

# Avio Presentation Star Conference, Milan

MARCH 22<sup>ND</sup>, 2023



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# Agenda

- **Avio profile**
- Market updates
- Business update
- Financials

# Avio : propulsion for space and defence



European heavy launcher  
(10.5 tons in GTO)

**Avio: Strap-on boosters**

**250 € Mln**  
Mkt Cap  
**~45%**  
Free Float



**1,200**  
Employees  
**4%**  
Mgmt Share



**Ariane 6**

**NEW 2023**



**Tactical Propulsion Systems**



**Vega C**

**NEW 2022**

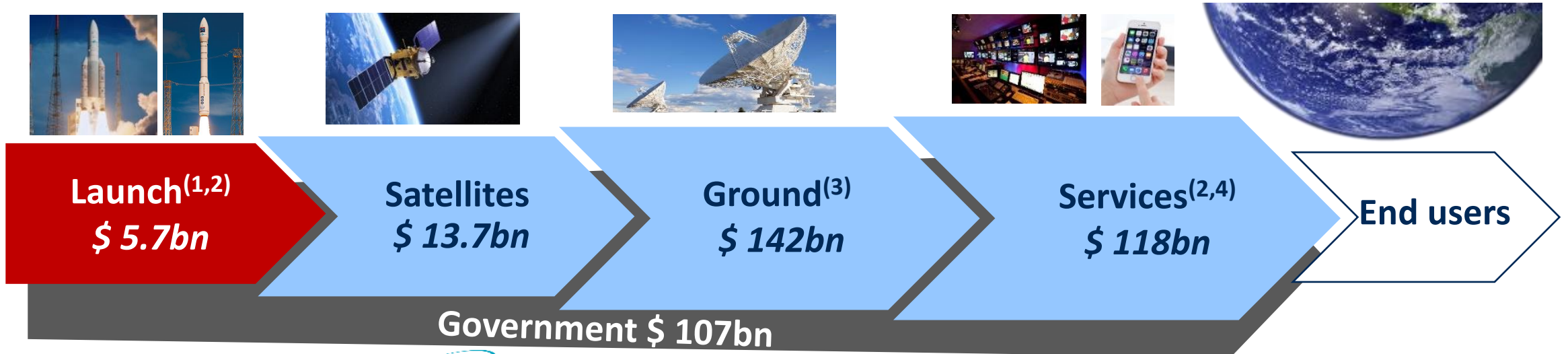


European light launcher (2.3 tons in LEO)

**Avio: System integrator**

# The launch segment : the gateway to the Space economy

## Global space value chain (2021)



**Launch:** arianespace, SPACE, ULA (United Launch Alliance), ISRO

**Satellites:** ThalesAlenia Space, OHB, AIRBUS DEFENCE & SPACE, SSL (A MAXAR COMPANY), BOEING, LOCKHEED MARTIN

**Ground:** Telespazio (A Finmeccanica/Thales Company), Together ahead. RUAG, Panasonic, TCS TeleCommunication Systems (Enabling Convergent Technologies®)

**Services:** iridium®, eutelsat, SES (beyond frontiers), planet., ORBCOMM, OneWeb, DigitalGlobe, NASA, NOAA (NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION U.S. DEPARTMENT OF COMMERCE)

**End users:** vodafone, sky, bp, DHL, TOMTOM, LDC (Louis Dreyfus Company)

Source: Satellite Industry Association (2022)

(1): Includes launcher manufacturing and launch service activities  
(2): Commercial services revenues only

(3): Includes GNSS chipsets and Related  
(4): Includes commercial humanflight

# Global customer base



NOT EXHAUSTIVE

● = Ariane 5

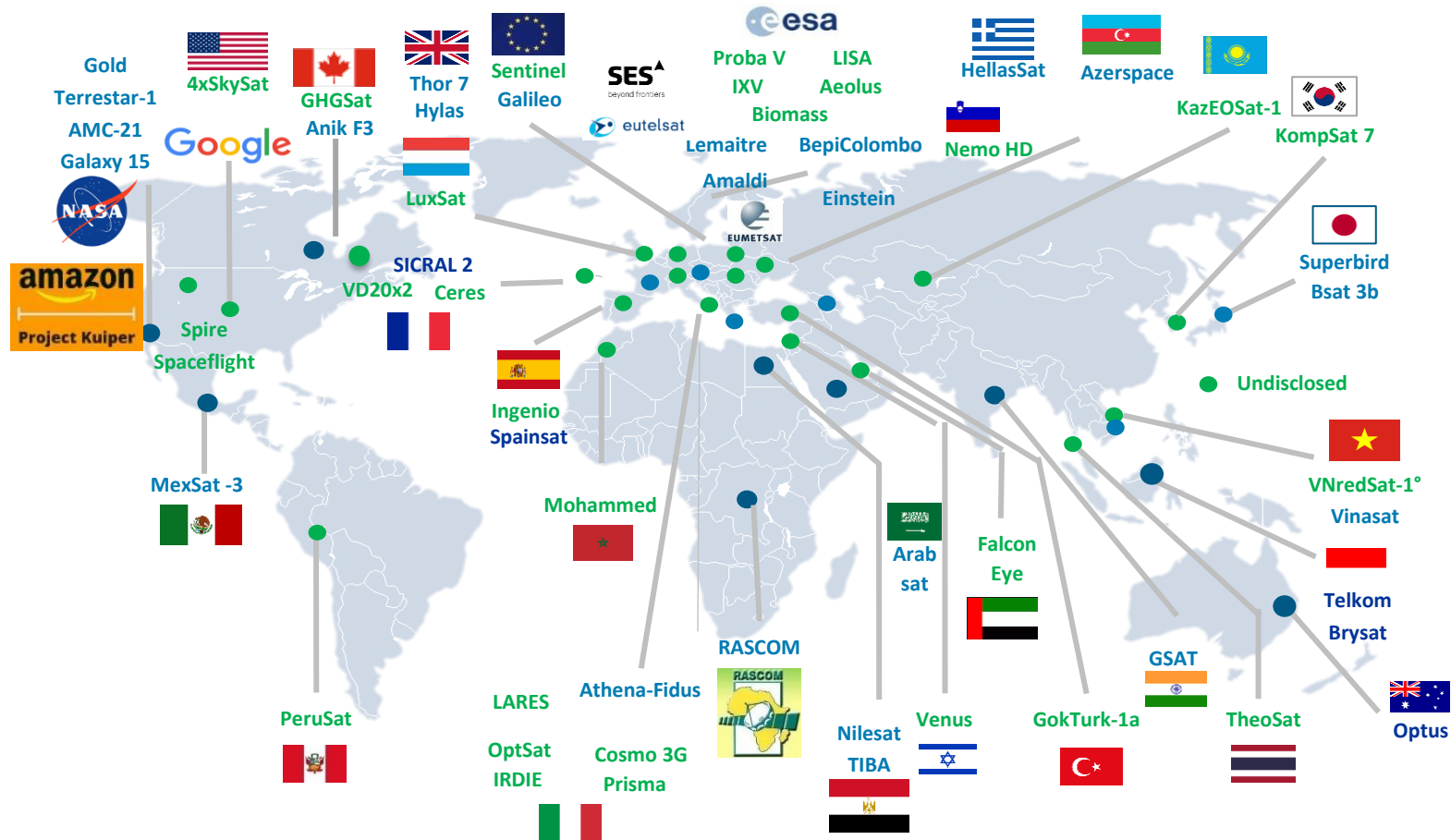
● = Vega



Ariane 5



Vega




# Industrial operations in Europe and French Guyana




Main stage integration



Propellant casting

 Colleferro, Rome  
(GMT +1) N41.727 E13.0030

- SRM design, production
- Mission analysis
- Flight Software
- Stage integration
- Testing

 French Guiana  
(GMT -3) N4.003 E52.999

Avio runs three facilities at the European Spaceport :

- SRM casting and integration
- Vega launcher operation

 Paris  
(GMT +2) N48.856 E2.351

Large SRM design/integration



SRM Manufacturing



Upper stage integration



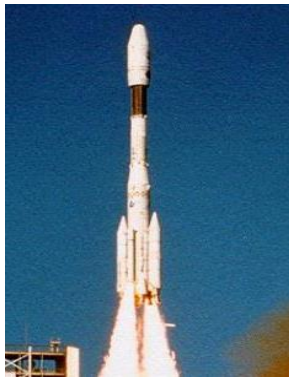
# 55 years of track record in Space launch

