Investors' update after VV17

27 November 2020

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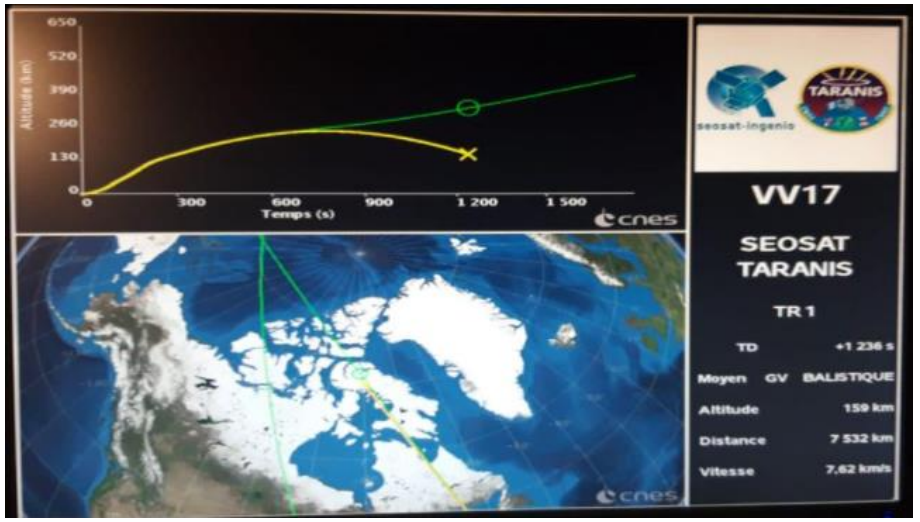
Update on VV17 flight anomaly – Established facts and ongoing investigation

Established facts

- 1st stage (P80) nominal propulsion and separation
- 2nd stage (Z23) nominal propulsion and separation
- 3rd stage (Z9) nominal propulsion and separation
- 4th stage (AVUM) nominal ignition and propulsion
- At ~8:00 min. (242km altitude) degradation of trajectory observed, thrust vector control stroke anomaly
- At ~17:48 min. loss of telemetry
- At ~28:00 min. estimated splashdown

Root Cause Early Investigation

- Initial analyses point out to an integration mistake in the electrical actuation system of the 4th stage (AVUM)
- Independent Inquiry Commission setup* to:
  - Verify root cause of anomaly
  - Define corrective actions for return-to-flight
  - Maintain confidentiality until completion of investigation (targeted by 15th December)



(*) Established on 18 November 2020, chaired by ESA and Arianespace with participation of CNES and Avio

SOURCE: Arianespace, ESA

The way forward

- Support the Independent Inquiry Commission – conclusion targeted by 15th December
- Timely return-to-flight key priority for all involved stakeholders: Customers, Avio, Arianespace, ESA, CNES
- 2021 Vega manifest to be updated once corrective actions will be finalized by the Independent Inquiry Commission
- Continue in parallel the various development streams:
  - Vega C: Qualification Review kick-off imminent - preparing for Maiden Flight
  - Space Rider: First tranche of contract approved this week
  - Vega E: First tranche of contract approved this week
  - Space Exploration Propulsion Systems: new opportunities captured
  - Space Propulsion Test Facility in Sardinia: construction well in progress
- Execute on production activities:
  - P120 production ramp-up: 2021-22 volumes under definition
  - Increase ASTER-30 production
- FY 2020 Guidance confirmed

Strong support of Institutions for Vega return-to-flight

“Spazio: pieno supporto COMINT a lanciatore Vega

[…] Il Comitato Interministeriale per le politiche dello Spazio e l’Aerospazio, unitamente all’Agenzia Spaziale Italiana, garantiscono il pieno supporto ad Avio per assicurare la continuità alle attività di accesso allo Spazio che rappresentano una capacità strategica per il Paese“

Comitato Interministeriale per le politiche relative allo spazio e all'aerospazio, 17th November 2020

