



QIMAL

OPTIMIZATION OF **VISUAL INSPECTION**
PROCESS

PITCH DECK

September, 27st 2023

REACH

NEXT GENERATION DATA INCUBATOR

Y O U B I Q U O

CHALLENGE

VISUAL
INSPECTION
OPTIMIZATION
IN METAL ADDITIVE
MANUFACTURING
PROCESSES



END USER

3D Printing Process Engineer

He needs to:

1. **Adapt the CAD design** for the 3D printing machine
2. **Set-up** the operating **machine parameter**



PROBLEM

Process Robustness
&
Quality Repeatability



Real-time Defect Detection



Root-cause Defect Analysis



1 Failed Job = 1-3 Weeks lost

SOLUTION

DATA
CORRELATION
ANALYSIS
SYSTEM



SOLUTION



Real-time Defect Detection

Detection of process deviations and part defects.



Root-cause Analysis

Understanding the root-cause of defects.

Business Benefits



Cost Saving per Failed Job with PBF*

32K€ (Aluminum) - **46K€** (Titanium)
28K€ - 34K€ (if material is recycled)



Secure & Trusted Data Value Chain

100% Data Security

Technical Benefits = KPIs



Mean Absolute Error on Defect Prediction

<10%



Time of Root Cause Analysis

< 5 min

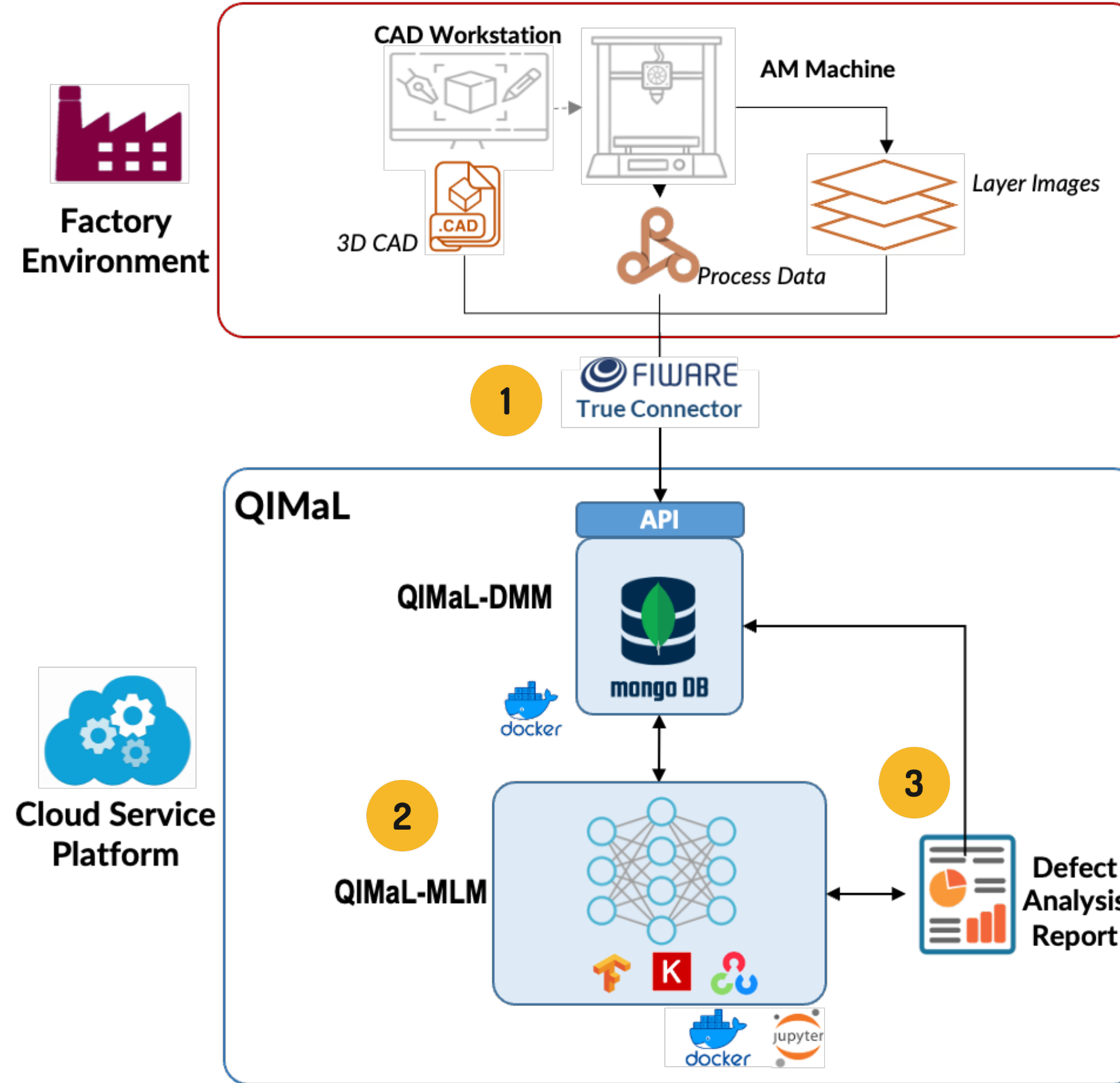
*Including pre-printing, printing, material and post-processing evaluated on the same part the which data have been used for the MVP.

PRODUCT

QIMaL

Y O U B I Q U O

THE IN-PROCESS
DEFECT
CORRELATION
TOOL



1

Data Ingestion in a Trusted DVC Ecosystem



2

Data Correlation Analysis for Root Cause Detection



3

Defect Analysis Report



VALUE PROPOSITION

QIMaL

is a quality inspection system for metal additive manufacturing processes **that** combines the analysis of final product images with 3D CAD design and machine operating parameters and **differently from competitors** it identifies the **root cause of defects** and elaborates data within a trusted value chain platform.