## Avio Product history



**Ariane 1-3**

*Separation engines*



**Ariane 4**

*9 tons Boosters*



**Ariane 5**

*230 ton Boosters*



**Vega**

*Complete launch system*



**Vega C**



**Ariane 6**

*Two launch systems with a common first stage engine*



**IFD**



**Space Rider**



**Vega E**

*Coordinated family of products and applications*





# Agenda

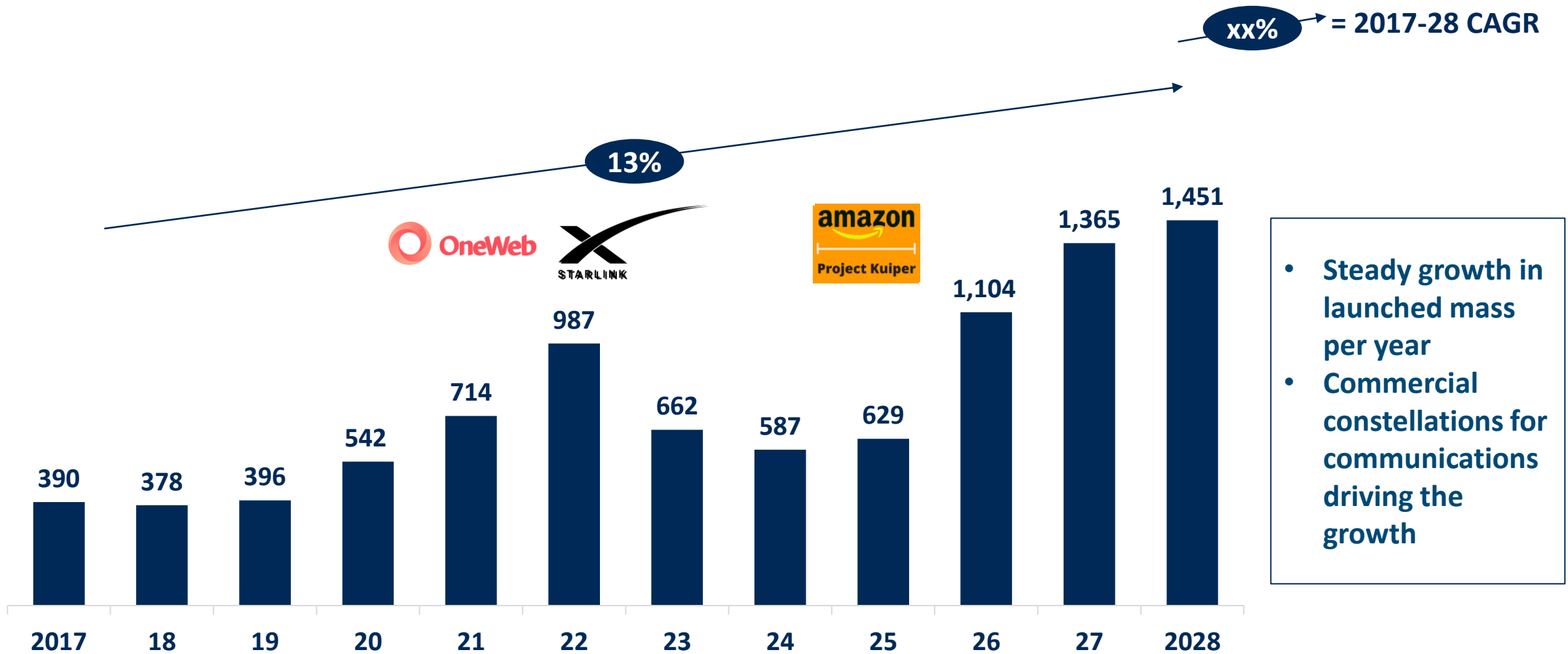
- Avio profile

- **Market updates**

- Business update

- Financials

# Steady growth in launch rates and launched mass at global level



# Future launch market value is concentrated on Government LEO sats

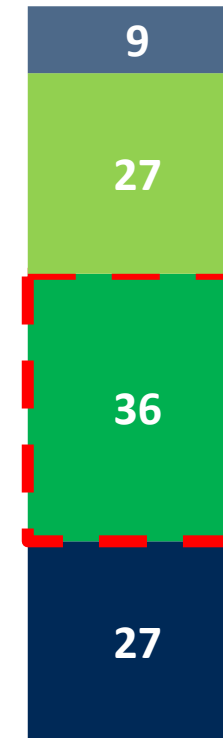
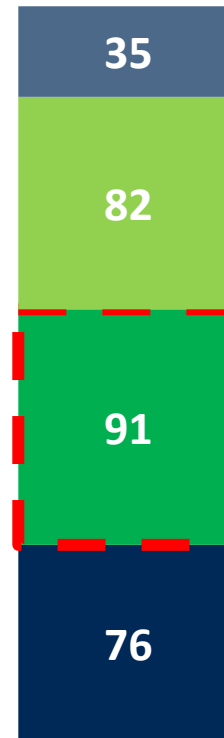
2022-2031 Expected satellite market by operator type

== = Vega C/E  
Target market

100%=8,954 Tons

100%=284 \$ Bln

100%=99 \$ Bln



Mass in tons

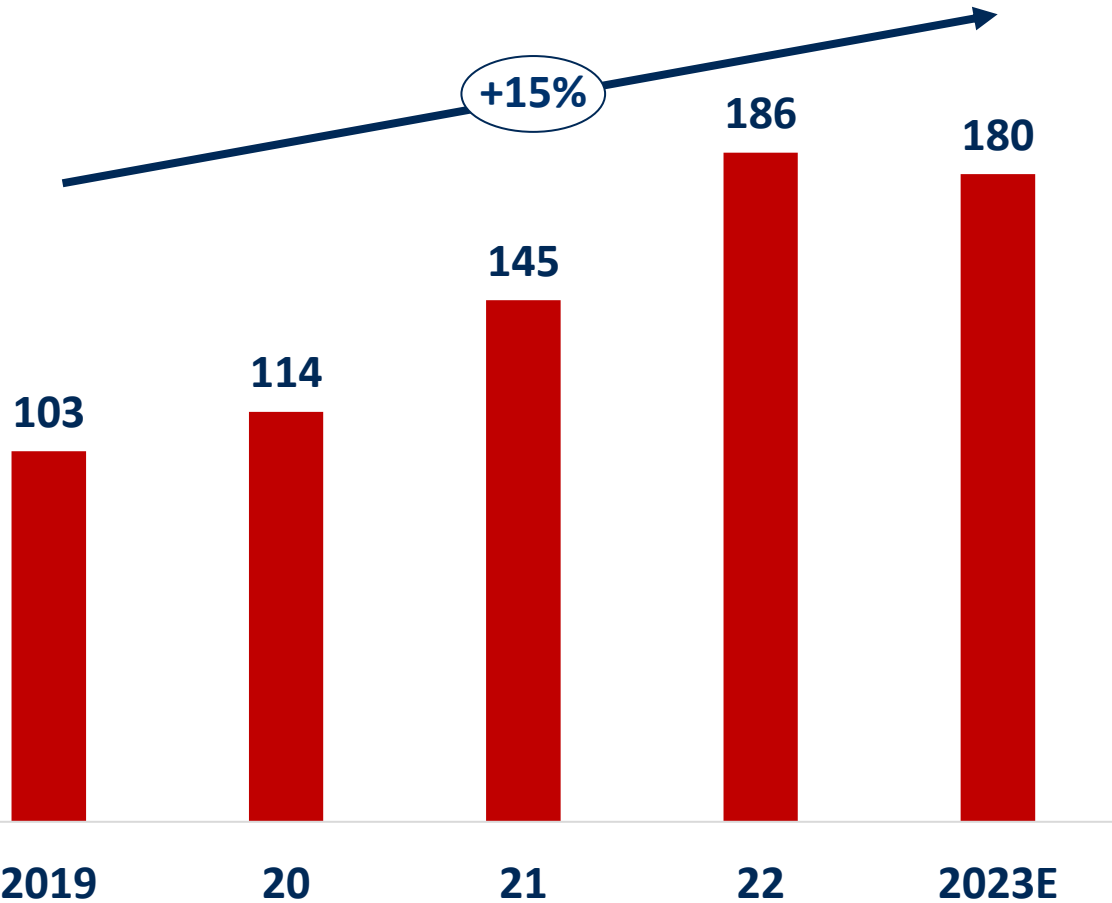
Sat Value

Launch Value

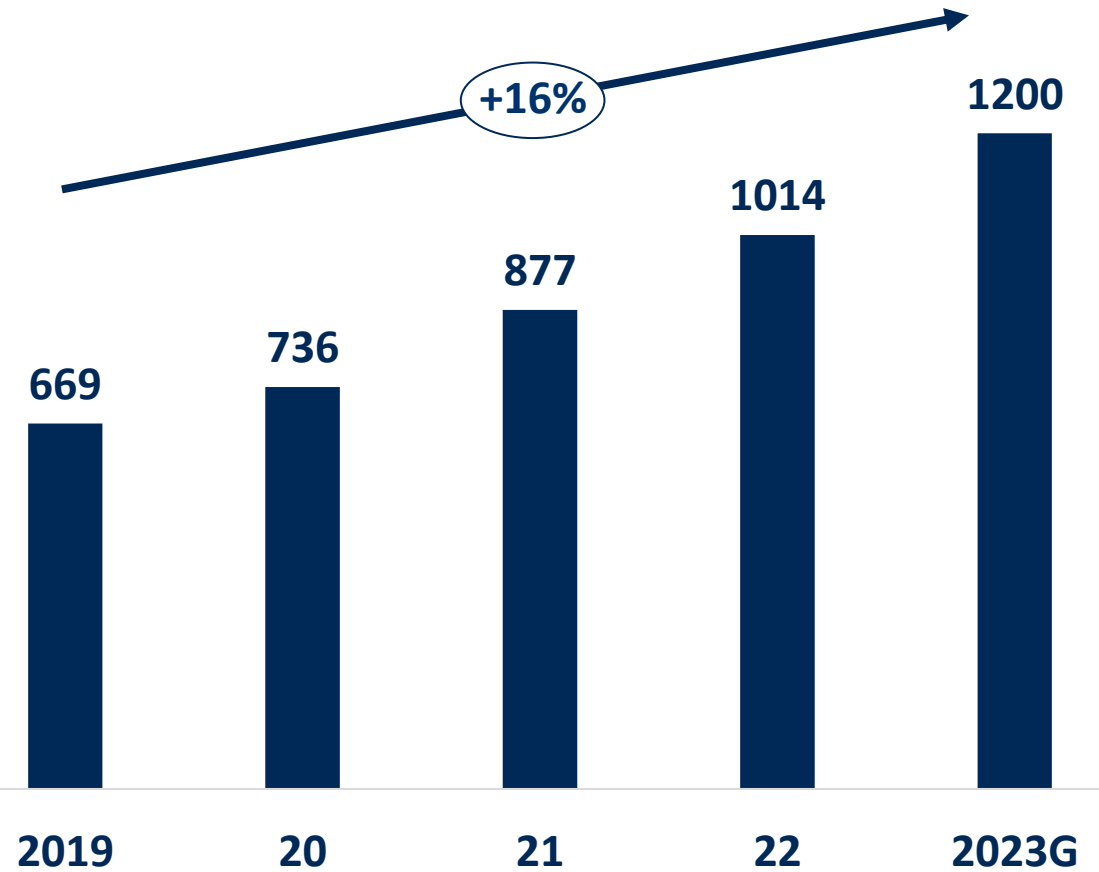
■ Commercial LEO ■ Government LEO ■ Government non-LEO ■ Commercial GEO