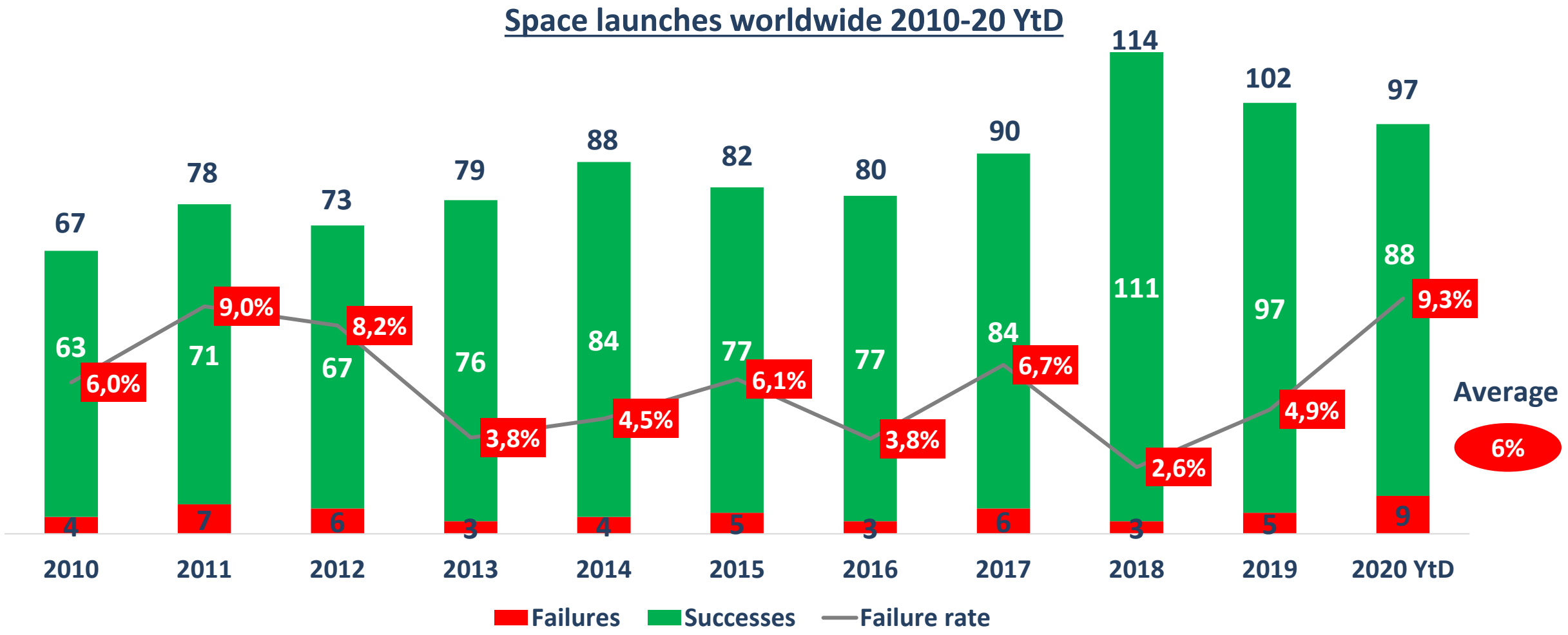
Settore dello spazio, dichiarazione congiunta Italia-Francia

25 Novembre 2020

Italia e Francia hanno inoltre rinnovato il pieno supporto ai programmi Ariane 6 e Vega per l’accesso autonomo allo spazio, sottolineando per quest’ultimo l’impegno comune per il ritorno al volo nei tempi più rapidi.

