



Space Insurance and Collision Risk

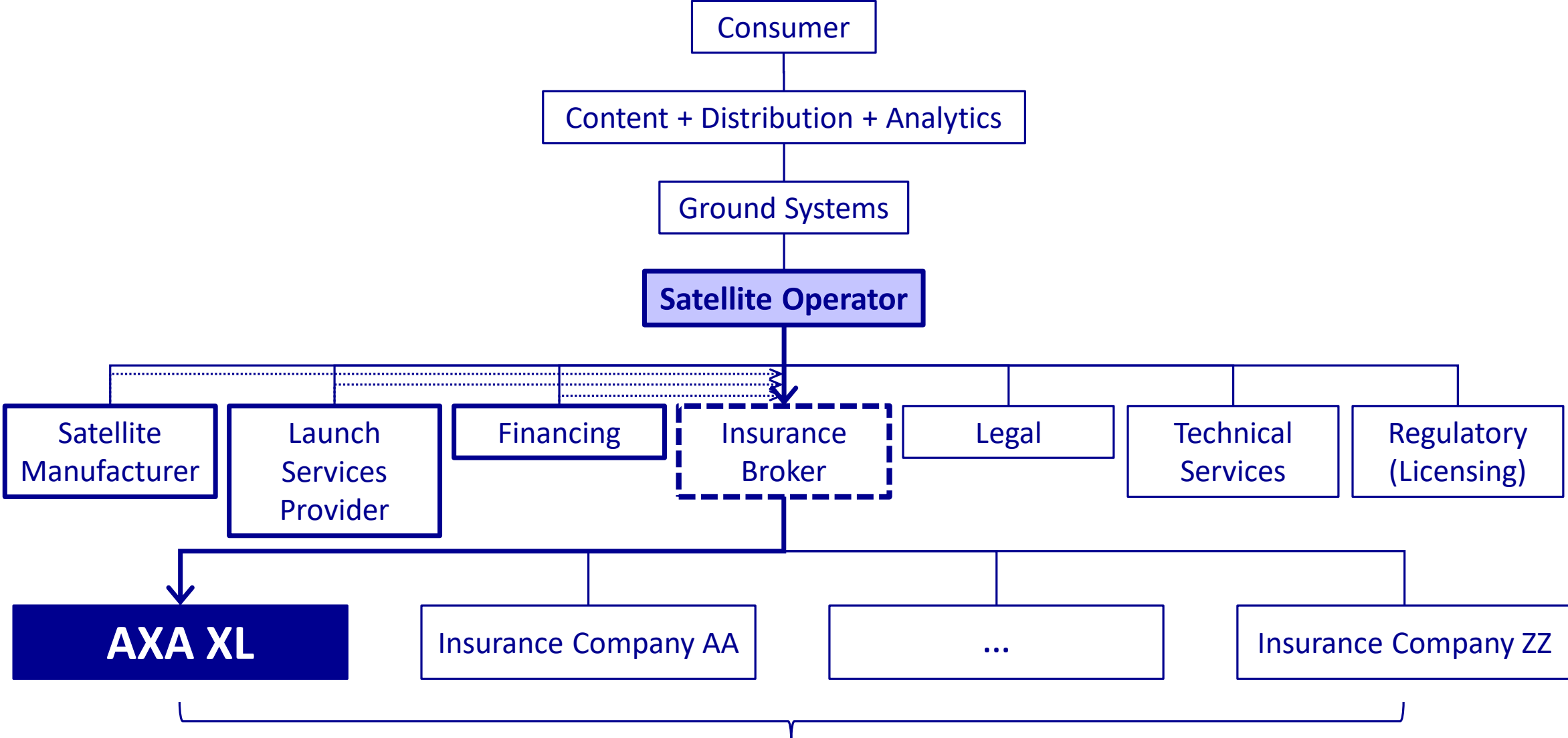
Christopher T.W. Kunstadter
Global Head of Space, AXA XL
chris.kunstadter@axaxl.com

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Introduction

- Space insurance is a critical enabler of innovation and investment
- Space insurance covers virtually all physical risk, with few exclusions, from launch onwards
- AXA XL works closely with industry to foster responsible space activity, across all market segments and around the world
- We can not afford to just watch and wait – we must act

