

# RAAKS 2019

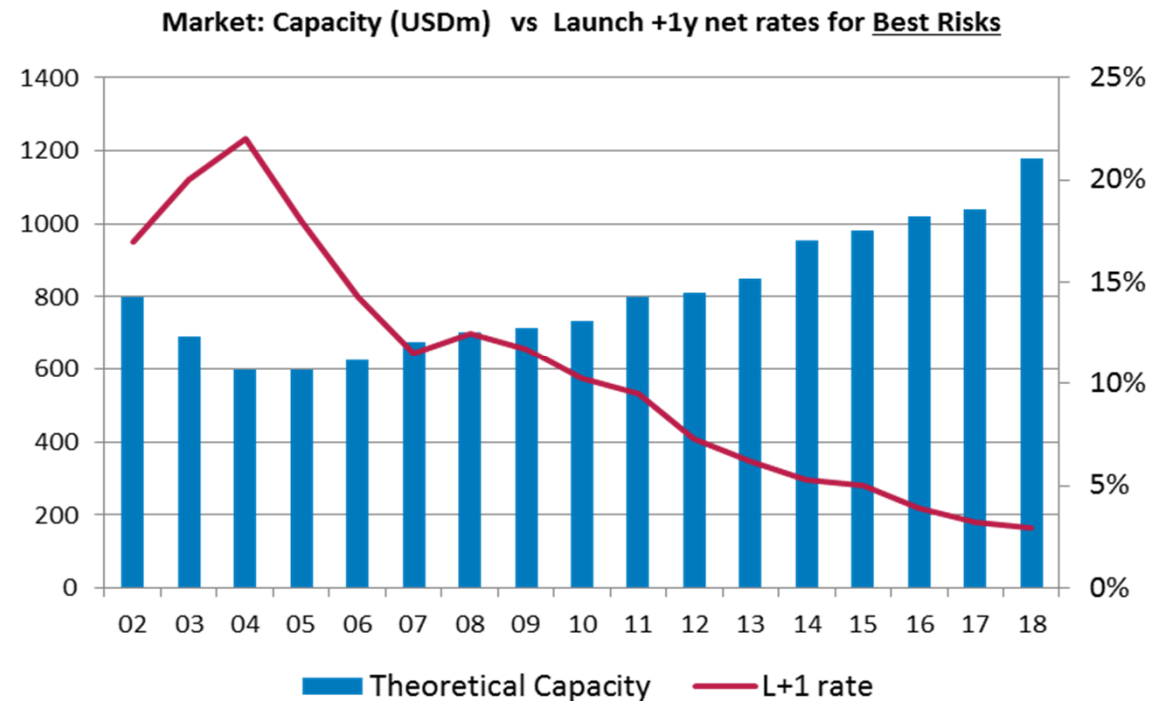
## State of the Space Insurance Market

Eric Richard  
21st of February 2019

# Space insurance market health status

Available capacity remains high and put prices under pressure

- Continuous increase of the available capacity for launch risks and in orbit over the past 13+ years
- Competition between insurers to get their share on a risk reduce pricing margins
- Launch and in orbit rates hitting an historical low for the « best » risks

