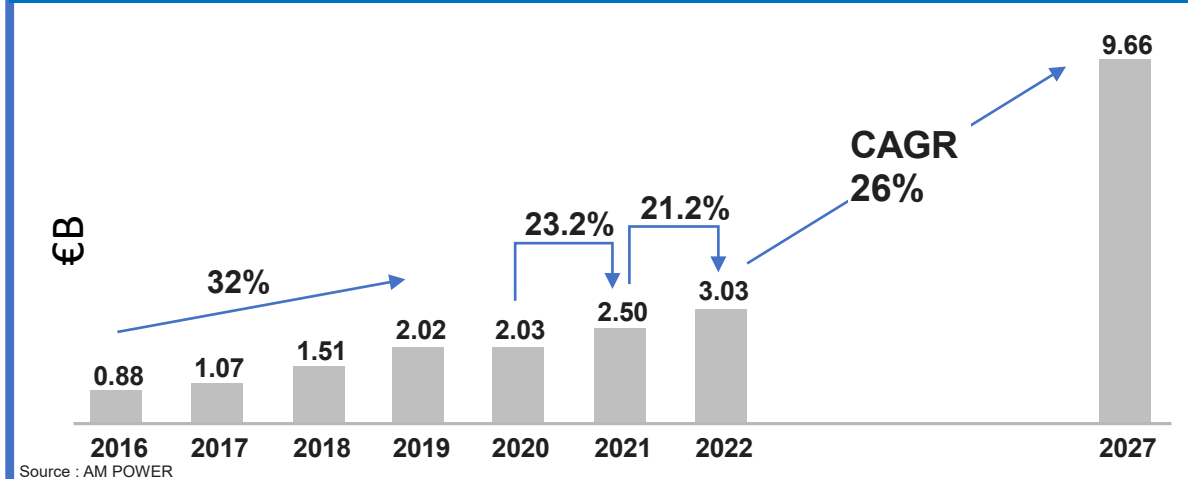
### Advantages:

- Making complex 3D monolithic parts possible
- CAD to part - reduced cycle time
- Reduce waste

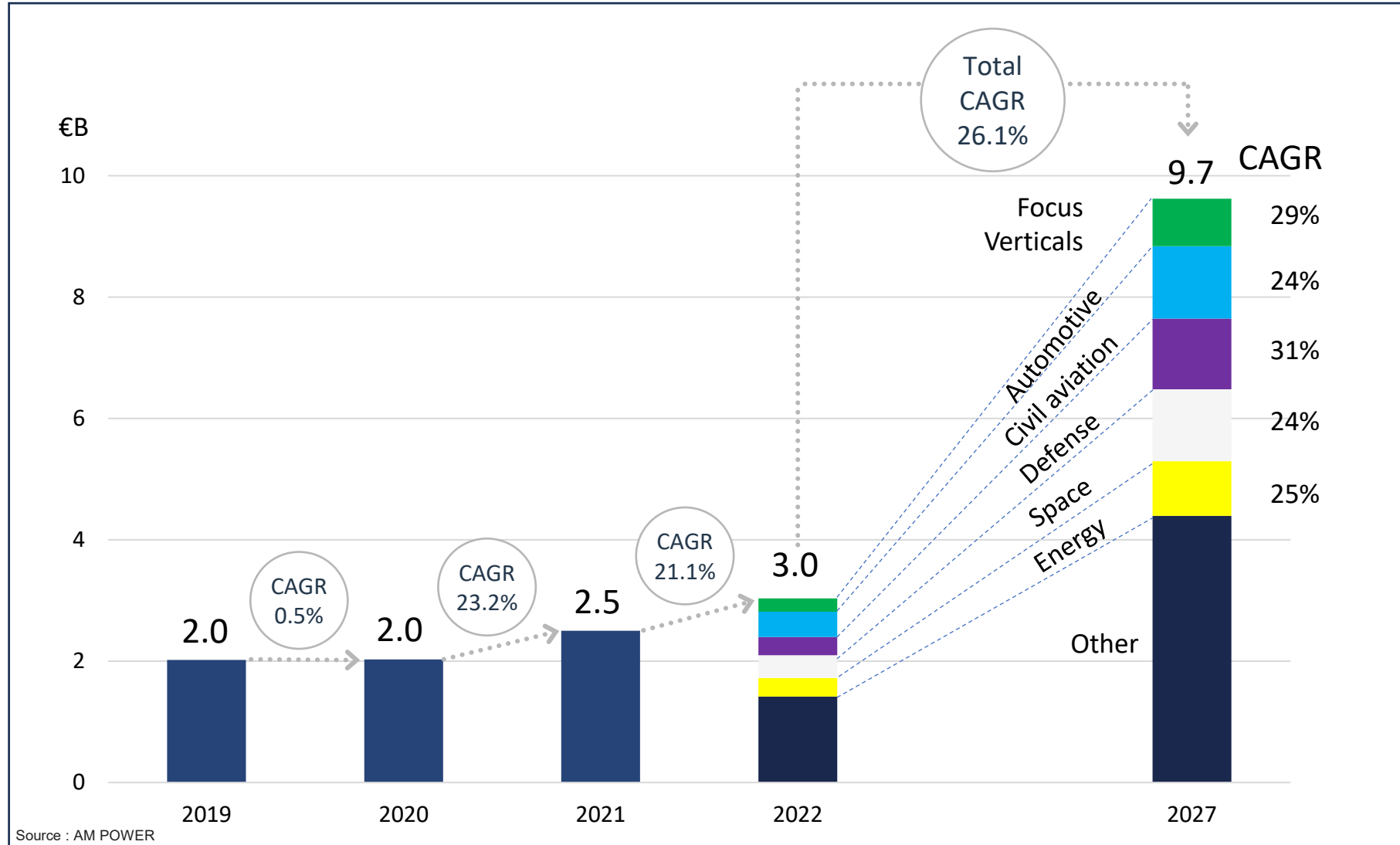
### Challenges:

- Still largely used in prototyping - not HVM
- Size limitation
- Limited materials
- Repeatability + speed - lower cost

## Accelerating > 20% YoY growth



# Metal AM Market Growth and Verticals



Source : AM POWER

- We are focused on the fastest growing segments of an already growing market
- These segments require ultra large, high precision and very high productivity
- Our technology roadmap and portfolio matches our customer requirements

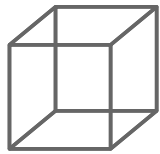
# Right Solutions

## Removal of limitations

Remove geometric or material limitation preventing transition to AM

### Competitors

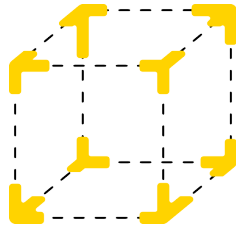
#### Limited



Limited materials offered

### Us

#### No Limit

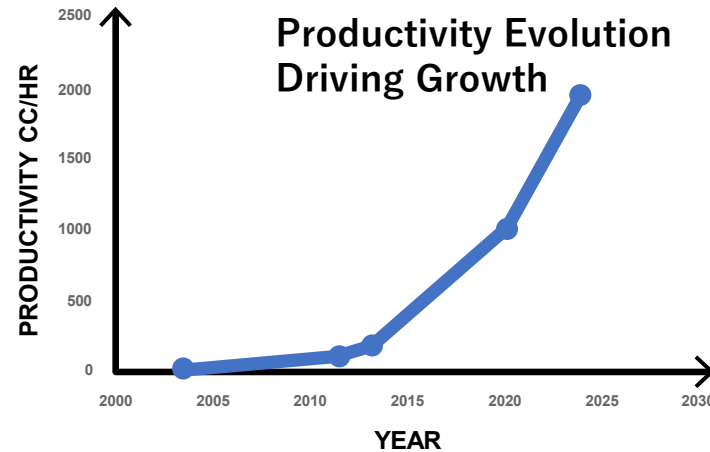


More than 45 materials – Open Architecture allows for easy adaptation



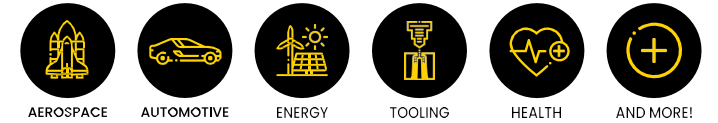
## Productivity

Productivity has increased exponentially resulting in significant cost parity with conventional means



## Reliability and scalability

850+ Install base in every major industry



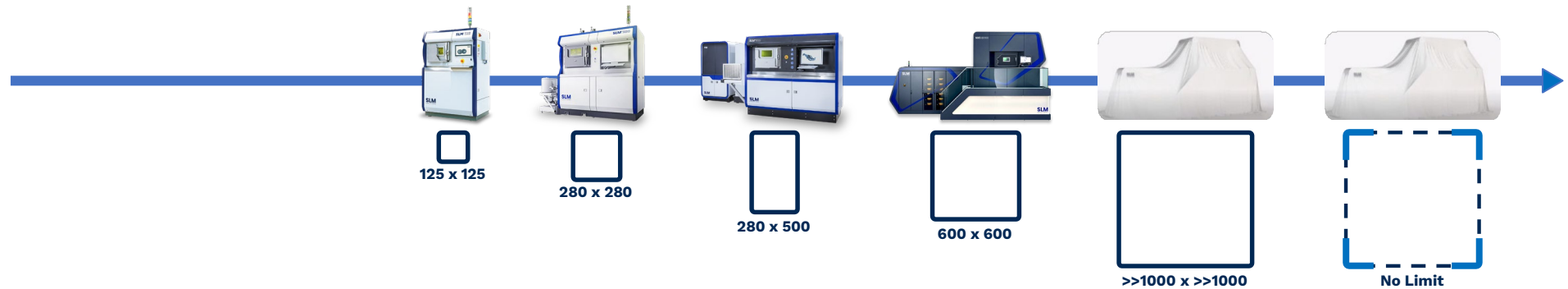
HONDA	BMW	KLS Martin Group	RMIT University
Porsche	Volkswagen	BONE 3D	EMERSON
Collins Aerospace	NASA	BOEING	Swiss m4m Center
RFA	Baker Hughes	AIRBUS	AND MORE!
SIEMENS	Blue Origin	SAFRAN	