# Evolution of the number of global launches and Avio backlog

# of orbital launches



Avio Net Order Backlog evolution 2019-2023E (€ - M)



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# 2022-23 flight schedule



2022

2023

Measat 3D



Galaxy 35  
Galaxy 36

MAXAR



JUICE



Syracuse 4B



H2Sat



VA257  
June

VA258  
September

VA259  
December

VA260  
April

VA261  
Summer

A6 MF  
EoY Ariane

Vega C Maiden Flight preparation activities

Lares 2



2 Pléiades  
Neo



VC01  
July

VC02  
December

VG21  
Summer

VC03  
EoY Vega



SOURCE: ESA, Arianespace, Press search

# Successful Vega C Maiden Flight : a boost for its commercial appeal



Vega C



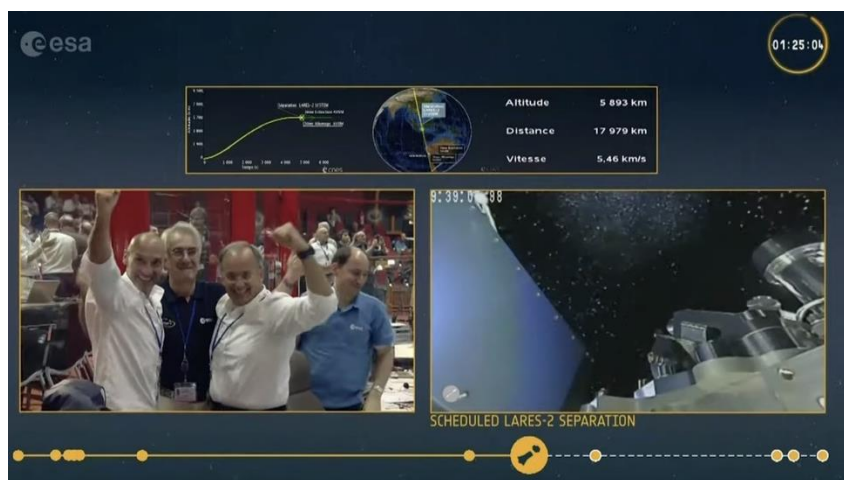
Vega C lift-off



Stage separation



Mobile gantry visit



Mission Success : reached 5,893km altitude



Lares 2 satellite orbital injection



Payload fairing separation



# Launchers reach product maturity after ~30 flights



Vega/Vega C



Ariane 5



Falcon 9



Soyuz



GSLV



Electron (R.Lab)



H2



L1 (V. Orbit)



Astra



Firefly Alpha

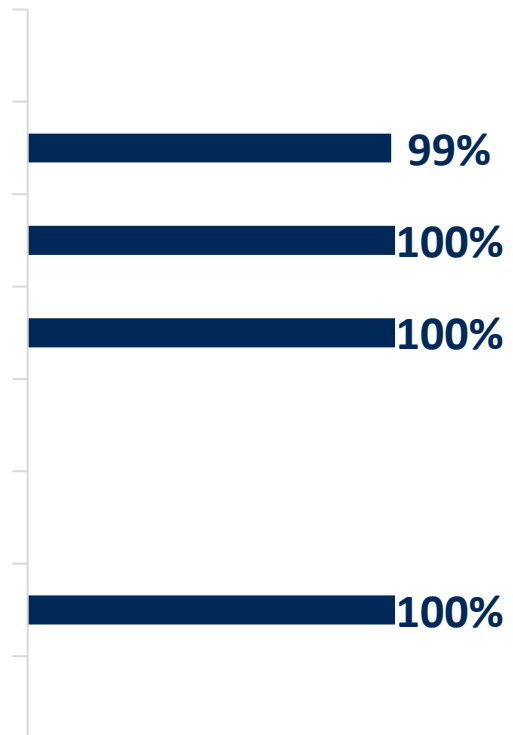


ABL Launcher



## Reliability launch 1-30

## Reliability launch 30-onwards



New launchers suffered from high failure rates within the first few launches





# VC02 anomaly and path to return to flight

## Independent Enquiry Commission findings

- VC02 anomaly caused by an **over-erosion of the Z40 Carbon-Carbon nozzle throat insert** likely due to the inhomogeneity/weakness of the material
- The acceptance criteria used were not sufficient to detect the type of defect. However, **no weakness of Z40 design** has been revealed.
- **The launcher Safety System (SAS) behaved nominally**
- **The failure does not affect the Vega launcher** (with uses different material for Z23), which **will return to flight by the summer.**
- **Vega C launcher will return to flight by end 2023** with new C-C material (already ordered and in delivery now), after a static firing test of Z40
- A robust **Return-to-Flight plan** has been defined by the Commission. The European Space Agency announced a dedicated program to cover costs, funded with **~30M € drawn from available ESA funds**
- Risks associated with implementation of RtF plan accounted for within risk provisions in Avio accounts

*Nozzle throat*

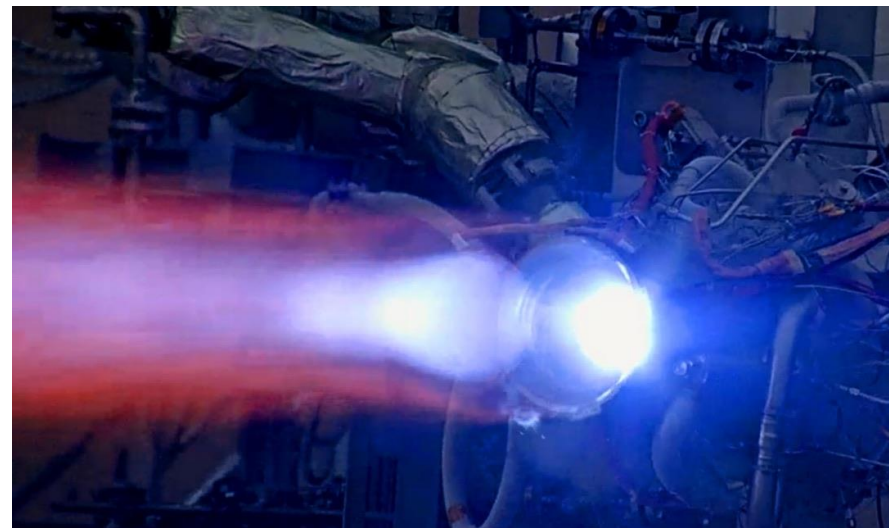


**Z40 Nozzle**

# Successful tests of Vega E's M10 : 1<sup>st</sup> LOX-Methane engine in Europe

## Vega E:

- M10 engine first prototype (DM1): first 24 firings completed in summer 2022
- More than 1,300 seconds of cumulative testing, all successful
- Development at completion funded at ESA 2022 MC
- Second set of static firing tests on development model 2 (DM2) in 2023

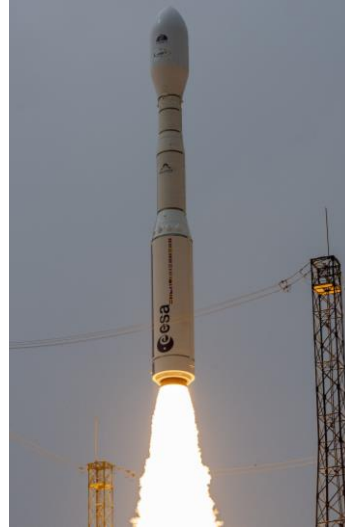
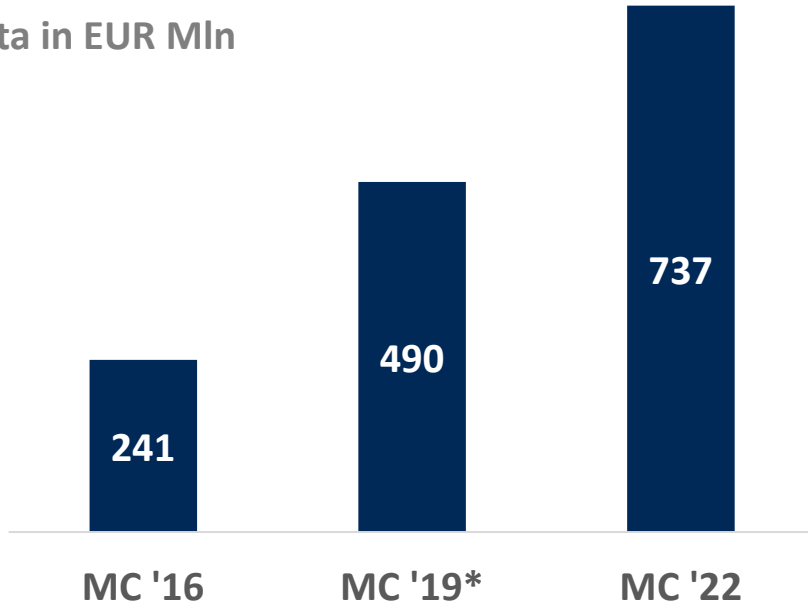


# 700M € of new developments from ESA for new launcher products



## ITA Launchers budget in ESA

Data in EUR Mln



Vega C Adaptation Vega E Completion



P120C Performance upgrade



Space Rider at completion



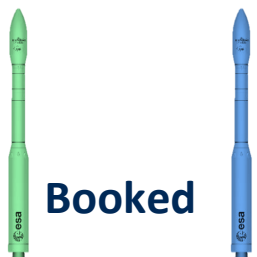
Re-usable upper stage

**€700 Mln new orders expected for Avio starting from 2023**



\*As announced at the 2019 ESA MC  
SOURCE: ESA and ASI

# Arianespace reached record-level backlog for Vega/Vega C



Booked



Under negotiation



Prospect identified

Launch contracts in backlog:

- ~20% Commercial/Export customers
- ~80% European Institutional Customers

2

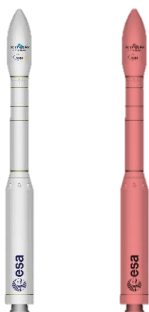
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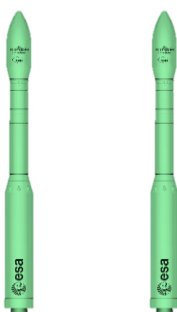
4-5

4-5

4-6



2022



2023



2024



2025



2026



2027



# Ariane 6 Maiden Flight slipped to the end of 2023



**Ongoing A6 combined tests in Kourou**



**Hot firing test of the A6 upper stage in Lampoldshausen, Germany, October 2022**

**ESA-Ariangroup Press Briefing on October 2022 highlighting main upcoming milestones before Maiden Flight:**

- Successful completion of Vinci test in Germany**
- Successful Vulcain test and combined tests in French Guiana**
- System Design review before launch**

# “Next Gen EU” projects to develop next-gen launcher technology

**NEXT  
GEN  
EU**



Ministero delle Imprese  
e del Made in Italy



## Space Transportation Systems (STS) : €185 M

- Technological demonstrator of a LOX-Methane powered two stage to orbit small launcher
- Two experimental launches (single stage and two stage respectively)
- Composite cryo tanks, simplified Avionics (software-based) and non-pyro separation systems

## High Thrust Engine (HTE): €100 M

- 60ton thrust class LOX-Methane engine
- Innovative thermodynamic cycle, delivering high specific impulse



# Incremental orders in the defense business anticipate further growth

## ASTER 30 Booster



**MBDA**  
MISSILE SYSTEMS



### Medium-Range Air Defense:

- More than 2,000 units produced to date
- New Production Orders expected in H1 2023 >€ 80 M
- Additional demand in the coming years requiring extended production rate

## CAMM-ER SRM



**MBDA**  
MISSILE SYSTEMS



### Short Range Air Defense:

- First Production Contract for IT MoD signed in Q1 2023 >€ 20 M
- Additional opportunities expected to be finalized within FY 2023

## Teseo Mk2E Booster



**MBDA**  
MISSILE SYSTEMS



### New Anti-Ship Missile:

- Development contract signed in FY 2022 for >€ 10 M

## Undisclosed

### New Initiatives:

- Research Program ongoing for a new training system
- R&D for innovative propulsion systems for new European Defense Programs

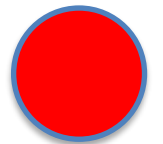
# Avio : medium-term opportunities outweigh short-term challenges



## Opportunities

- Vega C+/Vega E/Space Rider roadmap defined and funded at ESA MC 2022
- Vega backlog full until 2027
- Robust Ariane 6 flight backlog
- Defense business growing
- PNRR unique opportunity to strengthen product/technology base (STS, HTE) for competitiveness in the long term

## Challenges



- P120 slower than expected ramp-up in 2023-24 due to Ariane 6 delay
- Vega C Return to flight post VV22 to slow down Vega production for 2023
- Energy prices and inflation volatility continues



# FY 2023 Guidance

<ul style="list-style-type: none"><li>• Net Order Backlog</li></ul>	<ul style="list-style-type: none"><li>• Min €1,150M</li><li>• Max €1,250M</li></ul>	} <ul style="list-style-type: none"><li>• New orders expected for both development and production</li><li>• ESA MC 2022 subscriptions and Italian PNRR contracts to turn into backlog</li></ul>
<ul style="list-style-type: none"><li>• Net Revenues</li></ul>	<ul style="list-style-type: none"><li>• Min €330M</li><li>• Max €350M</li></ul>	} <ul style="list-style-type: none"><li>• New development projects ramp-up (Vega E, Space Rider, VegaC+, liquid propulsion)</li></ul>
<ul style="list-style-type: none"><li>• EBITDA Reported</li></ul>	<ul style="list-style-type: none"><li>• Min €19M</li><li>• Max €25M</li></ul>	} <ul style="list-style-type: none"><li>• Enduring impact of inflation and under-absorption of fixed costs due to reduced production</li><li>• Estimated impact of 6M non-recurring costs*</li></ul>
<ul style="list-style-type: none"><li>• Net Income</li></ul>	<ul style="list-style-type: none"><li>• Min €2M</li><li>• Max €6M</li></ul>	} <ul style="list-style-type: none"><li>• Marginal effect of financial charges and taxation</li></ul>

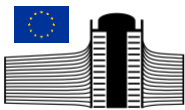
# Outlook beyond 2023



Increasing backlog and net cash position **support expectation for double-digit revenue growth in 2024-27**



Market **demand growing more than anticipated** (2X market growth by 2031) in both space launch and tactical propulsion – **full commercial backlog for Vega, Ariane and Aster**



**Secured EU and ESA institutional funding support** across the decade for both Ariane and Vega development and production support activities



PNRR (Next Gen EU) projects providing additional opportunity for **new strategic technologies and products** focus on **liquid propulsion** to open new markets



Further opportunities coming for **defense and tactical propulsion** systems due to the evolution of the geo-political situation



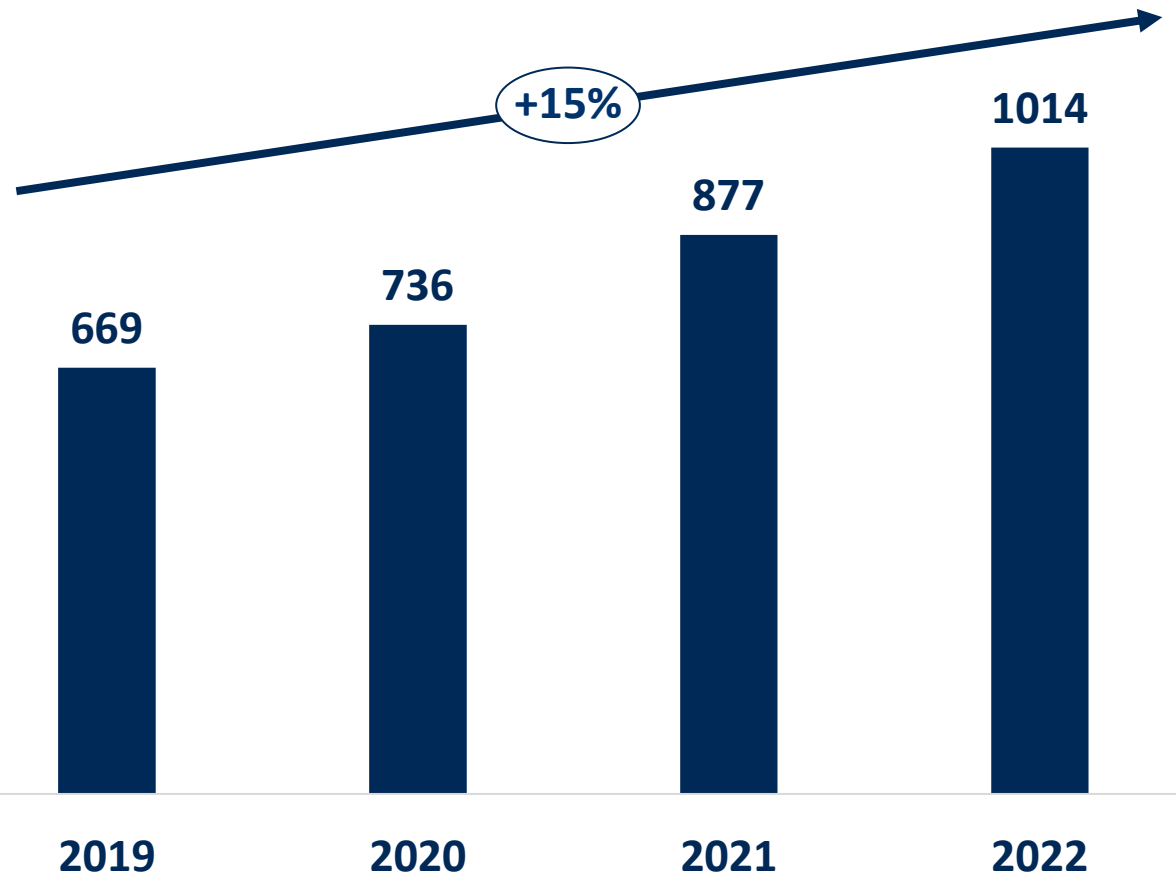
Improved scenario for **energy prices but still challenging for inflation**

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- **Financials**

# Net order backlog evolution 2019-2022

Net Order Backlog evolution 2019-2022 (€ - M)



## Comments

New contracts signed in 2022 for ~€500M include:

- Vega C Production B4 procurement and improvement program (~€200M)
- Vega C/E Development including PNRR contracts (~€80M)
- P120C production and development (~€100M)
- Tactical production and development (~€50M)