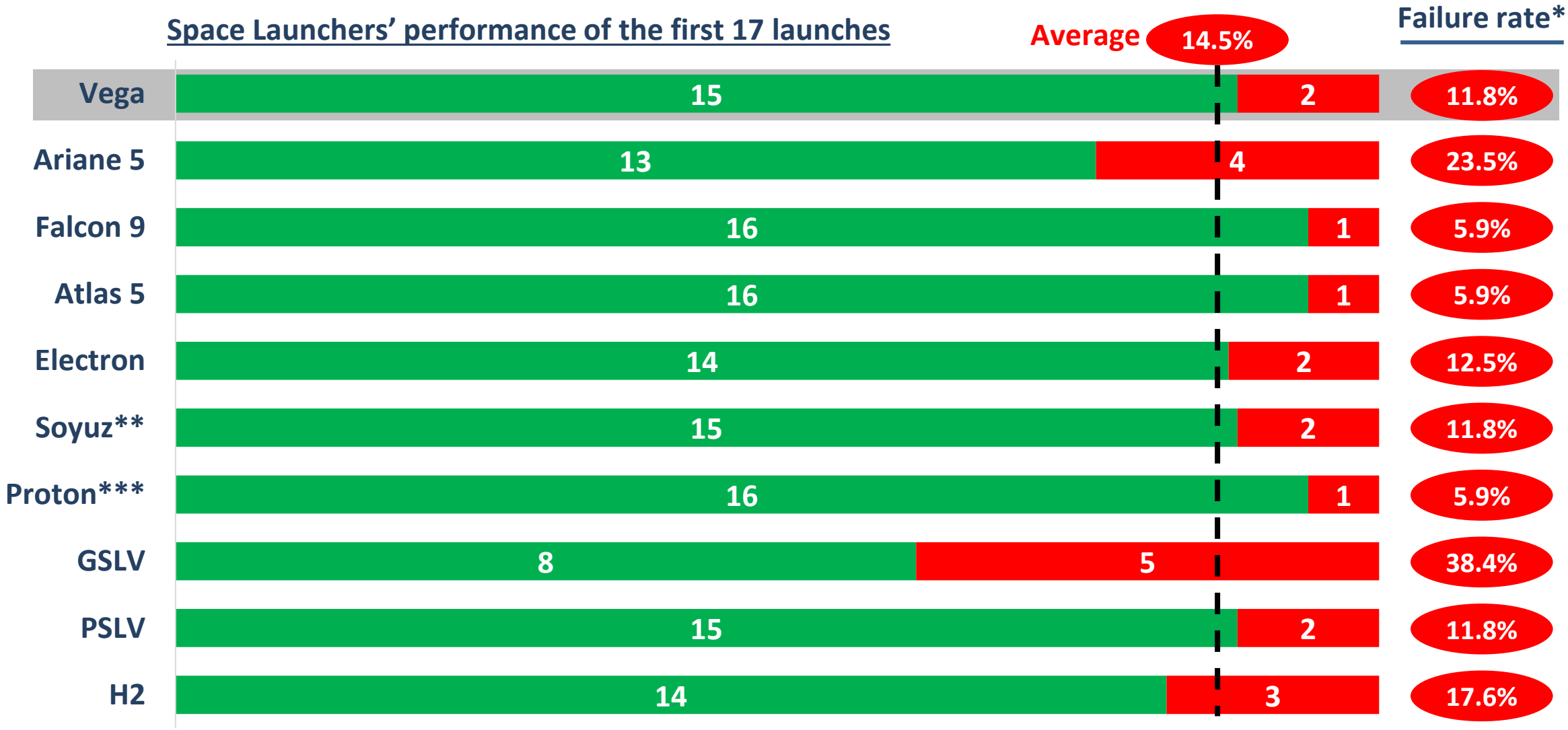
SOURCE: Italian Government, Twitter

Space launchers worldwide show an average 6% failure rate



SOURCE: Elaboration on SpaceLaunchReport data

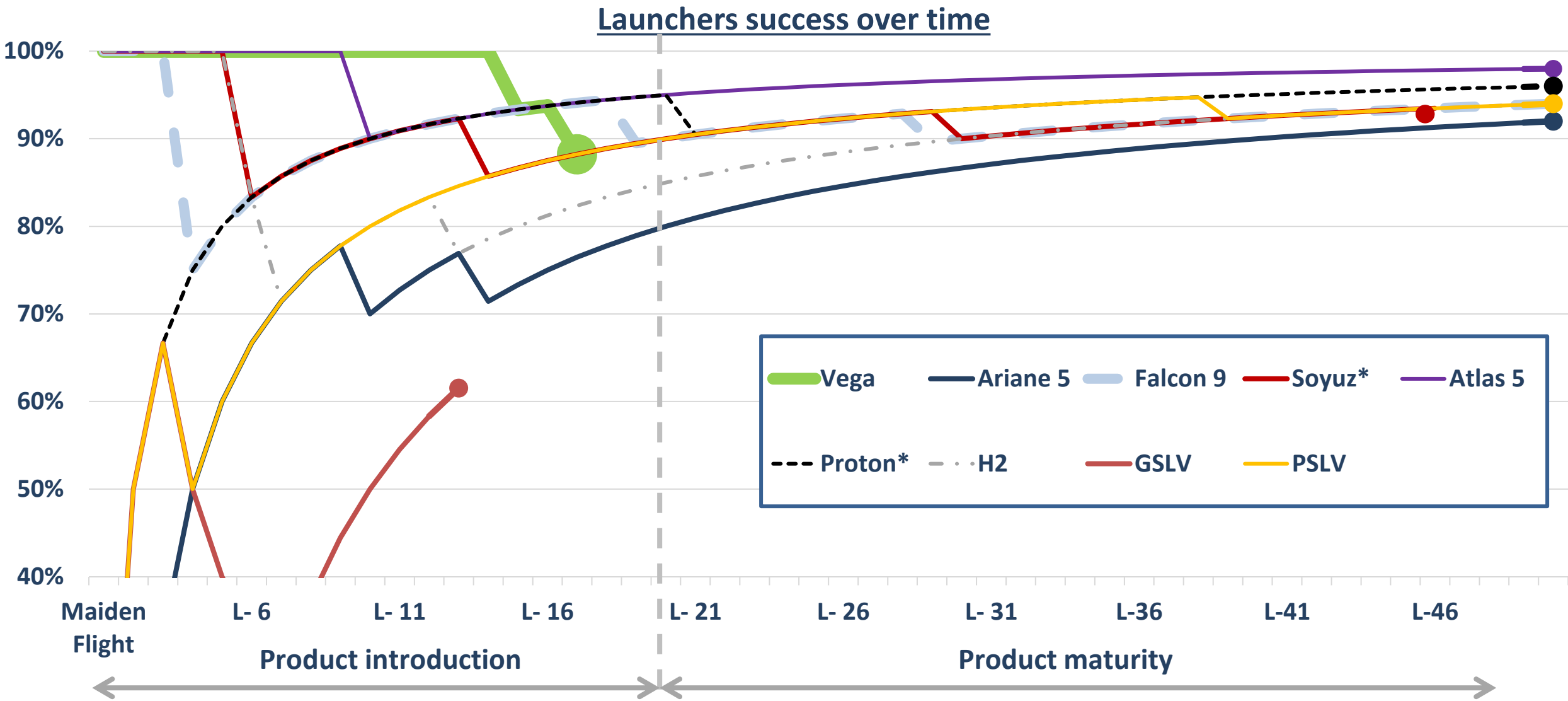
After 17 launches, Vega is in line with the average performance