# Nikon SLM Solutions – Leading Edge LPBF Portfolio

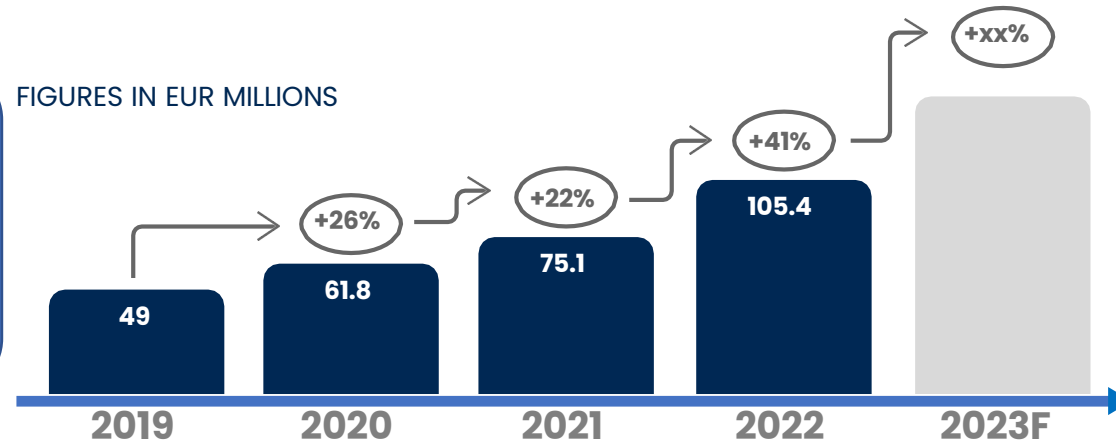
## PRODUCTIVITY



## BUILD VOLUME (mm)



## REVENUE GROWTH AND MARKET EXPANSION

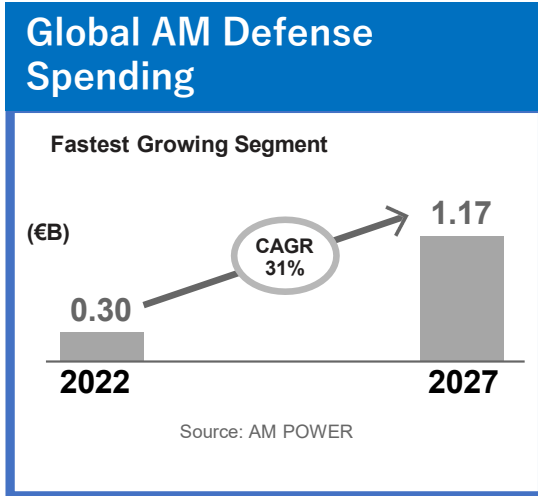


### Market expansion and growth driven by several favorable developments

- Productivity increase of next generation of AM machines
- New parts being specifically designed to make use of advantages of AM production
- AM increasingly being integrated in industrialized production processes
- Completion of ongoing certification processes of AM produced parts