REACH

2027 MARKET SIZE

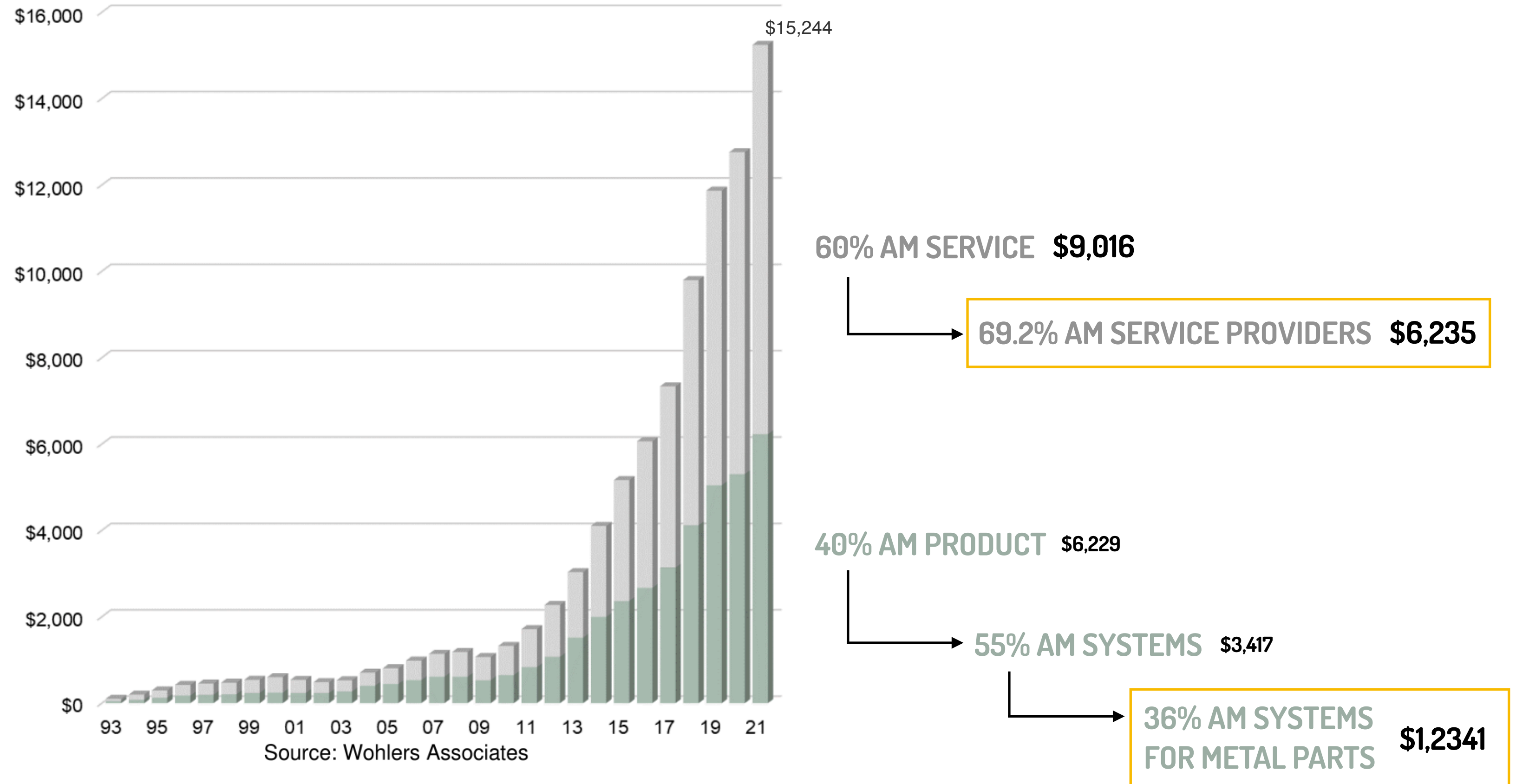
GLOBAL ADDITIVE MANUFACTURING MARKET



2022 Additive Summary (Wohlers Report 2022)

- Overall AM product and service worldwide grew by 19.5% to **\$15.244** (around EUR 14 billion) in 2021
- Annual expected growth of **19%** per year until 2027
- Total market to reach **DOLLAR 43.25 billion** (around EUR 40 billion) **2027**

Global Additive Manufacturing product and service market to 1993 to 2021 [DOLLAR billion]

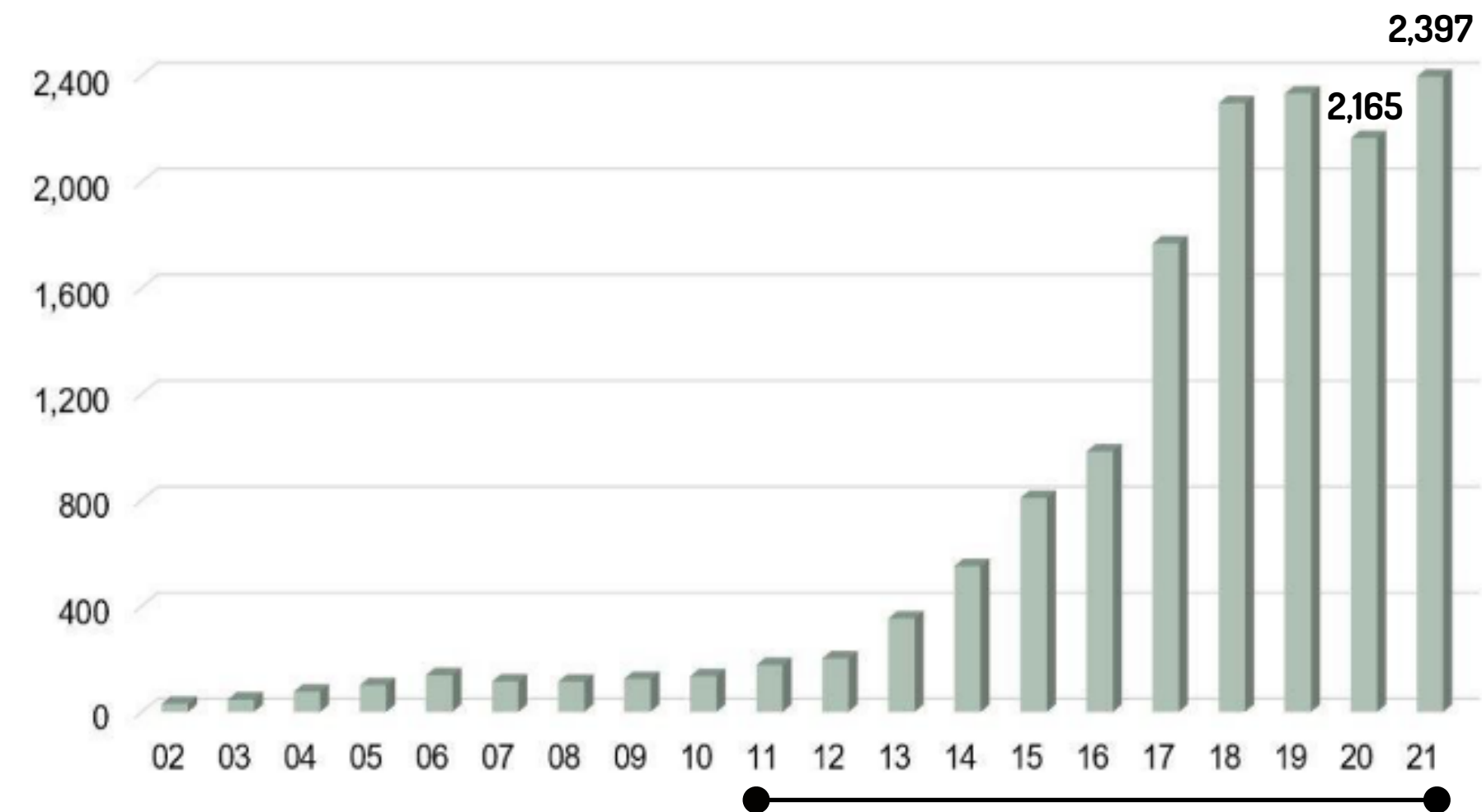


MARKET OPPORTUNITY

GLOBAL ADDITIVE MANUFACTURING MARKET



Sales of AM systems for metal parts (Wohlers Associates)



Metal Additive Manufacturing Example:

- **13,500** metal additive machines installed **between 2011 - 2021**
- >2,000 additional relevant machines added a year (>20% CARG *)
- 0.51 % coverage of installed market in 2028 yields around **€10M annual recurring revenue**

QIMAL 5Y BP	2024	2025	2026	2027	2028
N. of installed machines	24.000	24.000	24.000	24.000	24.00
20%					
Total Machine	24.000	28.800	34.560	41.472	49.766
Average Monthly Subscription	0	6	18	54	170
Total Customers EoY (*)	0	10	25	80	253
QIMAL share		0,03%	0,07%	0,19%	0,51%
Subscription per year	40.800 €	40.800 €	40.800 €	40.800 €	40.800 €
Revenues from subscription	- €	244.800 €	734.400 €	2.203.200 €	6.936.000 €
Customers	0	8	27	83	260
Set -up Fee	0	84.000 €	283.500 €	871.500 €	2.730.000 €
Total Revenues	- €	328.800 €	1.017.900 €	3.074.700 €	9.666.000 €