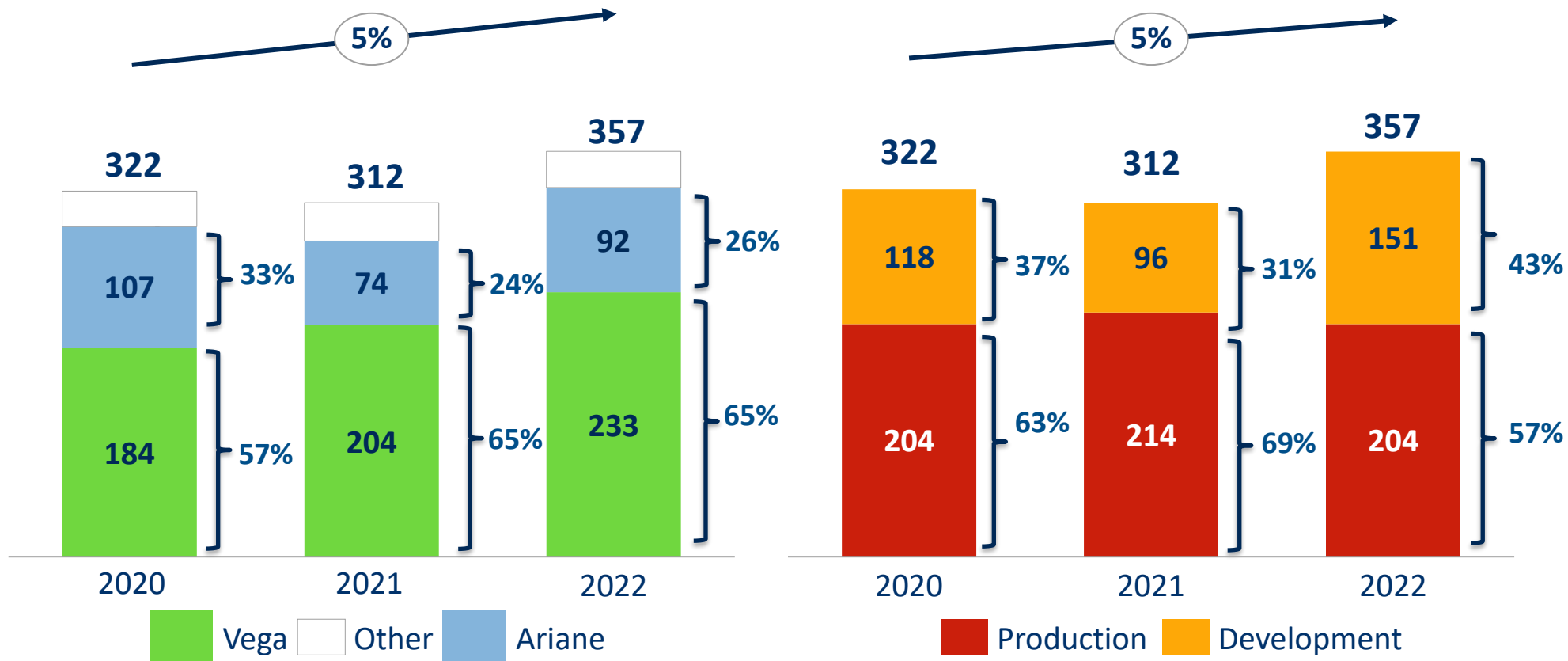
Order intake does not include:

- Next Gen EU/PNRR signed yesterday for >285 € M
- Effects of 2022 ESA Ministerial Council

# Net revenues evolution 2020-2022

by Line of Business (€ - M)

by Activity (€ - M)



Net Revenues higher than prior year for increase in Vega development and P120C activities, partially offset by lower Ariane 5 Production in phase-out

# FY 2022 results vs 2021 and 2020

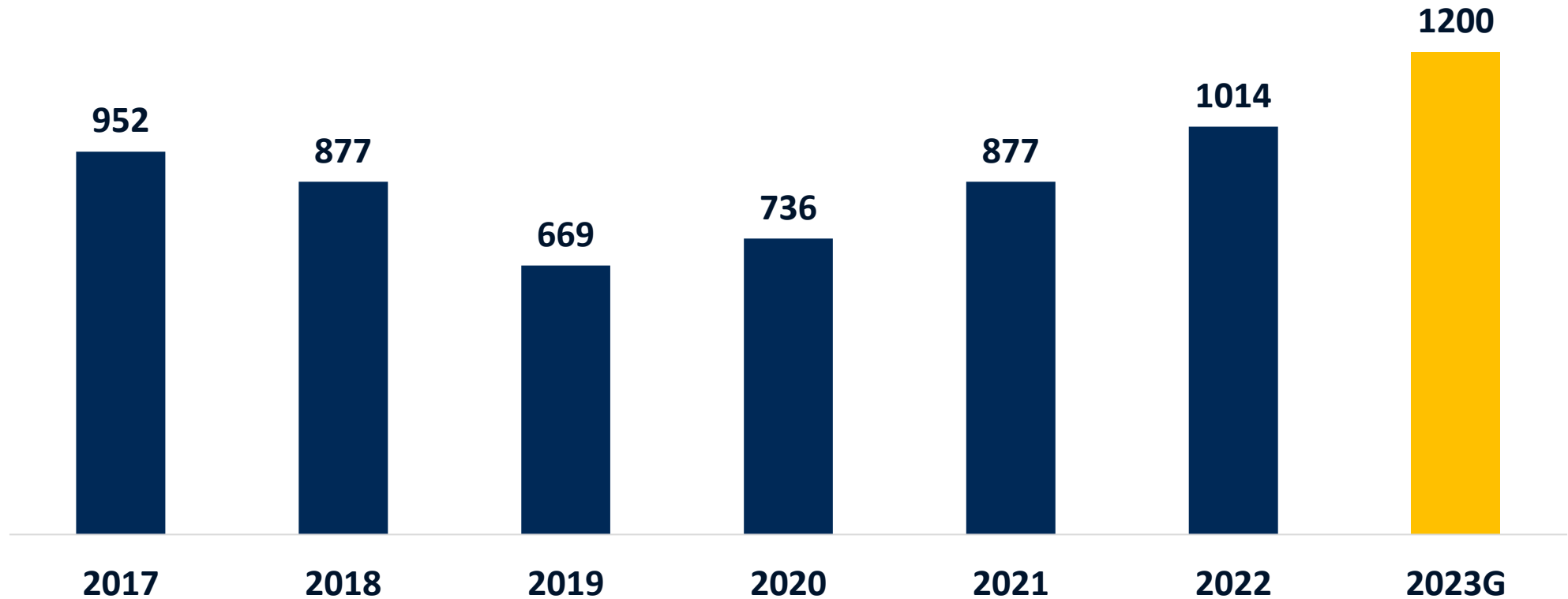
	FY 2020	FY 2021	MAIN ECONOMICS	FY 2022	Comments
	€ - M	€ - M		€ - M	
	322,0	311,6	NET REVENUES	357,3	<ul style="list-style-type: none"> <li>Increase in revenues driven by development of Vega C, M10 engine for Vega E and Space Rider</li> </ul>
N/R 8.1	35,2 11,3%	30,0 8,4%	EBITDA REPORTED % on net revenues	21,4 6,0%	<ul style="list-style-type: none"> <li>EBITDA lower than in 2021 for sharp increase in energy costs and inflation</li> </ul>
	43,3 13,9%	37,7 10,6%	EBITDA ADJUSTED % on net revenues	27,8 7,8%	
	15,9 5,1%	8,9 2,5%	EBIT REPORTED % on net revenues	2,2 0,6%	
	24,0 7,7%	16,6 4,6%	EBIT Adjusted % on net revenues	8,6 2,4%	<ul style="list-style-type: none"> <li>Decrease in Vega P80 depreciation</li> </ul>
	15,4 4,9%	8,6 2,4%	PROFIT BEFORE TAXES % on net revenues	1,4 0,4%	<ul style="list-style-type: none"> <li>Net income neutral tax effect</li> </ul>
	14,9 4,8%	9,1 2,5%	NET INCOME % on net revenues	1,3 0,4%	

(1) One-off positive contribution resulting from other revenues from settlement of Law 808/85 payables, extraordinary provisions for risks for Vega C return to flight activities and for the execution of future programs . Law 808/15 concerns the public financial support for the development of certain projects in the aerospace and defense sector