*Includes also partial failures **Soyuz 2-1b/Fregat *** Proton-M/Briz M

SOURCE: Elaboration on SpaceLaunchReport; Press Search

Space launchers show dispersion in performance over the first 20 launches before reaching full product maturity



*Soyuz 2-1b/Fregat ** Proton-M/Briz M

SOURCE: Elaboration on SpaceLaunchReport

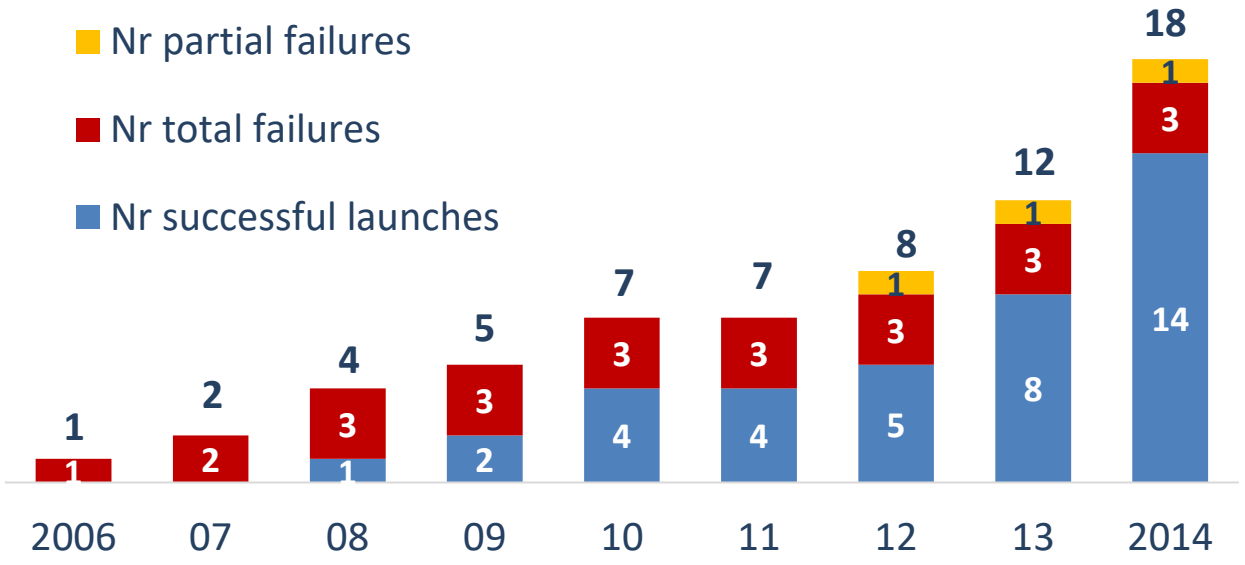
Comparison of recently developed launchers allows for some considerations