(*) Customers considers churn of 5%

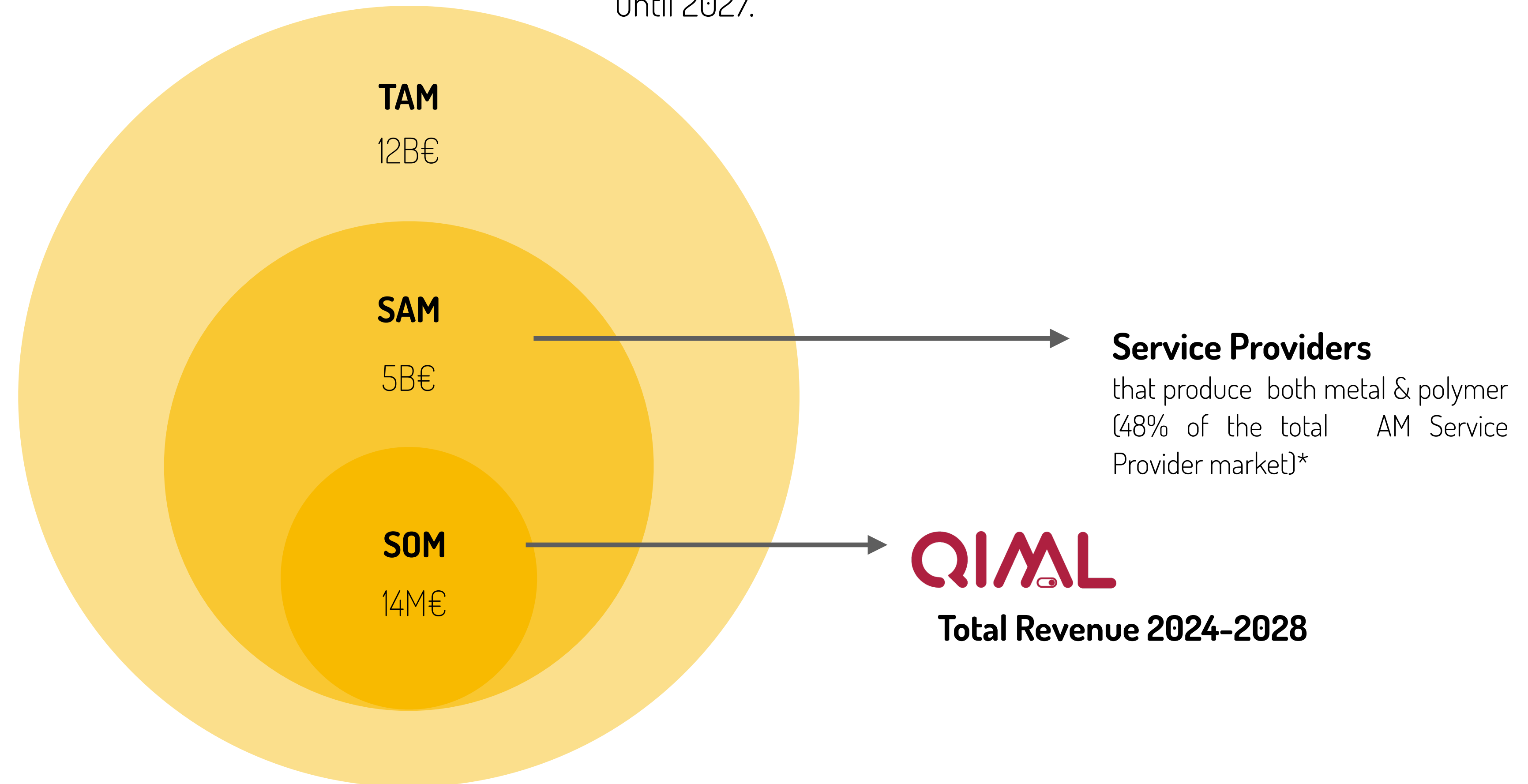
*Annual Metal AM System Sales 2020 and forecast 2025 [Units]

2027 MARKET SIZE

GLOBAL METAL ADDITIVE MANUFACTURING MARKET



The **metal AM market** alone was valued at more than **EUR 3 billion** in 2022 and is expected to have a CAGR of almost 30% until 2027.



*Wohlers Report 2022 3d Printing and Additive Manufacturing Global State of the Industry

DIRECT
COMPETITION
MATRIX

PROCESS
MONITORING
SOFTWARE FOR
METAL ADDITIVE
MANUFACTURING



AM EXPLORER

|interspectra|

Data & Machine Agnostic



Defect Correlation

ADDIGURU



Addiguru & Frinde are made of HW+
SW to be integrated with the machines

PrintRite3D[®]
In-Process Quality Assurance (IPQA)



DIRECT
COMPETITION
CHART

PROCESS
MONITORING
SOFTWARE FOR
METAL ADDITIVE
MANUFACTURING

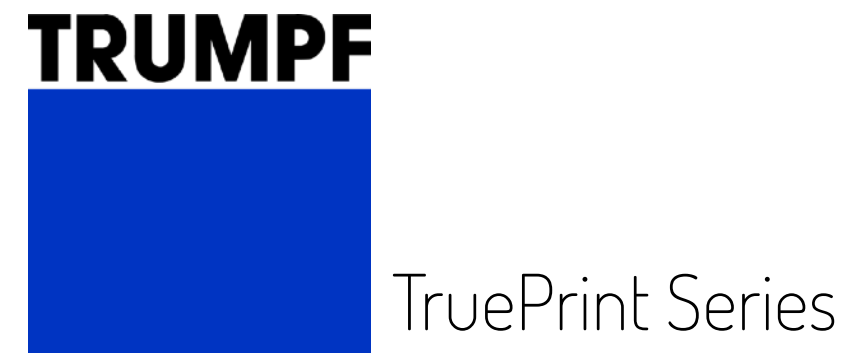
COMPANY	SYSTEM NAME	SYSTEM TYPE	DEFECT ANALYSIS	ROOT CAUSE ANALYSIS	DATA AGNOSTIC	MACHINE AGNOSTIC	REAL TIME MONITORING	DATA TRUSTING & SECURITY	MACHINE PREDICTIVE MAINTENANCE
Addiguru	Real-time monitoring and issue detection fro LPBF	HW + SW	X		X	X	X		
Phase 3D	Fringe	HW + SW	X		X	X	X		
Interspectral	AM EXPLORER	SW (Application Based)			X	X			
Sigma Additive Solutions	PrintRite3D	SW (Application Based)	X	X	X		X	X	
Youbiquo	QIMAL	SW (Web-based)	X	X	X	X	X	IDS CONNECTOR	PLANNED

INDIRECT
COMPETITION

QUALITY
MONITORING FOR
METAL ADDITIVE
MANUFACTURING

REACH

QUALITY MONITORING Suite embedded with Metal 3D Printing Machines such as:



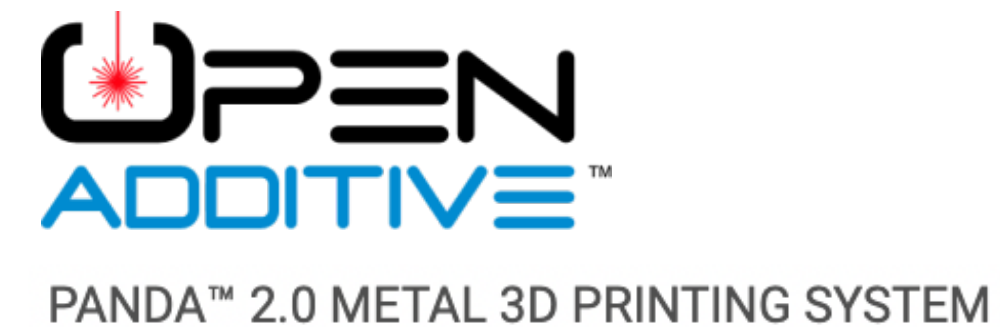
**TruTops Monitor & Monitoring
Analyser**



InfiniAM Central and InfiniAM
Spectral Software



Amp™ software platform



INDIRECT
COMPETITION
CHART

QUALITY
MONITORING FOR
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MANUFACTURING

COMPANY	SYSTEM NAME	DEFECT ANALYSIS	ROOT CAUSE ANALYSIS	DATA AGNOSTIC	MACHINE AGNOSTIC	REAL TIME MONITORING	DATA TRUSTING & SECURITY	MACHINE PREDICTIVE MAINTENANCE
Trumpf	TruTops Monitor & Monitoring Analyser	X						
SLM Solutions	SLM.Quality API							
Concept Laser (GE)	Amp TM Software Platform							
EOS	EOSTATE Monitoring software suite							
Renishaw	InfiniAM Spectral software							
Aconity 3D	AconitySTUDIO control software							
Velo 3D	Assure system							
Open Additive	AMSENSE® data collection and analysis platform	X						
Youbiquo	QIMAL	X	X	X	X	X	IDS CONNECTOR	PLANNED

BUSINESS TEAM



Pietro Carratu

Founder&CEO



Valentina Senatore

Business Development
Director



+7y Business Model & New
Product Development



HUAWEI CLOUD



Carlo Iorio

Founder&CEO



Project Coordinator



Scientific&Technical Director @
Business Incubator Micro-Nano Tech



Irene Masiello

Senior Business Consultant

Business Plan
Consultant



TECHNOLOGY TEAM



Luciano Magliulo

R&D Director

Capgemini Deloitte.