# Order backlog historical trend and guidance 2023

Data in € - M

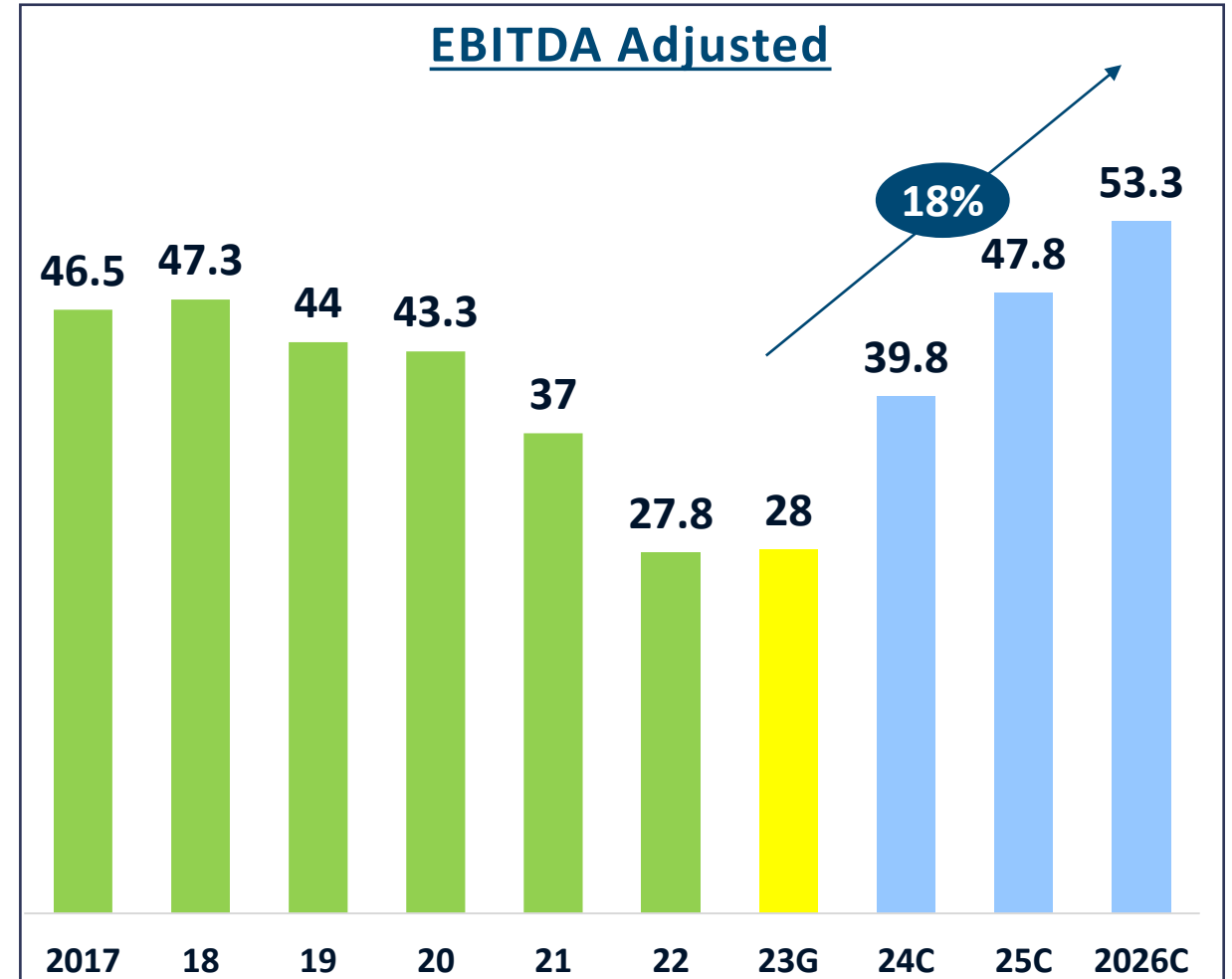
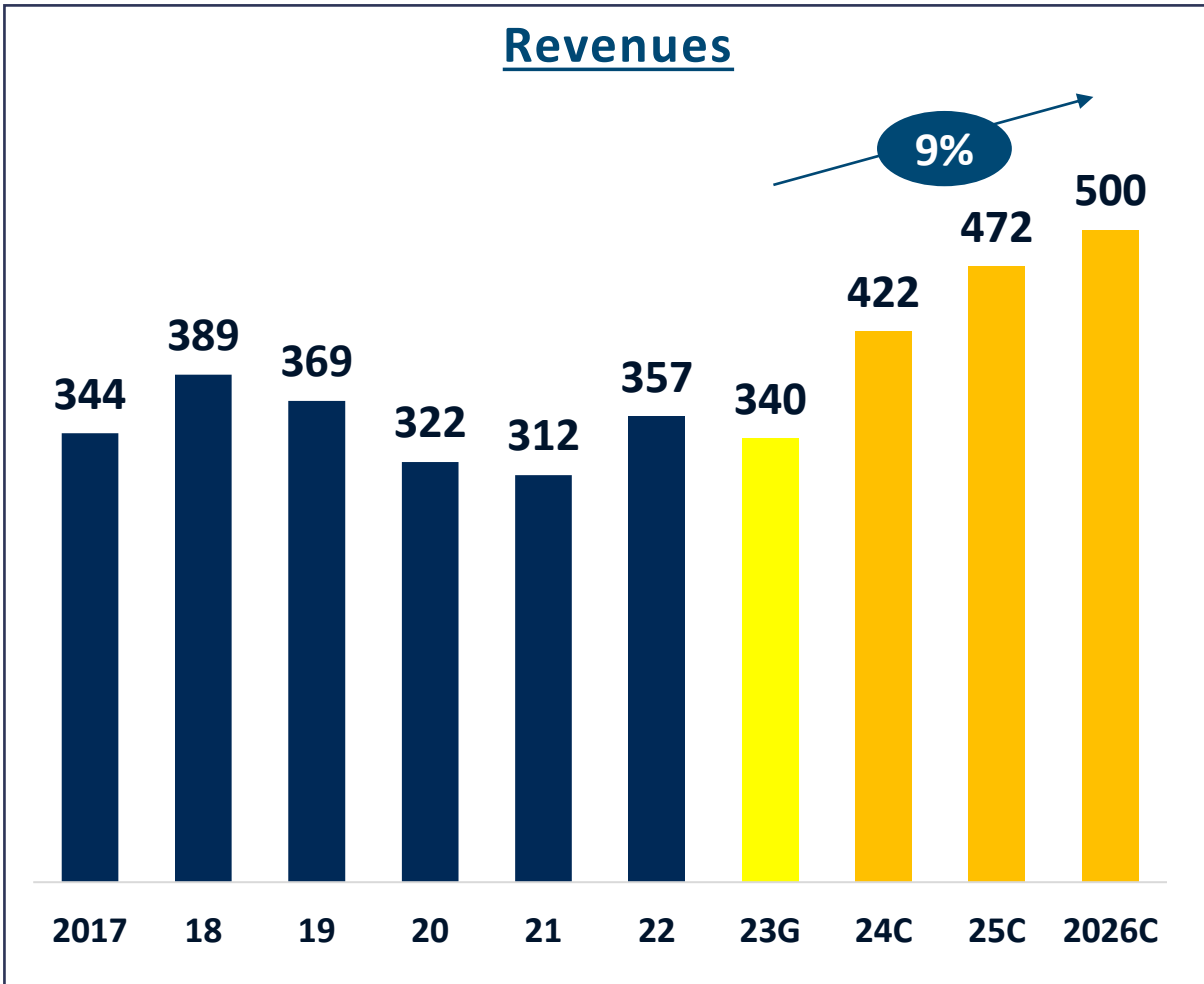
Order Backlog



# Revenues and Adjusted EBITDA historical trend, 2023 Guidance and consensus

Data in Euro Mln

xx% = 2022-26 Exp. CAGR

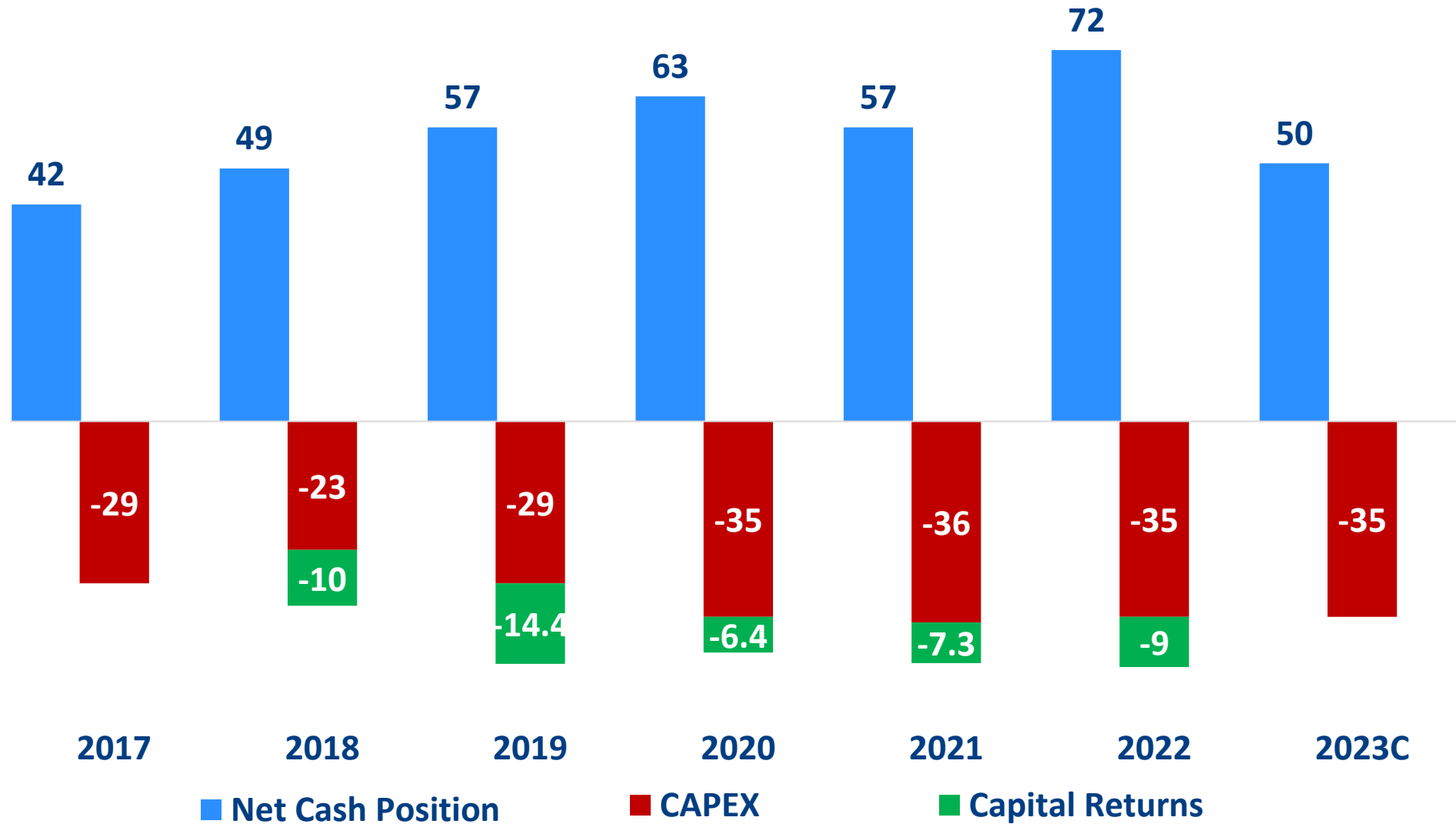


2023G: Guidance Midpoint;