SPACEX

F9

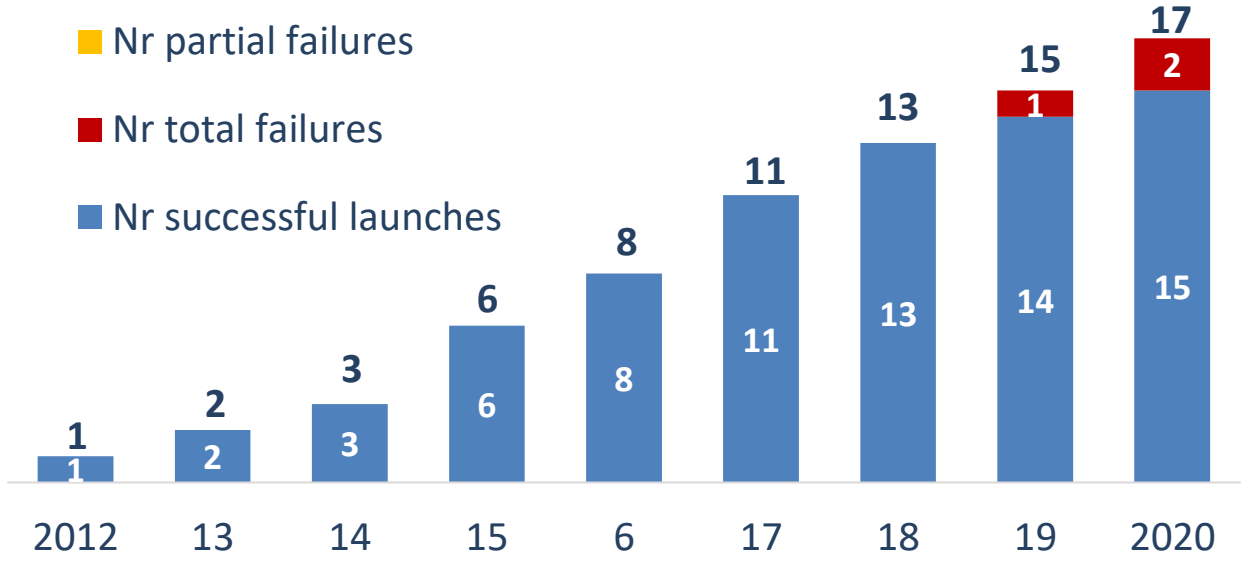
AVIO

vega



2006
Falcon 1 MF

2010
Falcon 9 MF

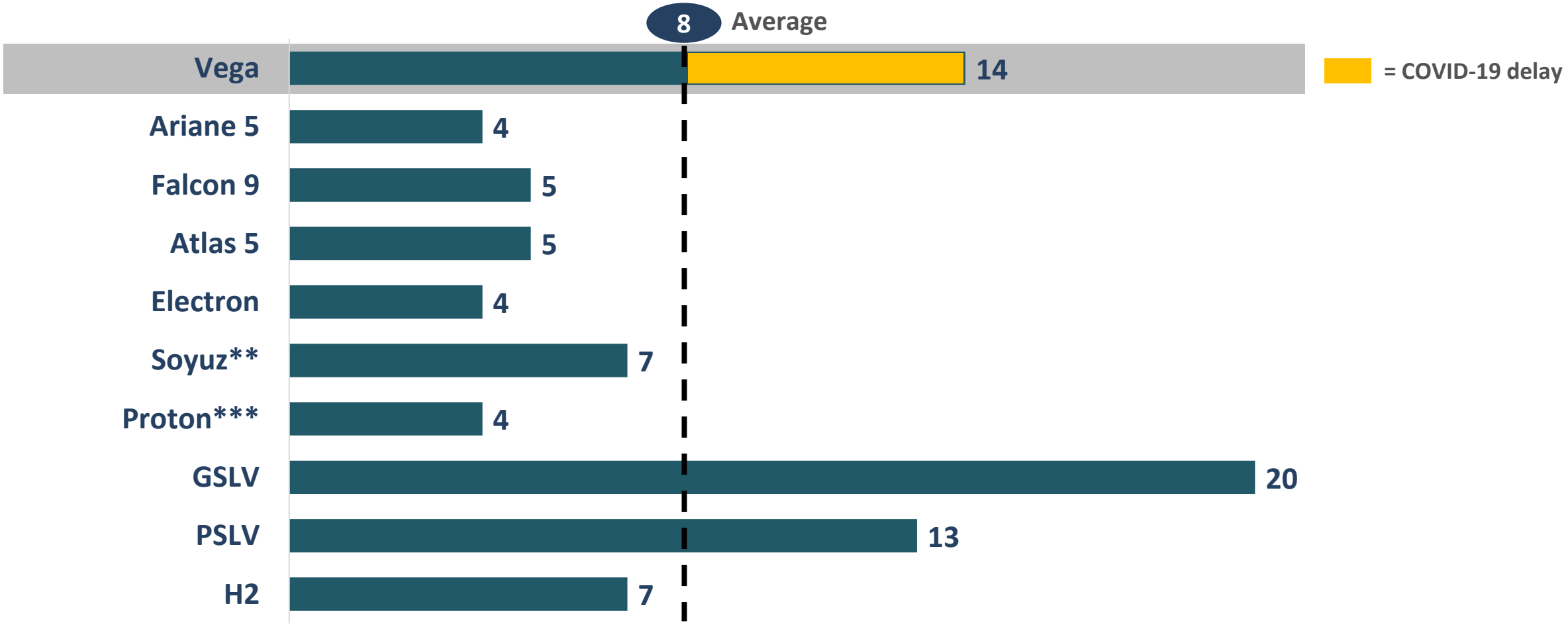


2012
Vega MF

2012-19
14 Vega flights – no failures

Return-to-Flight timing varies depending on specific actions to be undertaken