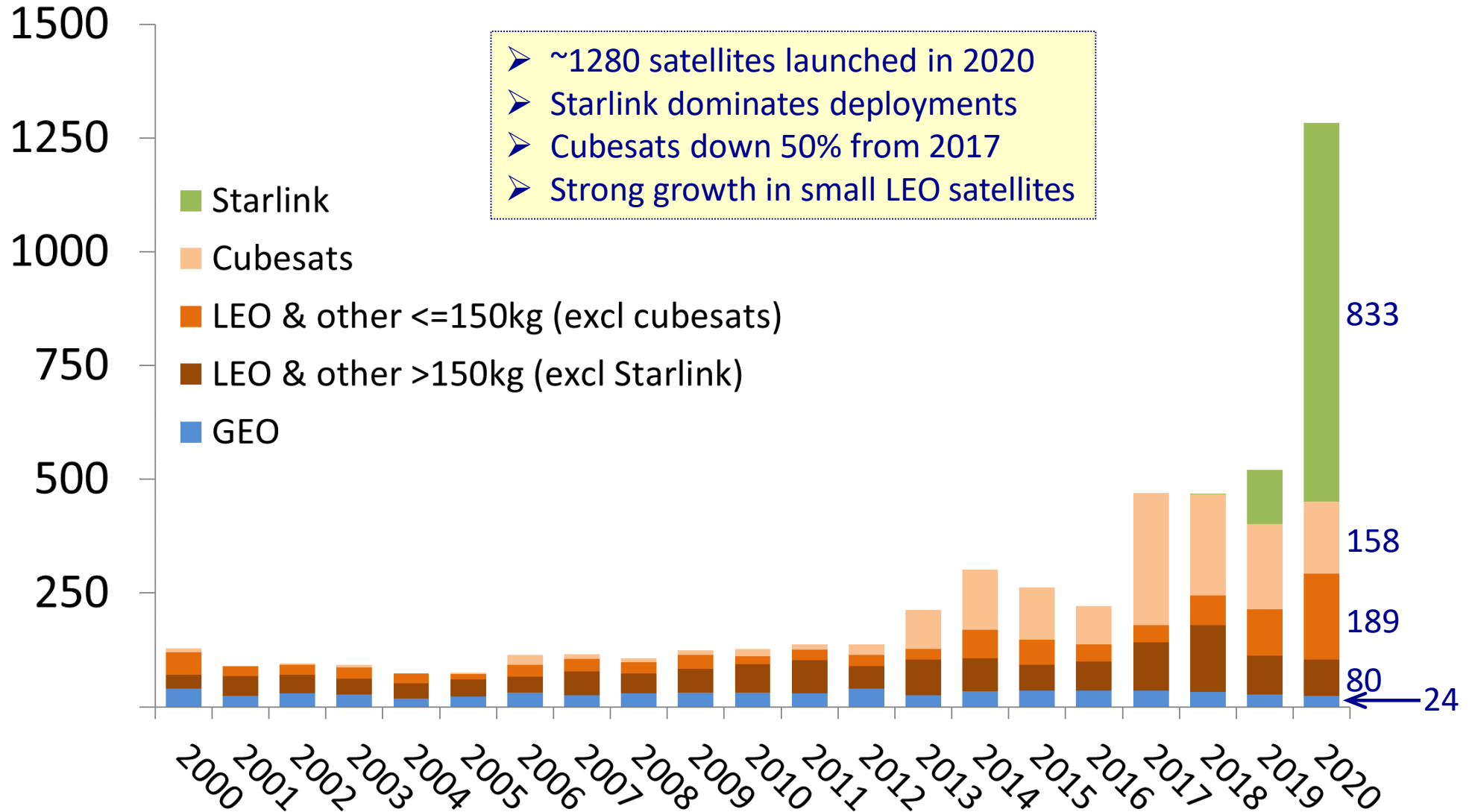
Satellite Value Chain



~30-35 direct space insurance companies worldwide