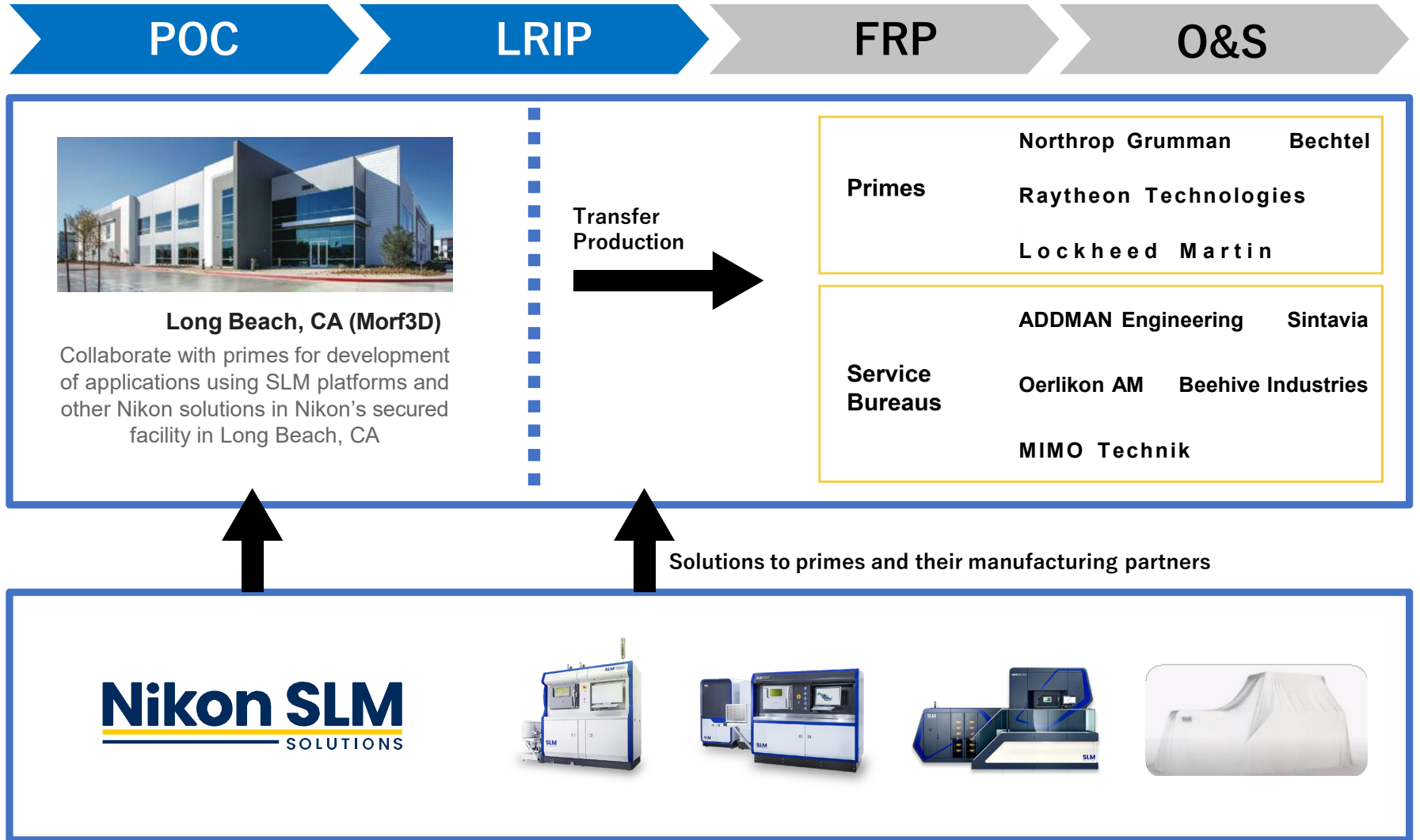
# Capitalize On Aerospace & Defense Opportunity Using Nikon Assets

Accelerate adoption – goal to make SLM Solutions defacto standard



### Examples of AM applications

- Aircraft** — Gooseneck Kueger Flap Actuation Bracket
- Ships / Submarine** — Impeller
- Satellite** — RF antenna and waveguide



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# Global Presence – BD, Demo, Apps, Support



**Japan**

Kumagaya/Gyoda area

- R&D overall (element development, product design)
- Japan application development center (Latest technology including NXG - customer application development.)

Nikon Shinagawa head office

- Sales and Marketing in Japan
- Manufacturing/QA

**US West Coast**

Nikon Advanced Manufacturing Inc. HQ

- Global headquarters of Nikon Advanced Manufacturing
- Strategy, governance, management

Long Beach Center (Morf3D)

- U.S. ultra secure facility
- SLM/Nikon application development center including demo
- Business Development, engineering and customer support

**Germany**

Nikon SLM Solutions Lubeck HQ

- R&D overall/product manufacturing/QA
- Application development center
- Other headquarters functions

Fraunhofer ILT

- Nikon DED equipment exhibit demonstrations/customer development
- Application development
- Joint technology development

# Recap

1

Digital Manufacturing is a growth driver and key component of Nikon Vision 2030

2

Our vision is to revolutionize manufacturing by use of advanced optical technologies at scale

3

Metal Additive Manufacturing is at the cusp of adoption, creating a major market yet to be tapped

4

Nikon's comprehensive technology and manufacturing portfolio coupled with its trusted brand will accelerate adoption of AM into manufacturing

5

Nikon's investments in both organic and inorganic assets and their integration are paving the way to realize this growth

6

We expect Digital Manufacturing to be a core business and source of growth and profit for Nikon by 2030