202XC: Analysts' consensus estimates



# Sustained Cash generation for CAPEX and returns to shareholders



# Appendix

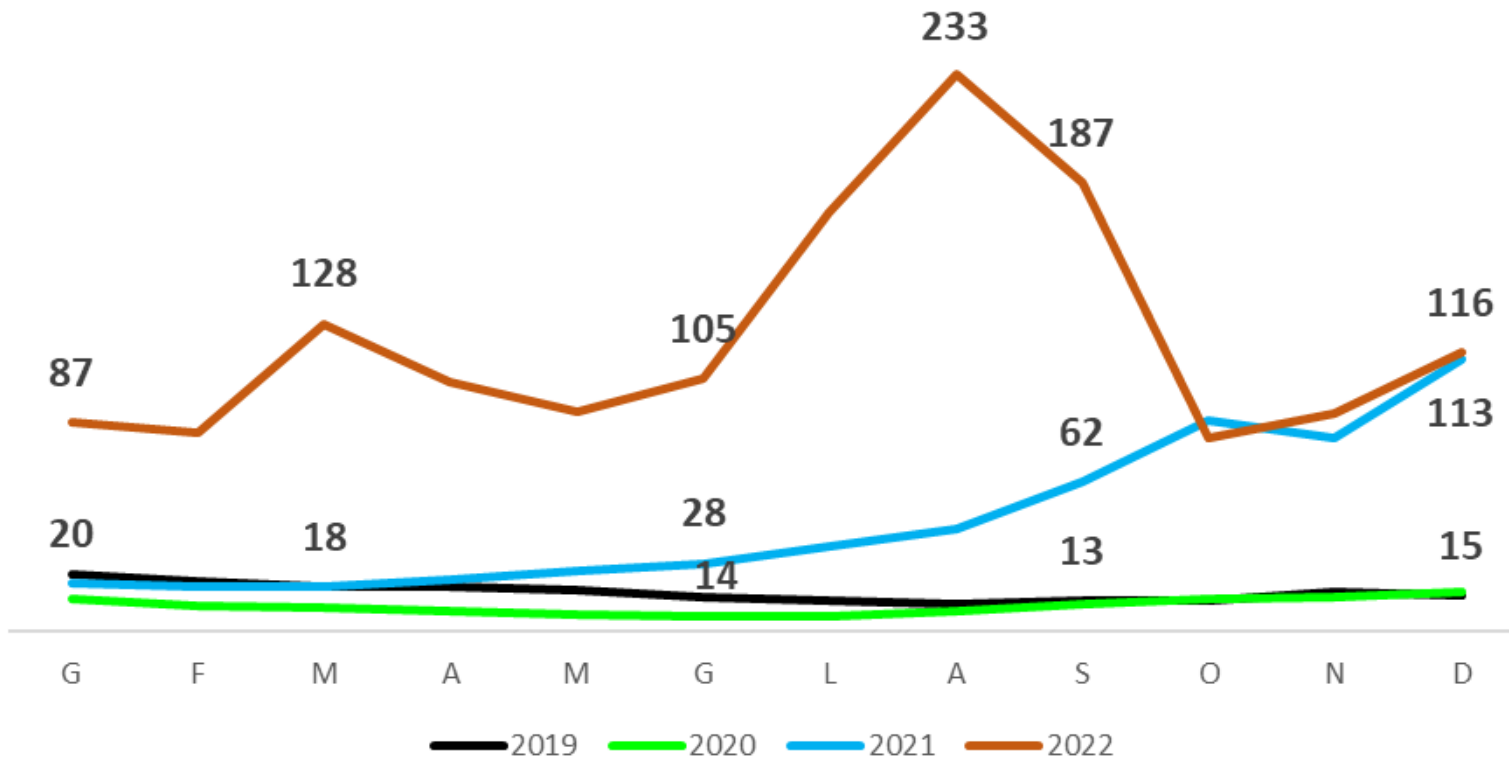
# Gas price increase since 2H 2021 with hit in 2022 impacted industrial production costs



## Ongoing actions

- Investment in a new thermoelectric steam generation equipment
- Assessment of investments in photovoltaic and solar plants

## Italian average monthly gas prices 2019-2022 (€/MWh)



Year	Yr avg Gas price €/MWh
2022	123
2021	46
2020	10
2019	16

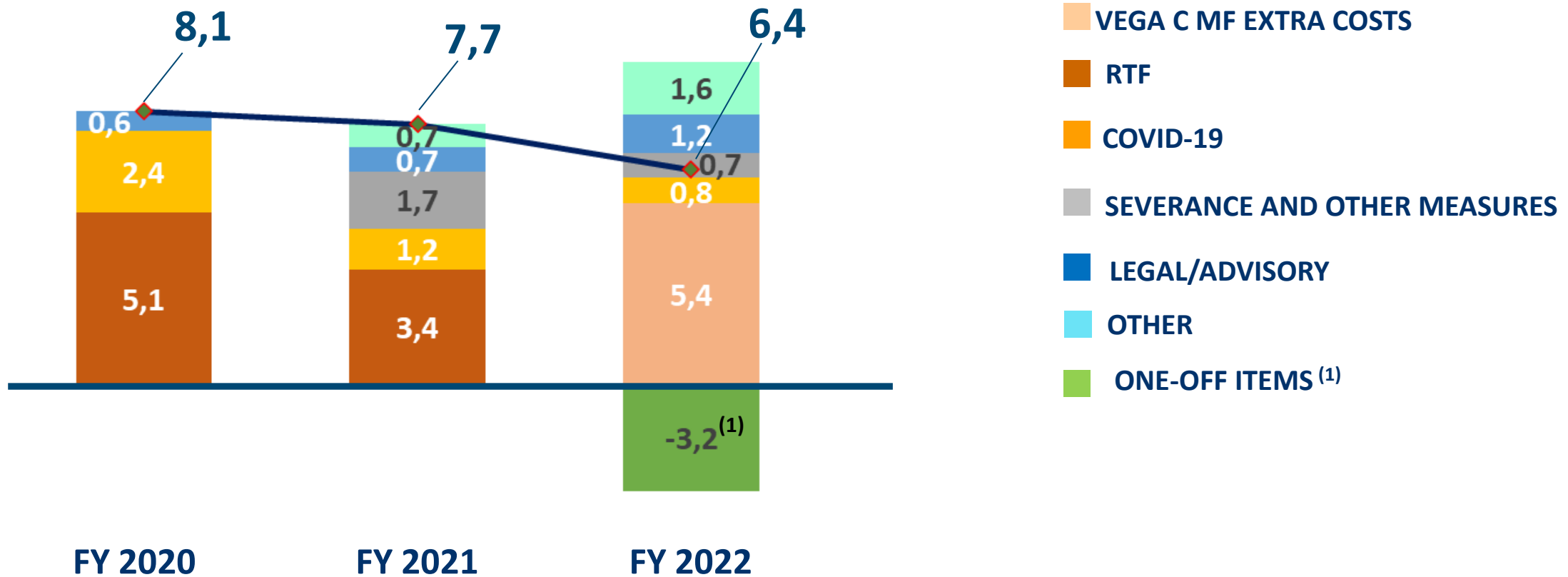
## Expected in near future

- Expected trend for 2023 Gas price with current forecast<sup>1</sup>: 55 €/Mwh

# Evolution of non-recurring costs

Data in €-M

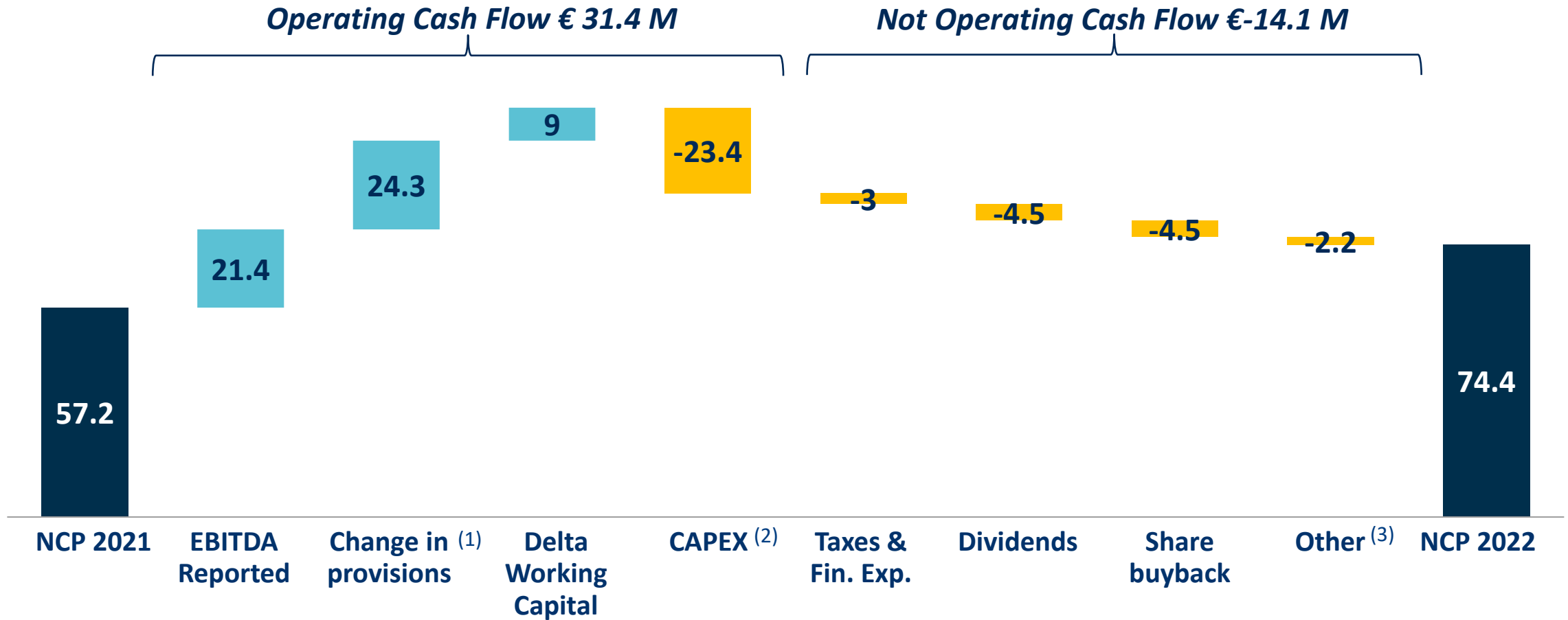
## Non recurring costs by nature



(1) Include one-off positive contribution resulting from other revenues from settlement of Law 808/85 payables, extraordinary provisions for risks for Vega C return to flight activities and for the execution of future programs . Law 808/15 concerns the public financial support for the development of certain projects in the aerospace and defense sector