ANDERSEN

+25y Bus.Intelligence & Big Data

+30y System Integration



#1 Patent Inventor



Giovanni Basile

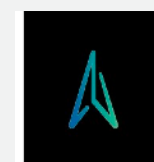
Senior SW Engineer

LEONARDO

+20y Full Stack. Dev

#3 Tech Start-up Founder

Guilds42



Federica Web Learning
Università di Napoli Federico II



Francesco Sabbarese

Data Scientist



UNIVERSITÀ DEGLI STUDI
DI SALERNO

+3y Machine Learning Models



HUAWEI CLOUD



Danilo Romano

Data Engineer



UNIVERSITÀ DEGLI STUDI
DI SALERNO

+12y Full Stack Dev.

+12y Big Data Specialist

+8y CI/CD Specialist

Federica Web Learning
Università di Napoli Federico II

BUSINESS MODEL
(B2B)

TARGET SEGMENT
& REVENUE MODEL

REACH

INDUSTRIAL AM SERVICE PROVIDERS

10-100 INDUSTRIAL MACHINE INSTALLED
EUROPE

Subscription Plan

Customer pays for the defect detection & root-cause analysis service. The subscription plan is **per machine** can be monthly or annual.

Setup fee (per model):

10.500 €

Subscription fee

- 3.400 €/mo
- 34.000 €/Y

GO-TO-MARKET

STRATEGY

REACH

1 ONLINE MARKETING



2 OFFLINE MARKETING



3 TRADE SHOW & EVENTS



MECSPE (IT), Formnext (G), IMTS (USA), RAPID + TCT (USA), AMUG (USA), TCT SHOW (UK), Airtec-Aero (G), Automotive Manufacturing Meeting (USA), Advanced Manufacturing Meeting Clermont Ferrand (FR), Aerospace & Defense Supplier Summit (USA).

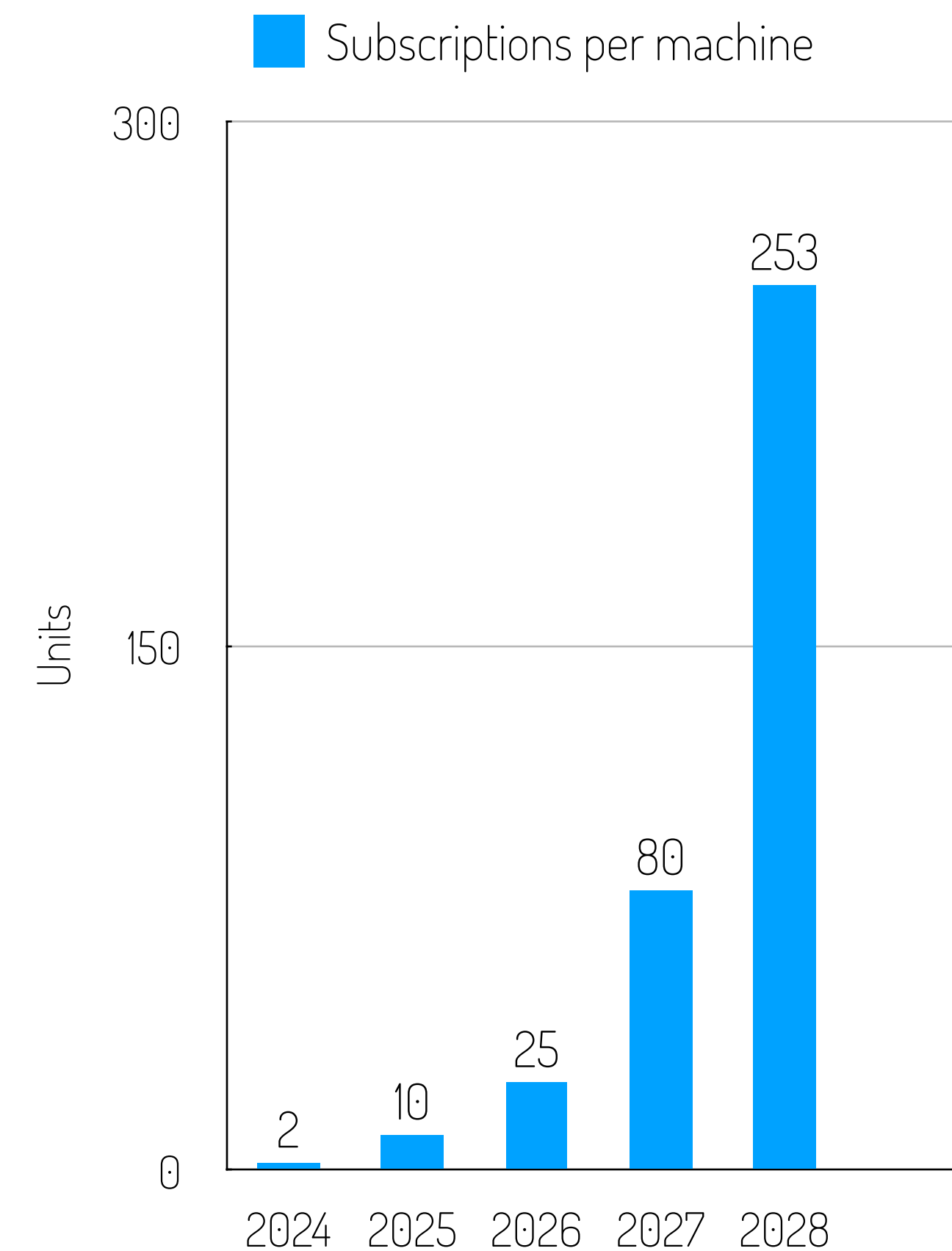
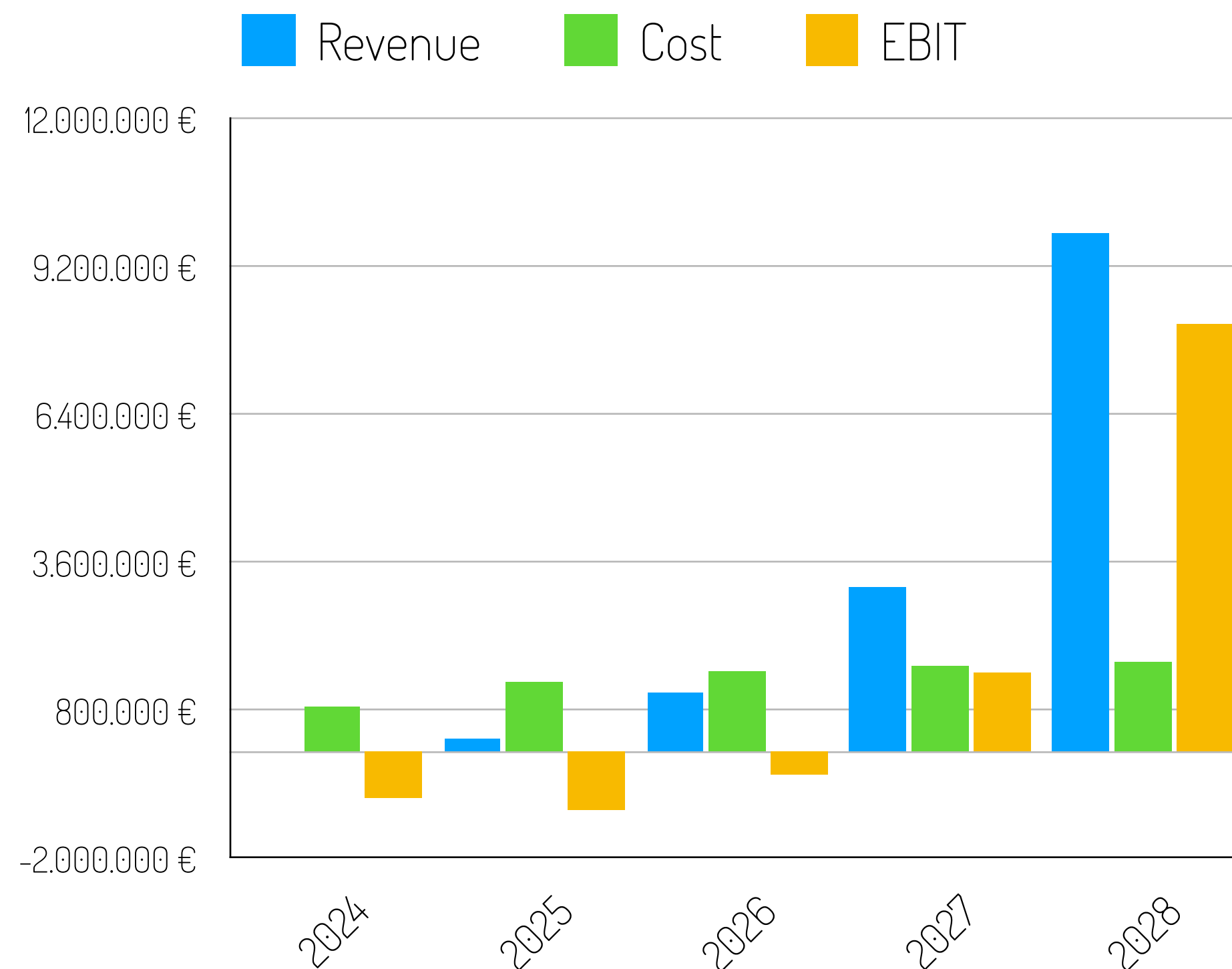
KEY FINANCIALS