Average* Return-to-Flight time in months

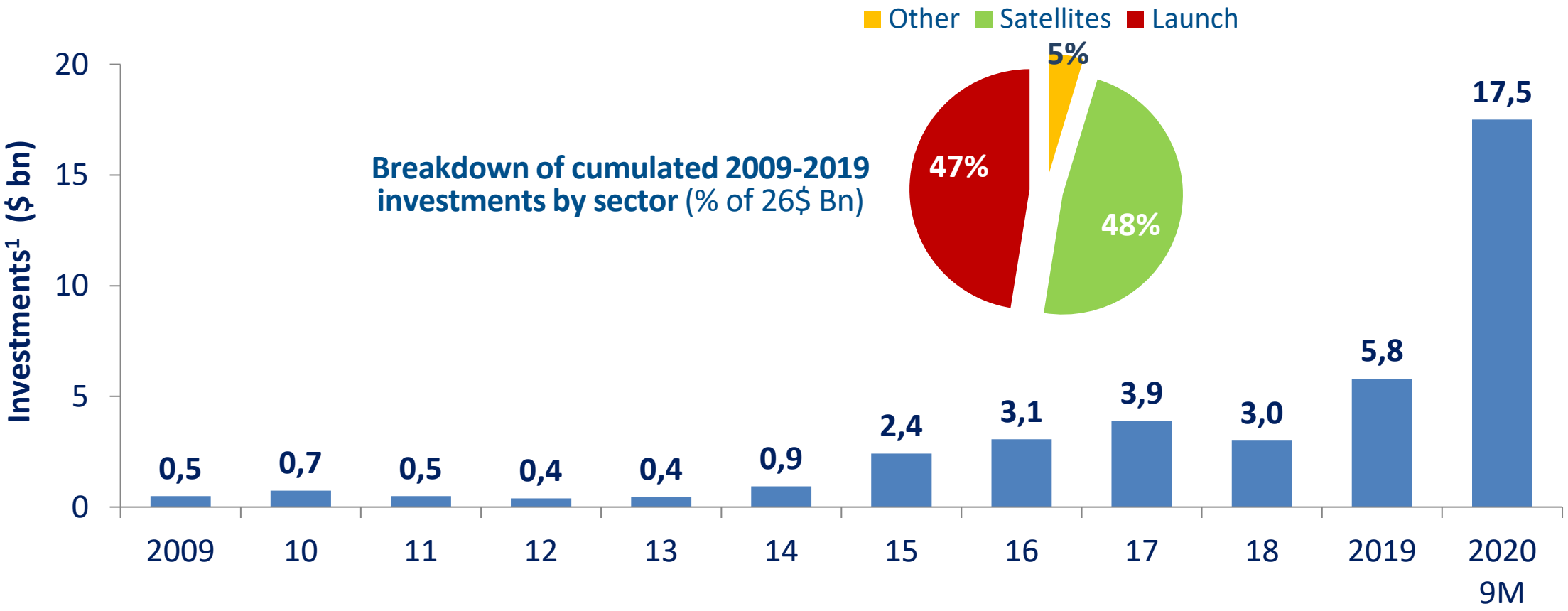


*Average elapsed time for the R-t-F after the last two failures. Includes also partial failures **Soyuz 2-1b/Fregat *** Proton-M/Briz M