# 2021-2022 Net Cash Position bridge

Data in €-M



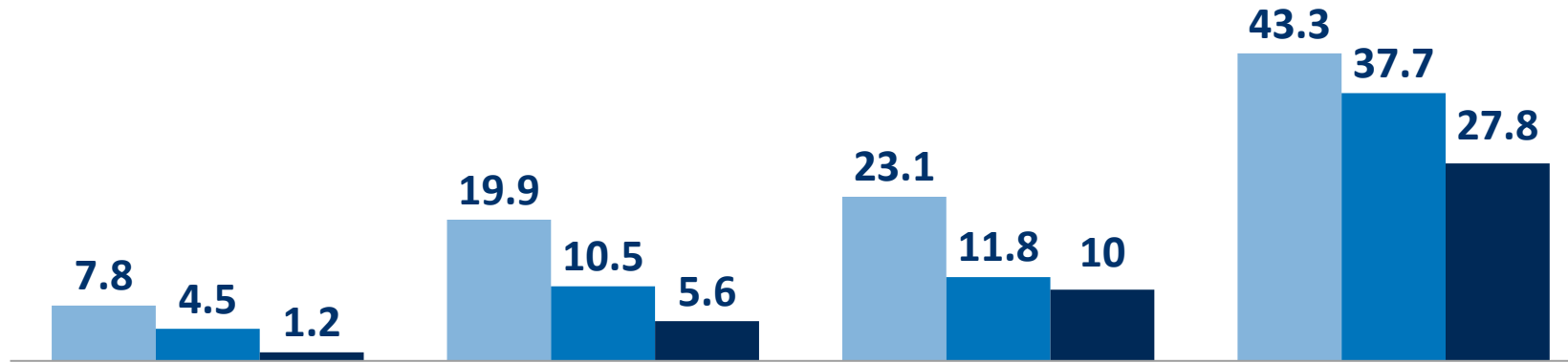
(1) Increase in provisions for extraordinary accruals for risks for Vega C Return to Flight activities (net of expected ESA compensations) and for the execution of future programs

(2) Net of P80 assets offset within settlement of Law 808/85 payables

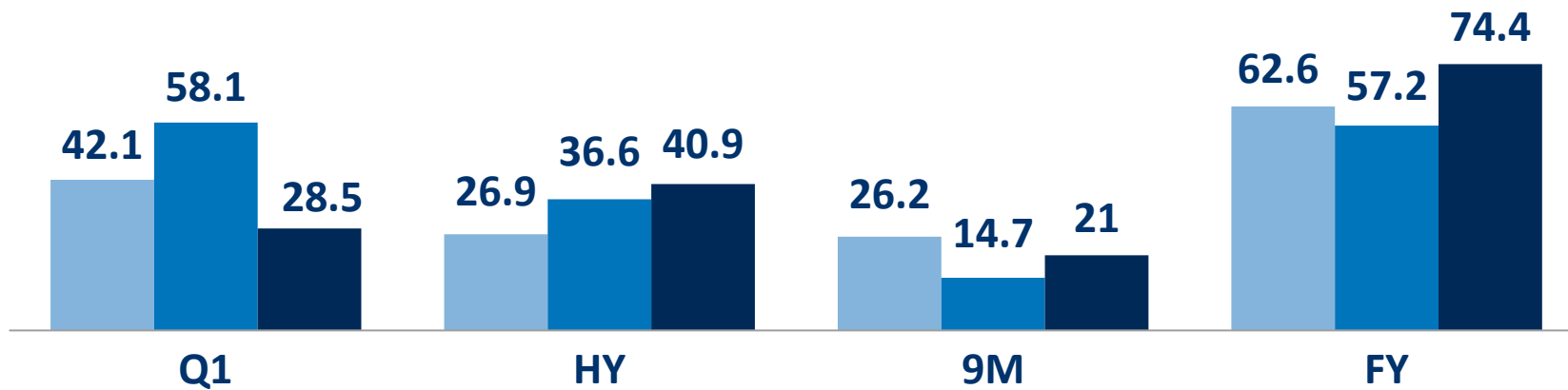
(3) Net effect from goodwill and other items

# EBITDA and Cash generation heavily concentrated on Q4s

EBITDA Adjusted (€ - M)



Net Cash Position (€ - M)



2020 2021 2022

# Temis & ART deal structure

**Financial investor**

**Avio**

- PCB Production
- Testing and verification



*Long-term agreement to secure procurement and testing*

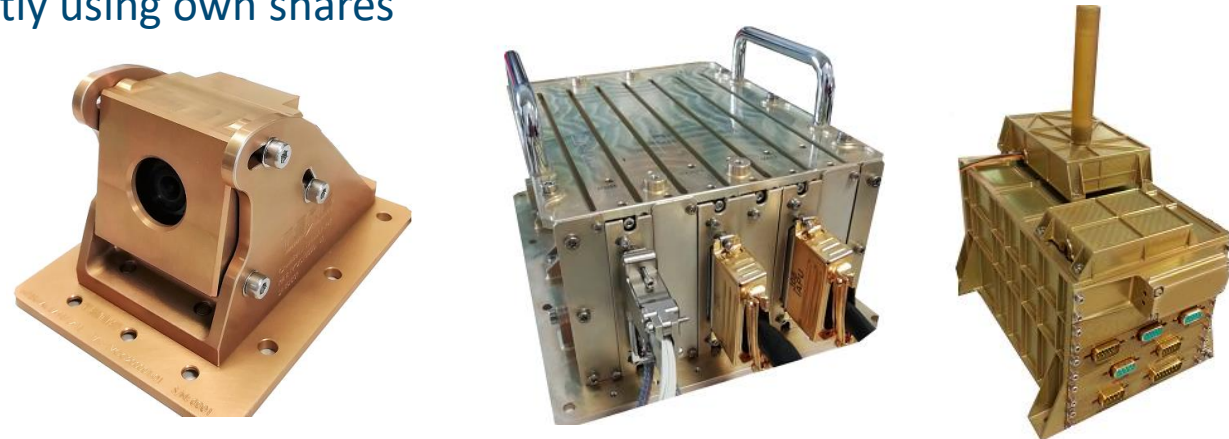


- Design of avionics subcomponents
- Integration
- Testing and verification



- Provider of avionics, on board telemetry and cameras for Vega and Vega C
- 20 employees
- Avio legacy supplier
- Subsidiary of ART Group (active in the sports cars on-board software)

Consideration paid partly in cash and partly using own shares

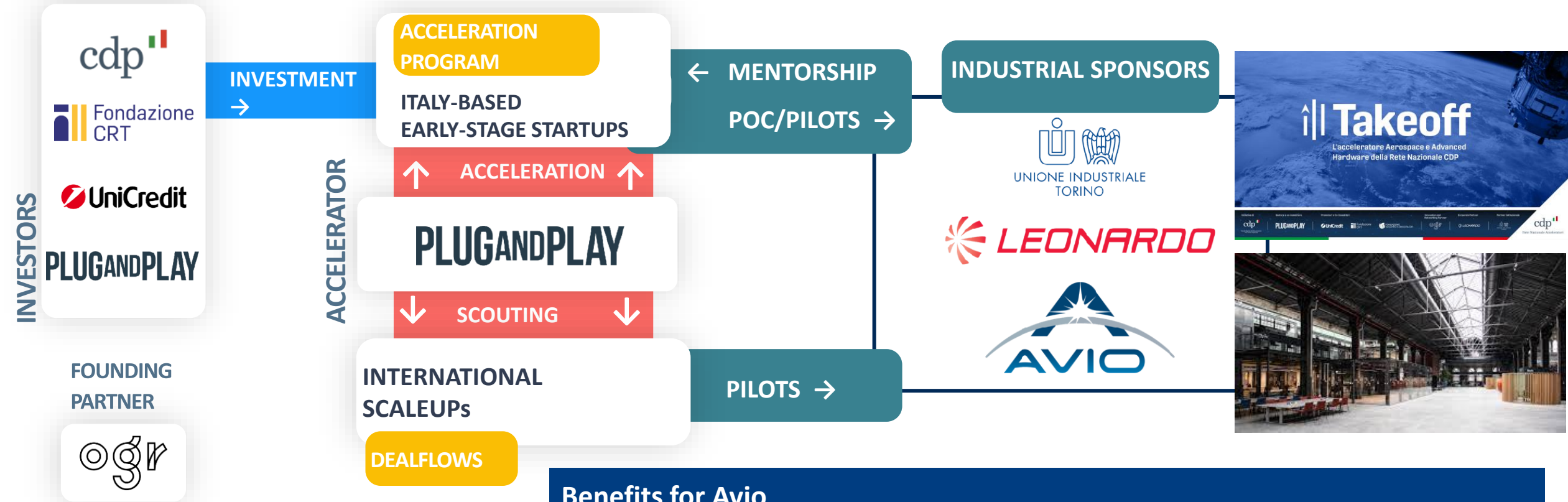


\* And one seat in the Board of Directors



# Enabling open-innovation through participation to CDP space startup accelerator

## Participation to Turin CDP aerospace start-up accelerator “Takeoff”



- Benefits for Avio**
- Explore the Italian start-up ecosystem with a structured approach
  - Additional access to worldwide selected start-ups according to Avio’s needs through customized dealflow service
  - Access new technologies and outsource development and research projects



# Kuiper constellation leveraging also European Ariane 6 for deploying, leading to upgrades and perfo improvement also for the Vega program



## Total constellation size



3,236 sats

## Deployment time limit



2026 for 1,618 sats

## Launch strategy



- 12 New Glenn (Blue Origin)
- 38 Vulcan (ULA)
- 18 Ariane 64



## Development and production effort



P120

+10% propellant and firing time



+10% performance for Vega C and Ariane 6



P160



New 4562 Building under construction

- 18 A64 launches booked, of which 16 with the more powerful version A64+ with new P160 engine
- Total expected order for Avio of 72 boosters
- P160 development already started thanks to initial ESA funding and production starting in 2024

## CONTACTS

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