REVENUES FORECAST



EBIT% @2028: >80%

BREAK EVEN @IVQ 2026

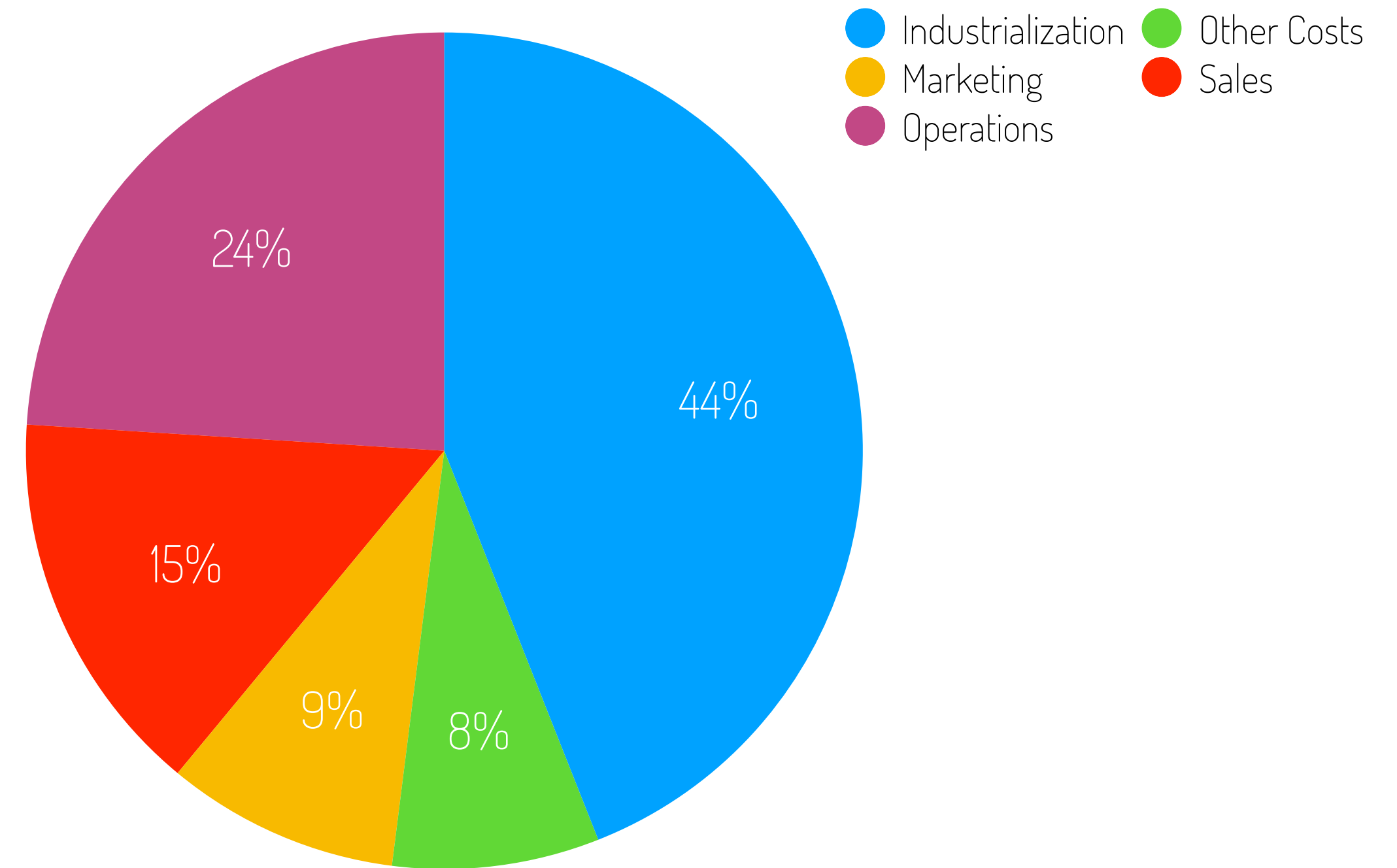


	Y1	Y2	Y3	Y4	Y5
Revenues (EUR)	€0	€263.520	€1.113.780	€3.115.500	€9.817.300
Costs	€868.043	€1.344.592	€1.547.261	€1.617.924	€1.701.924
EBIT	-€868.043	-€1.081.072	- 433.481 €	€1.497.576	€8.115.376

FUNDING NEEDS

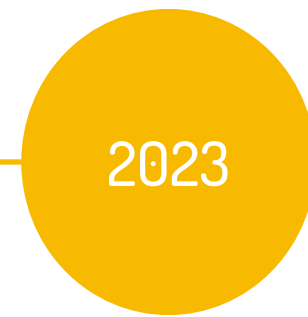


COST BREAKDOWN



INVESTMENT
TIMELINE

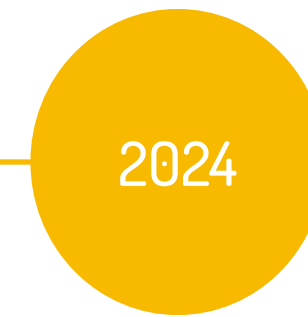
STRATEGY



2023

MVP

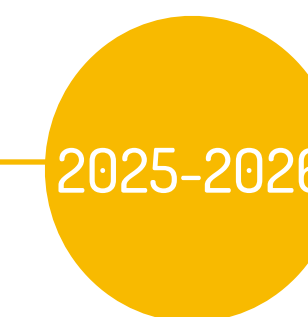
- Architecture definition
- TRL 5 achieved



2024

Dev & Piloting

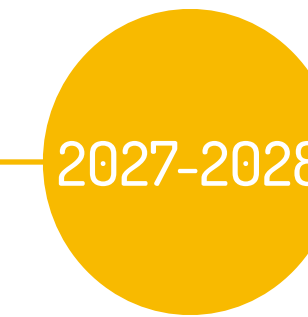
- Product validation
- Tested by 2 early adopters
- TRL/BRL 8 achieved
- Framework deployed