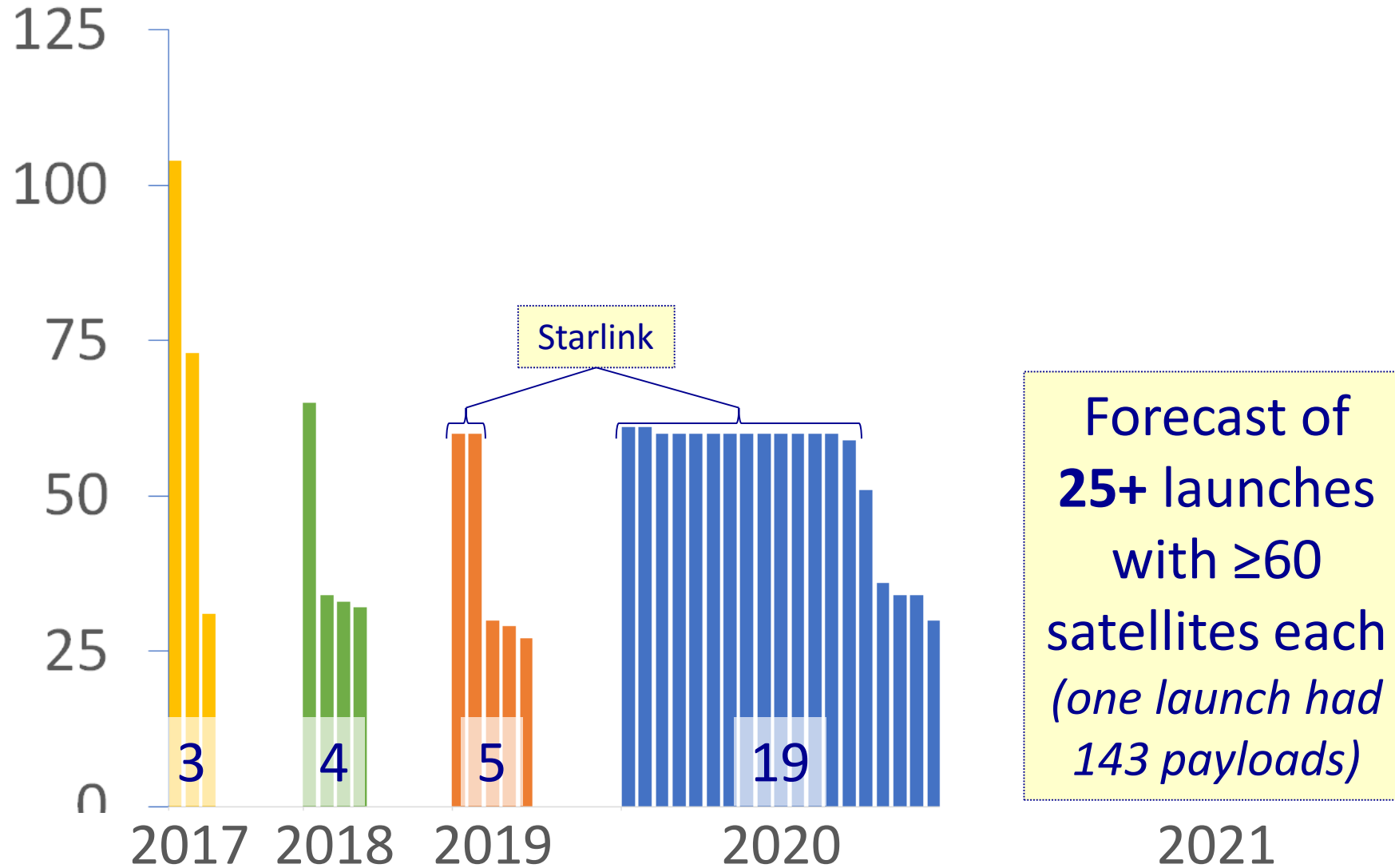
Satellites Launched

By orbit and size



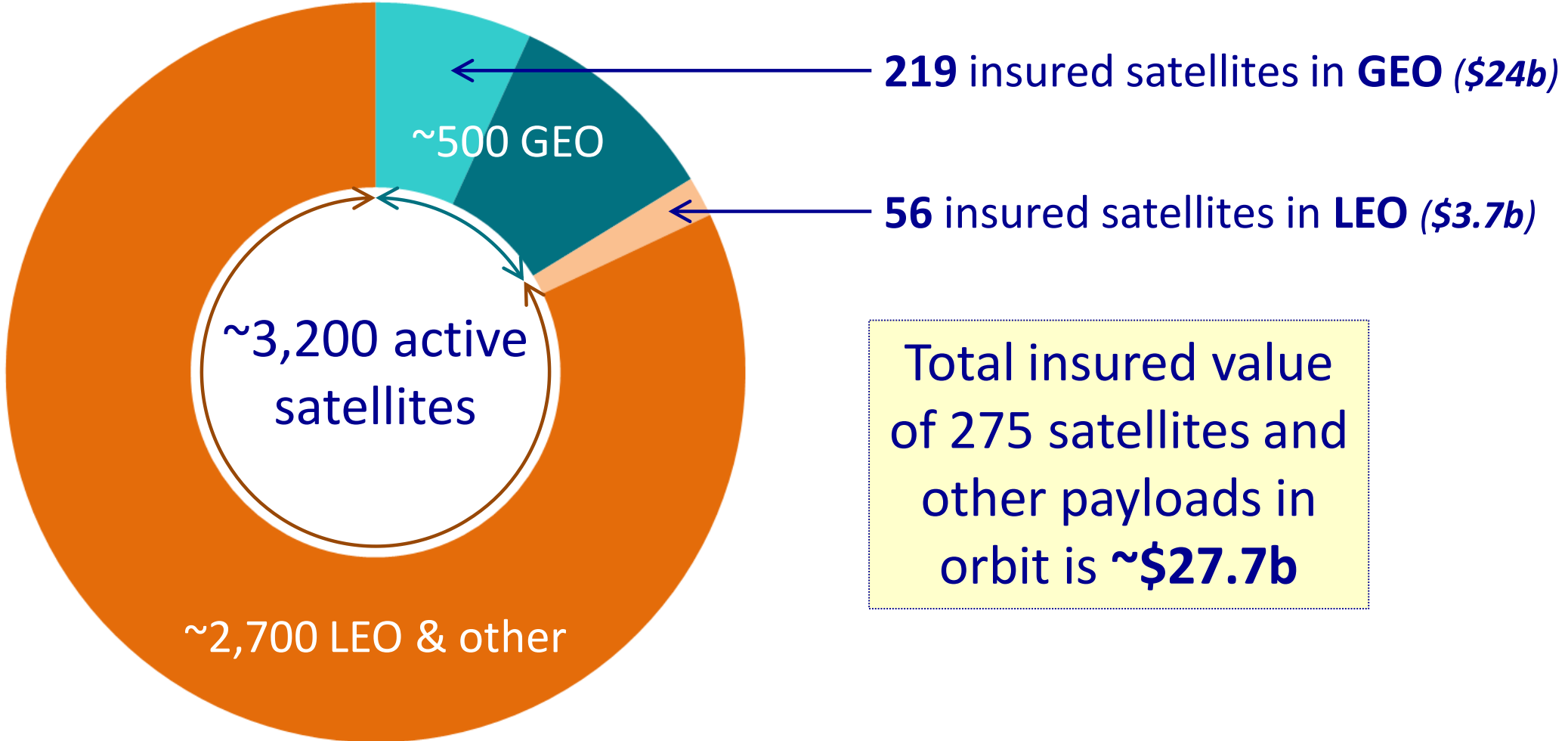