SOURCE: Elaboration on SpaceLaunchReport; Press Search

Despite the many challenges in Space Launch, private investments in the sector continues to increase rapidly

Private sector investments in Space Ventures



(1) Annual non-governmental equity investment

Source: Elaboration on Space Angels Quartelry Investment Reports

The rise of satellite constellations confirms space launch capabilities to be an indespensable and strategic capability

STARLINK

- 955 satellites already launched in LEO
- In October 2020 antennas for Beta testing of Starlink delivered to end-users
- Agreements in place with US Army and Microsoft Azure for connection services

amazon | project kuiper

- Granted the FCC authorization to launch >3,000 satellites in LEO by 2030
- $ 10 Bn of total investments
- Target to provide direct internet access to Amazon customers

planet

- Different size and resolution Earth Observation (both optical and Radar) satellites constellations already active in LEO
- Launched in total >150 satellites since first launch in 2008

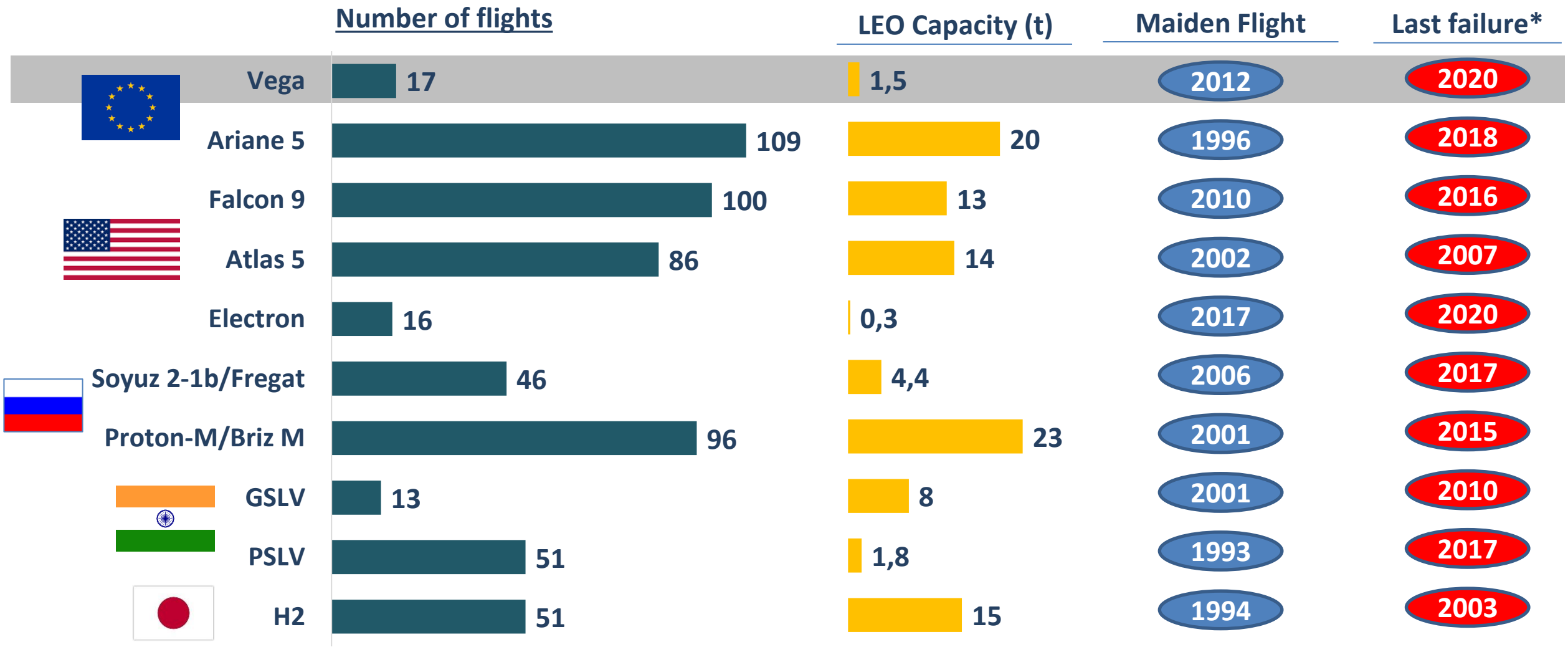
TELESAT

- New LEO constellation to deliver internet connectivity
- First demonstration satellite launched in 2018
- Planned a total of > 100 sats and potentially up to 300