2025-2026

Commercial Launch

- #25 customers achieved
- Operative break even point
- TRL/BRL 9 achieved



2027-2028

Scaling

- #253 customers achieved
- 14 M€ Revenue
- EBIT >80%

Fund achieved
€ 80K REACH

Fund needed
€ 500K

Fund needed
€ 2.2M

Y O U B I Q U O

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Valentina Senatore, BDM

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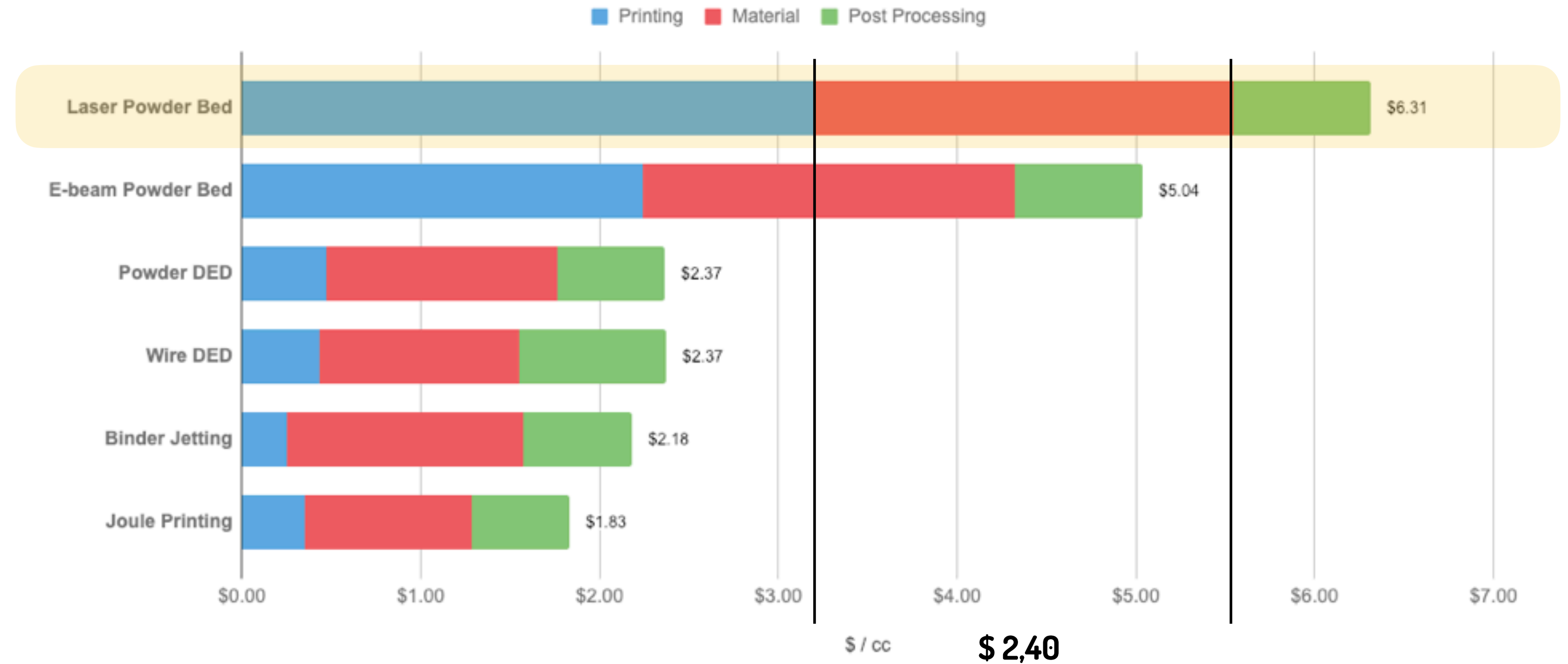
www.youbiquo.eu

FAIR VALUE PRICING

JOB COST

Digital Alloys' Guide to Metal Additive Manufacturing - Part 5
Economics of Metal Additive Manufacturing

Additive Manufacturing Costs for Titanium: \$'s Per Cubic Centimeter



	Metal	Polymer	Both
Pre-processing	10.2%	12.4%	10.2%
Printing	61.2%	62.9%	62.5%
Post-processing	28.6%	24.7%	27.3%

Source: Wohlers Associates

Material	Price estimate (per kg)
AlSi10Mg aluminum alloy	\$78
AlSi7 aluminum alloy	\$74
316-L stainless steel	\$88
17-4 PH stainless steel	\$78
Maraging steel	\$133
Ti-6Al-4V titanium alloy	\$363
Pure Grade 2 titanium	\$363
Inconel 718	\$145
Inconel 625	\$145

Source: Olaf Diegel

3D Metal Part Cost Example*:

$\$6,31 + 10\% = \$6,94 * 7000 \text{ cubic cm} = \$ 48.587 \text{ (Titanium)}$

$\$4,41 + 10\% = \$4,85 * 7000 \text{ cubic cm} = \$ 33.9570 \text{ (Aluminium)}$



*Including pre-printing, printing, material and post-processing evaluated on the same part the which data have been used for the MVP.

MARKET BASE PRICING



PANDA™ 2.0 METAL 3D PRINTING SYSTEM

Build configurations	<p>PANDA includes Open Machine Control™ (OMC), a powerful standard software featuring:</p> <ul style="list-style-type: none"> • User-friendly interface – intuitive GUI runs on included Windows 10 workstation • Full parameters control – set and adjust laser, hatch, contour, and <i>all</i> settings • Custom hatch strategies – Custom hatch strategies can be created directly or imported via dxf, cli, sli, or America Makes 4039 • Advanced processing tools – Advanced logic tools and fully programmable process flow enable unprecedented experimental design options, including excel DOE import capability • Plugin capabilities – Independently create and implement custom code for closed-loop feedback, new hardware, or other tools • Perpetual license – never expires and includes 3 years of upgrades as available <p>More information: See handout</p>
Laser delivery system	
Control software	
Process monitoring	
Ancillary equipment	
Service and support	
More resources	

https://openadditive.com/wp-content/uploads/2023/03/Open_Additive_PANDA_2.o_2023.pdf

PROCESS MONITORING OPTIONS (3rd party installations, non-PANDA)
(choose none, one, or more – 3rd party install fee, installation and training required)

AMS-RECOAT	AMSENSE recoat imaging sensor	\$15,000
AMS-TOMO	AMSENSE thermal tomography sensor	\$30,000
AMS-SPAT	AMSENSE spatter tracking sensor (comes with analytic/report)	\$30,000
AMS-heatCAM	AMSENSE LWIR camera for temperature sensing	\$45,000
AMS-Addiguru	AMSENSE Recoat analytics from Addiguru	\$1500/mth
AMS-CUST	AMSENSE custom analytic or sensor	inquire
AMS-3rdParty	3rd Party Integration Package (M290 and M400-1 currently supported)	\$15,000
AMS-TRAIN	Installation and training	\$7,500

NO HIDDEN COSTS – Prices include perpetual software license with 1 year of upgrades, as applicable; 1-year limited warranty and technical support. Extended warranty and service plans available, price depends on configuration. PANDA prices include shipping, handling, and travel to the 48 contiguous United States. Visit our online pricing/configuration tool at <https://tinyurl.com/buildmypanda>. Prices subject to change without notice.

COMPETITION



TRACTION



#2

Pilot early adopters in 2024

KEY METRICS

POC DEPLOYMENT



BUSINESS MODEL
(B2B)

TARGET SEGMENT
& REVENUE MODEL

REACH

INDUSTRIAL AM SERVICE PROVIDERS

10-100 INDUSTRIAL MACHINE INSTALLED
EUROPE

Subscription

The subscription plan is **per machine** and can be monthly or annual.

Setup fee (per model):

10.500 €

Subscription fee

- 3.400 €/mo

- 34.000 €/Y

Pay-per-use

The pay-per-use plan is **per machine** and it is per job.