Multi-Satellite Launches, 2017-2020

Launches with more than 25 payloads

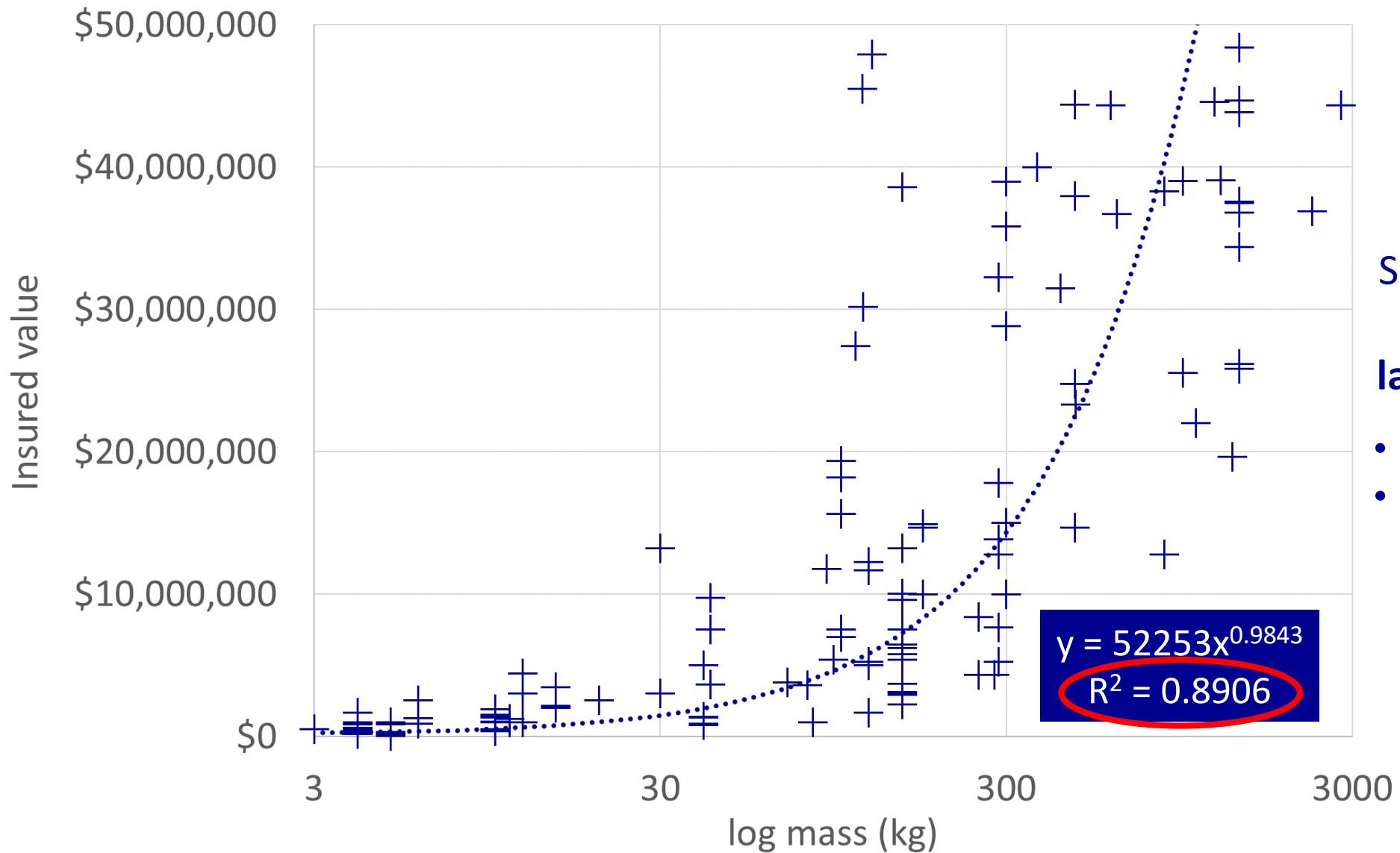


Active Satellites In Orbit