SOURCE: Institutional websites, Press search

Appendix

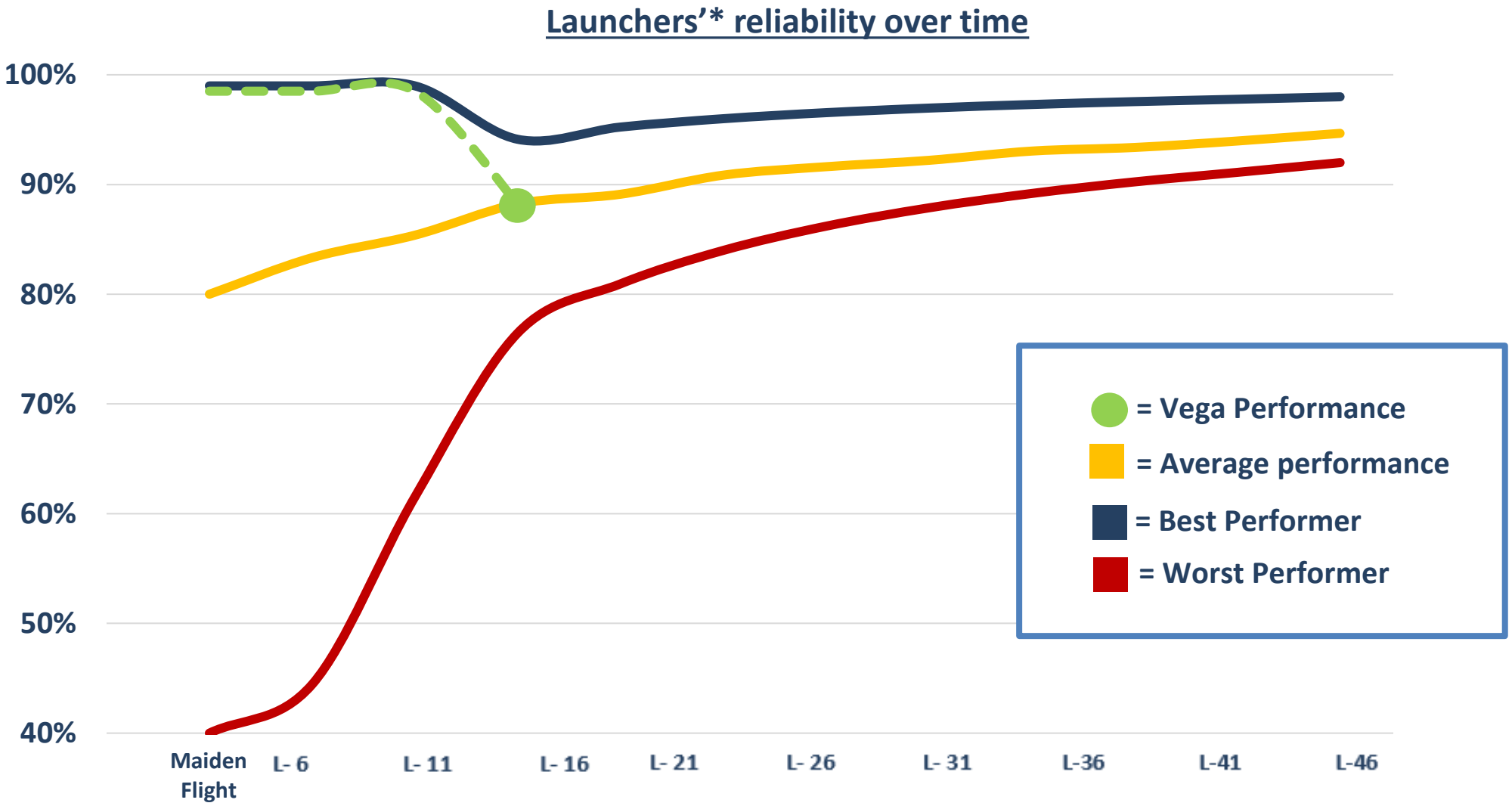
Launchers' reliability study peer group composition



*Includes also partial failures

SOURCE: Elaboration on SpaceLaunchReport; Press Search

Vega is currently showing performance in line with the market average



*Benchmark includes Vega, Ariane 5, Falcon 9, Atlas 5, Proton-M/Briz M, Soyuz 2.1/Fregat, Electron, H2, PSLV, GSLV

SOURCE: Elaboration on SpaceLaunchReport; Press Search

Contacts
+39 0697285158
investor.relations@avio.com