Setup fee (per model):

10.500 €

Pay-per-job fee

-800 €/job

BUSINESS MODEL

DISTRIBUTION CHANNEL



ORIGINAL EQUIPMENT
MANUFACTURERS

Royalty/Service Fee

Customer pays to integrate the defect detection system in their solutions on the number of 3D machine sold,

AM INDEPENDENT SW
VENDORS

Co-Marketing

BUSINESS MODEL

KEY PARTNERS



END-USER - INDUSTRIAL

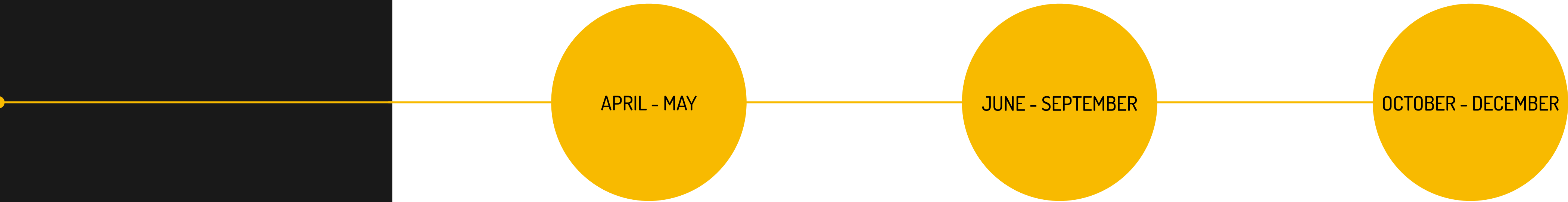
UNIVERSITIES & RESEARCH ORGANIZATIONS

ORIGINAL EQUIPMENT MANUFACTURERS

AM INDIPENDENT SW VENDORS

PROJECT TIMELINE

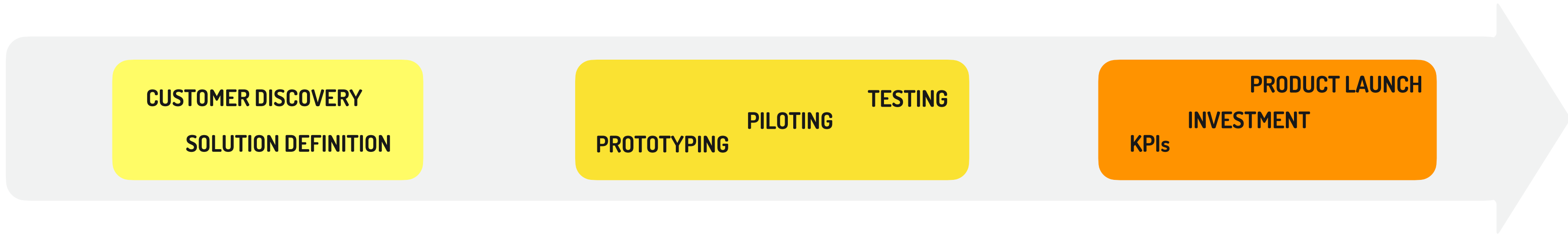
REACH CHALLENGE TRACK 1



MOCK UP

MVP

MARKET



FINANCIALS

YOU B I G U U

SUMMARY TABLE



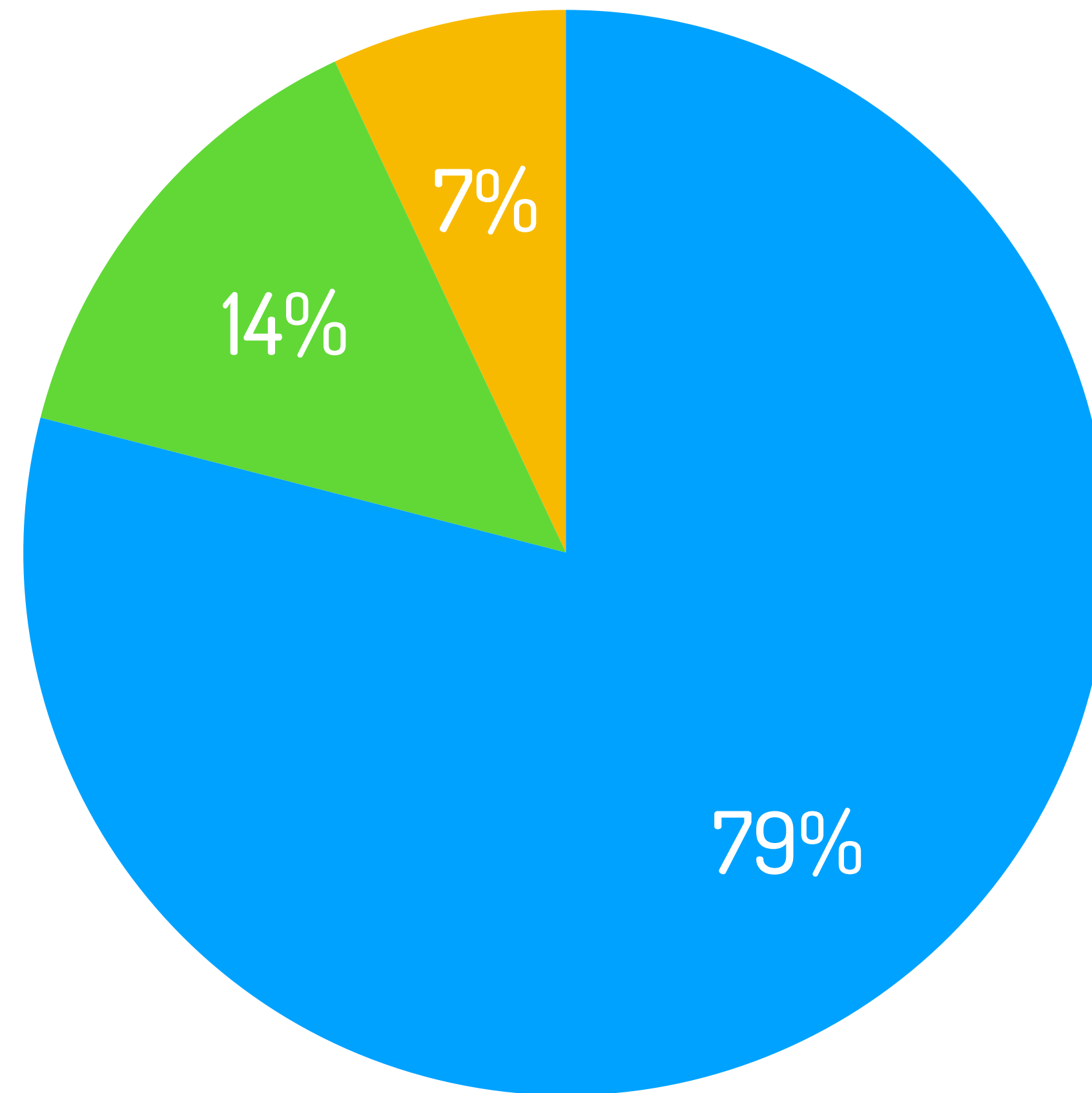
Revenues	M6	M12	M18	M24	M30	M36	M42	M48	M54	M60
MRR	0 €	0 €	7 €	37 €	71 €	94 €	168 €	299 €	535 €	946 €
Cumulative revenues	0 €	0 €	22 €	121 €	461 €	1.045 €	1.862 €	3.359 €	6.005 €	10.725 €
Monthly OPEX	66 €	78 €	103 €	114 €	116 €	120 €	122 €	125 €	129 €	132 €
Sales & Marketing	0 €	9 €	14 €	18 €	18 €	18 €	18 €	18 €	18 €	18 €
Tech & Product	57 €	60 €	66 €	66 €	63 €	63 €	63 €	63 €	63 €	63 €
Support & Onboardin	0 €	0 €	0 €	6 €	6 €	9 €	6 €	9 €	6 €	9 €
Other	9 €	9 €	23 €	24 €	29 €	30 €	35 €	35 €	42 €	42 €
Cumulative OPEX	396 €	868 €	1.521 €	2.213 €	2.977 €	3.760 €	4.559 €	5.378 €	6.219 €	7.080 €
FTE Costs	57 €	69 €	90 €	101 €	101 €	104 €	103 €	106 €	103 €	106 €
%OPEX	86%	88%	87%	89%	87%	87%	84%	85%	80%	80%
FTE	10	13	17	20	19	20	19	20	19	20
Founder (CEO & Tech & Product	1	3	4	5	5	5	5	5	5	5
Support & Onboardin	0	0	1	3	3	4	3	4	3	4
Cash Analysis										
Cash inflow	0 €	0 €	7 €	29 €	70 €	103 €	180 €	308 €	558 €	984 €
Cash outflow	71 €	84 €	109 €	120 €	127 €	131 €	133 €	136 €	140 €	143 €
Cumulative burn	384 €	856 €	1.484 €	2.076 €	2.493 €	2.692 €	2.672 €	1.993 €	181 €	-3.678 €