Insured vs uninsured



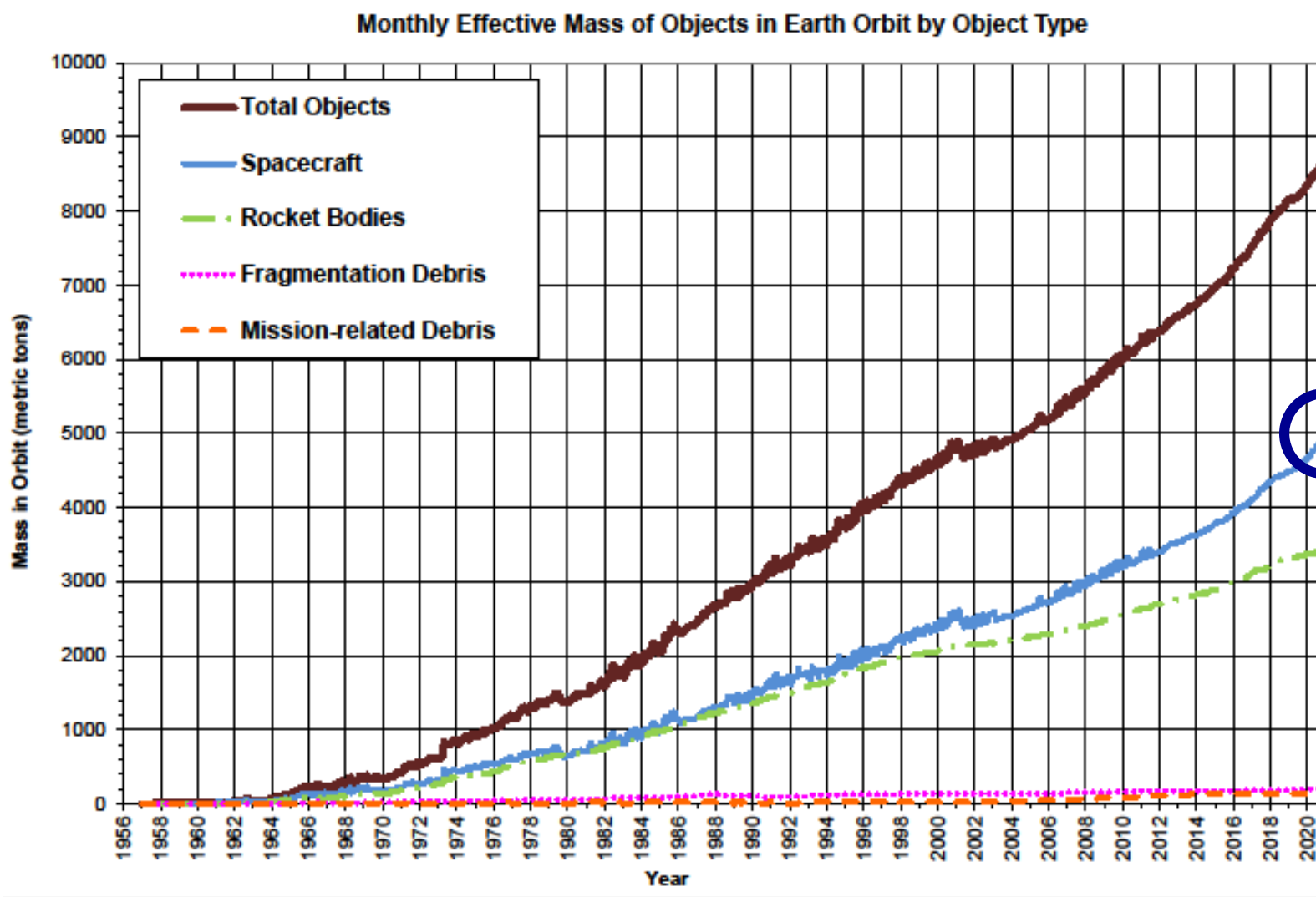
What is the value of satellites in LEO?



Sample: **850 insured LEO satellites launched since 2010**

- Mass 1 kg to 6500 kg
- Value \$40k to \$500m

What is the value of satellites in orbit?

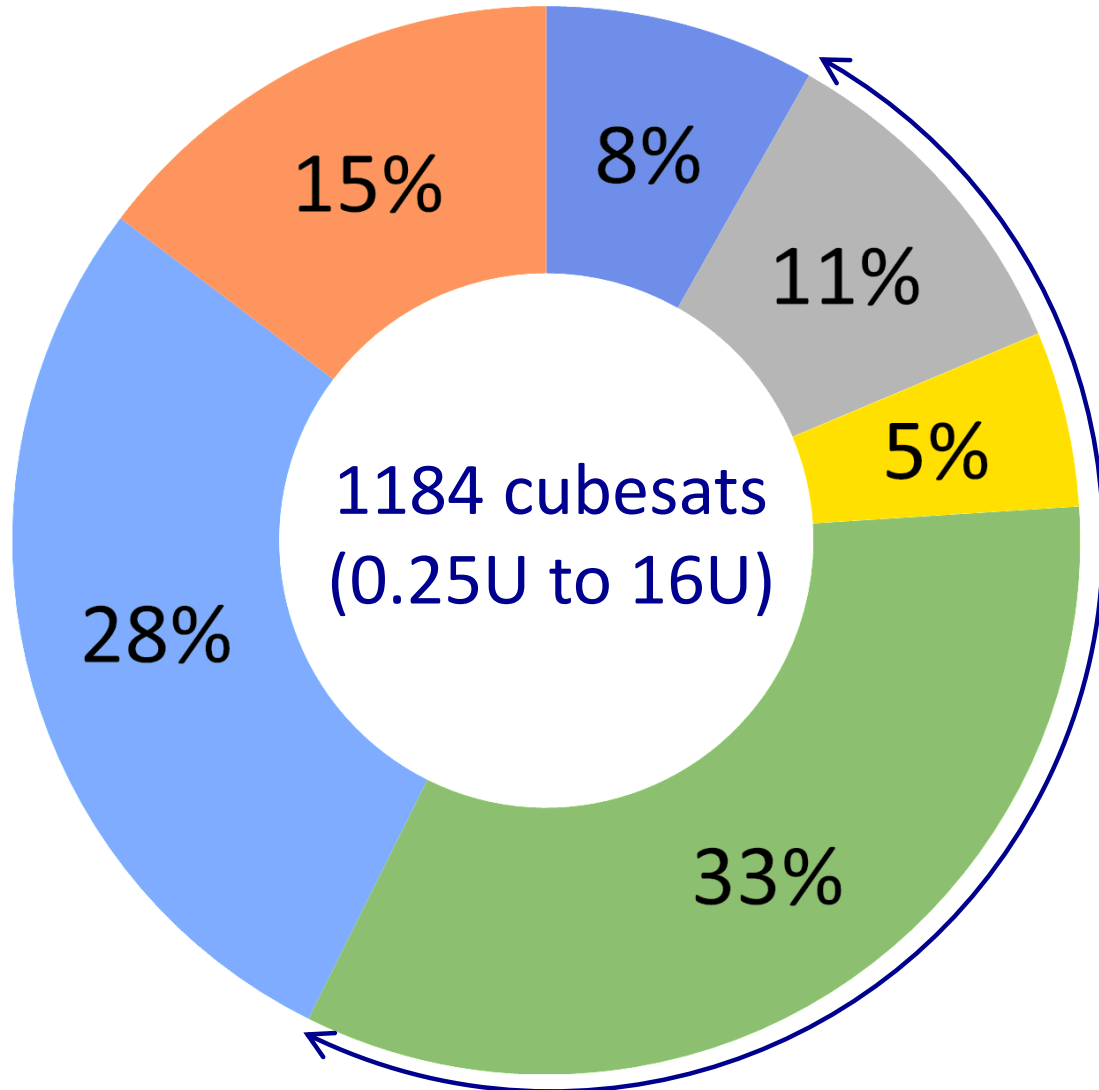


≈ 2,500-3,000 mT active
≈ \$100-200 billion asset value?
+ revenue & other benefits!

Monthly Mass of Objects in Earth Orbit by Object Type as of 5 January 2021. This chart displays the mass of all objects in Earth orbit officially cataloged by the U.S. Space Surveillance Network.

Mission Phases of Cubesat Losses

Cubesats launched since 2003



■ Launch Failure

■ DOA

■ Commissioning Failure

■ Partial Mission Achieved

■ Full Mission Achieved

■ Unknown

>30% mission failure rate?

• Assumptions:

➤ "Partial mission achieved" = 50% success

➤ "Unknown" = fully successful

➤ Average lifetime = 1 year

• $11\% + 5\% + (33\% \times 50\%) = 32.5\%$

• By comparison, GEO satellites $\approx 1.8\%$ annual failure rate

We need to use tracking systems!

Space Safety and Sustainability

1. Space insurers are **concerned**

- Failures ↑, premium ↓ = market volatility
- New launch vehicles = higher risk of failure
- More small satellites = higher risk of failure
- Debris risk? No...**Collision Risk!**

2. Insurers in general are **concerned**

- Pandemics
- Extreme weather
- Global political instability
- Low interest rates

3. “The **same rules** that apply in your **house** apply in **space**:

- *Don't make a mess*
- *Tell people where you are*
- *Clean up after yourself*

4. Best practices for space safety and sustainability

- **Tracking devices** for SSA on all satellites and rocket bodies that remain in orbit
- **Propulsion** for collision avoidance and post-mission disposal
- **Passivation** and **post-mission disposal** within 1 to 5 years of end-of-mission
- On-orbit servicing, inspection, repair, and **active debris removal**

- Policy and regulation must adapt to the changing market
- ***Responsible behavior is the baseline, not the aspiration***

We Talk the Talk, and We Walk the Walk

→ “Space insurance enables innovation and investment”

We are the financial foundation for space activity!

→ “We can not afford to watch and wait – we must act”

**Beacons and other tracking devices are inexpensive and reliable!
Use them!**

→ “At AXA XL we are focused on safety and responsibility in space”

We support responsible space activity, but the fate of the space ecosystem relies on recognizing the issues and cooperating on solutions!



Thank you!