FINANCIALS

TOTAL COSTS FOR
5 YEARS PLAN



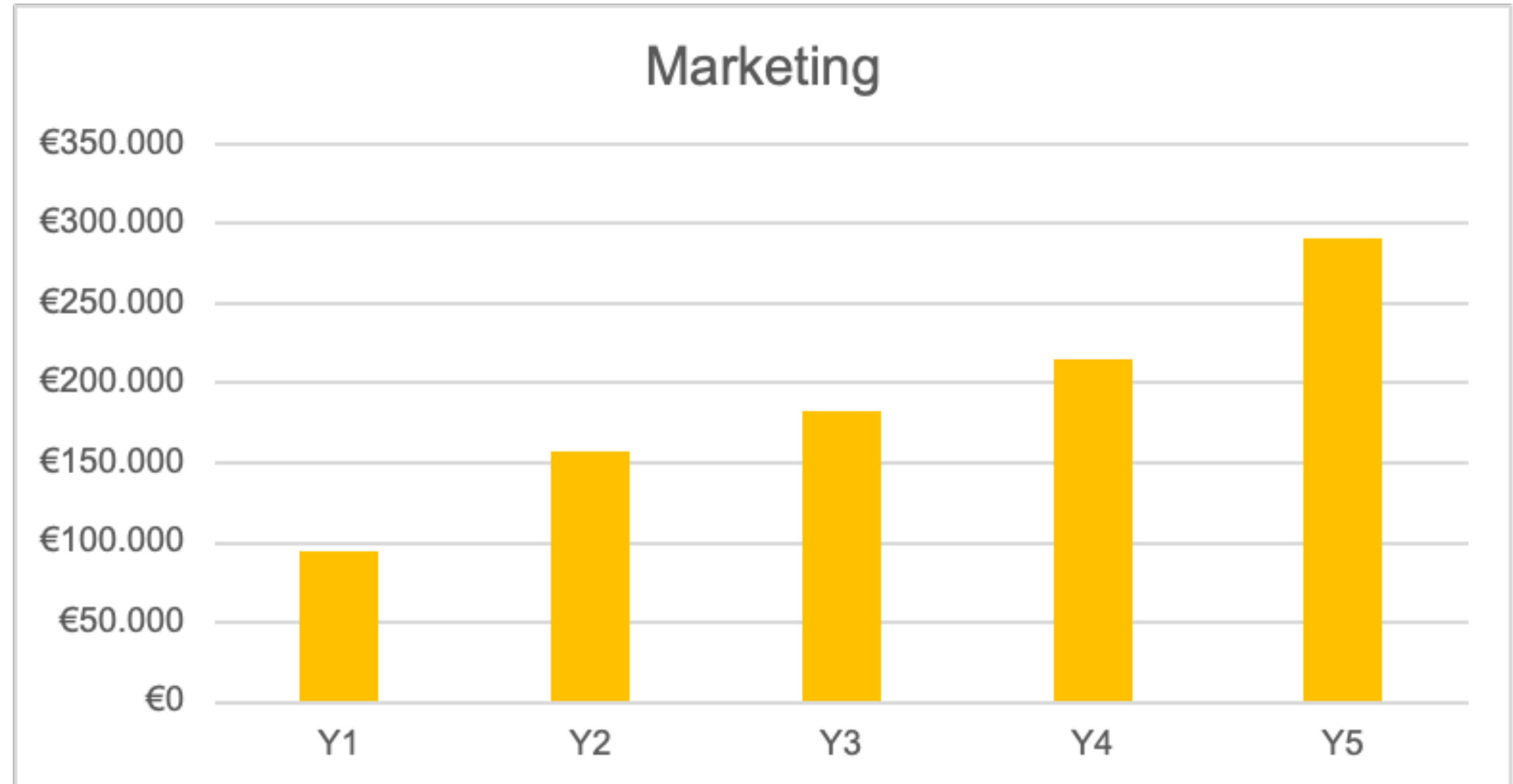
- Personnel
- Supplies and Services
- Sales&Marketing



FINANCIALS



MKT COSTS

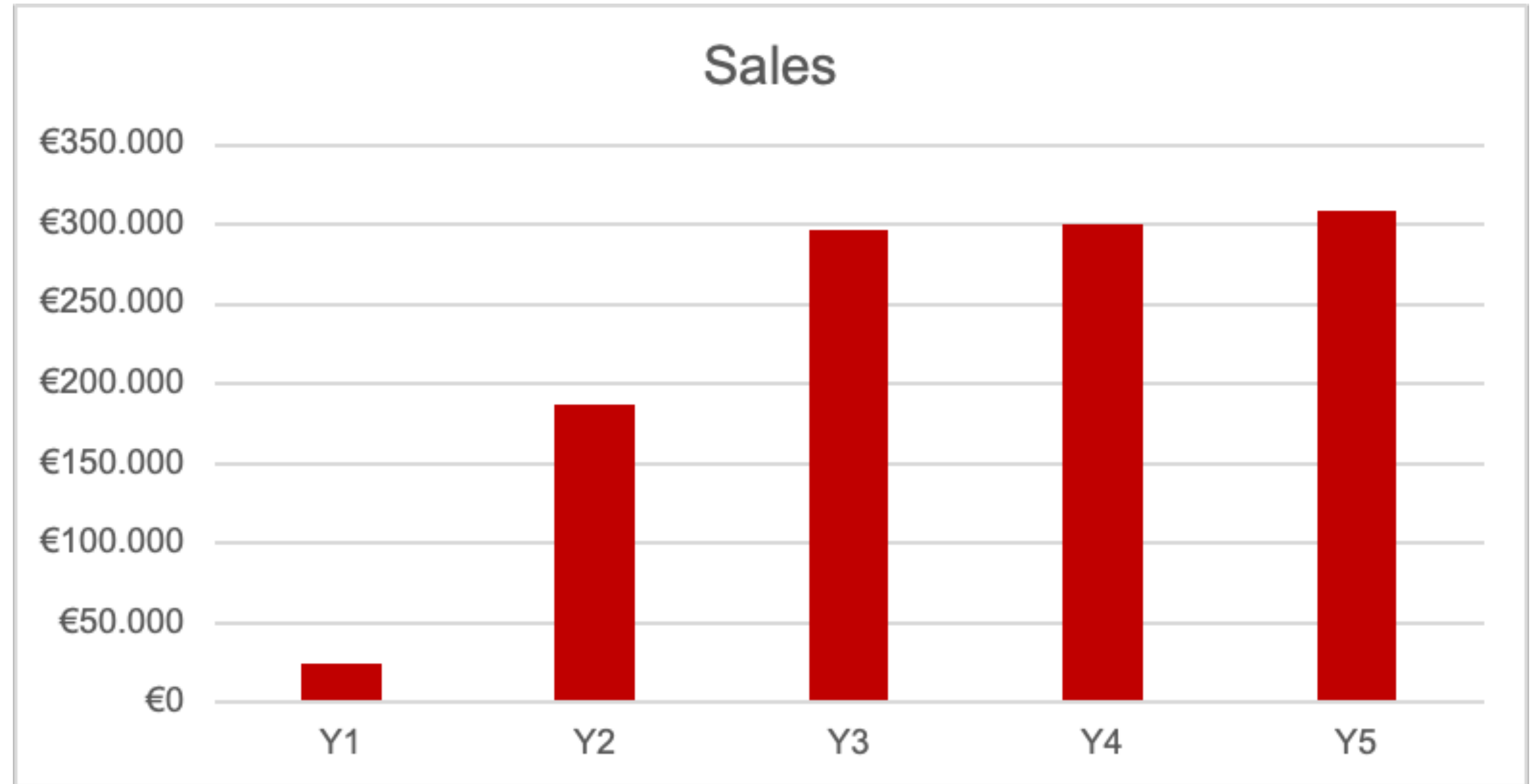


FINANCIALS

YOUBIQUO

SALES COSTS

REACH



FINANCIALS

Y O U B I Q U O

GROWTH AND CHURN RATE



Sales Begin		M13
Customer		
Customer Distribution		100%
Growth S3		20%
Growth S4		25%
Growth S5		20%
Growth S6		10%
Growth S7		15%
Growth S8		15%
Growth S9		15%
Growth S10		15%
Churn S3		5%
Churn S4		5%
Churn S5		5%
Churn S6		5%
Churn S7		5%
Churn S8		5%
Churn S9		5%
Churn S10		5%
Sales		
Sales focus		100%
Sales cycle (months)		6