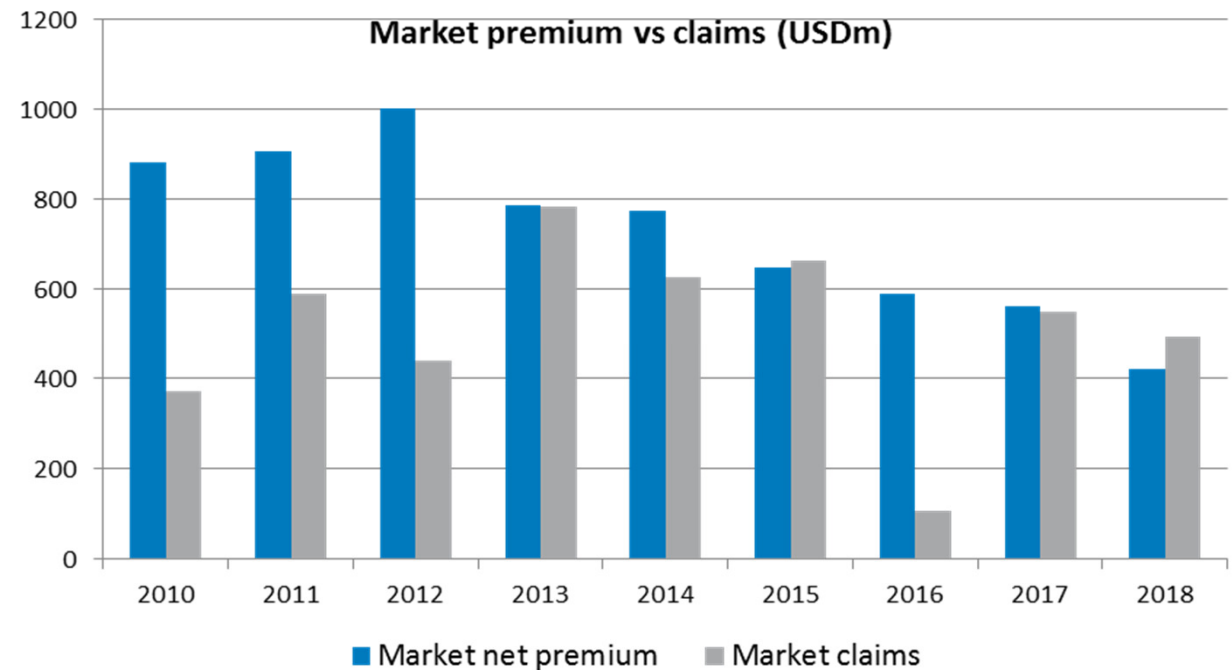




## Space insurance market results (2010-2018)

Premium volume decrease leads to a marginally profitable market

- Market premium volume steadily declining since 2012
- The aggregate overall exposure remains stable
- Max sum insured on a single launch greater than the yearly premium (2018 max exposure: USD567m)
- Is the current trend sustainable in the short term?



Risks accessible to the international insurance market

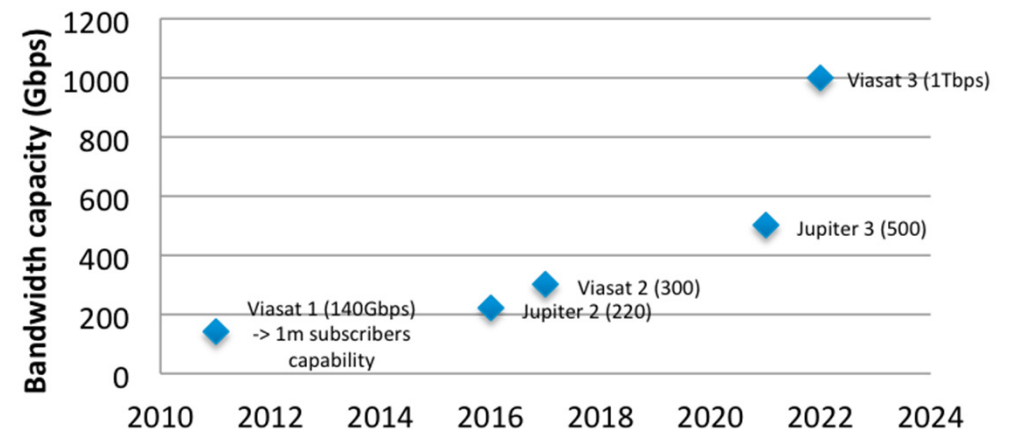
contract risk attaching per year

# Commercial Satellite Market Status

## Traditional operators facing new challenges: HTS vs LEO/MEO Constellations

- Most of the revenue on the commercial satellite market are still coming from TV broadcasting (77%)
- The TV contents are shifting from linear streaming to OTT contents
- The associated technology is part of expensive HTS assets with performances rapidly improving
- New Space and the multiple constellation projects are shaking the established order of GEO operators

Evolution of GEO Sat broadband capability

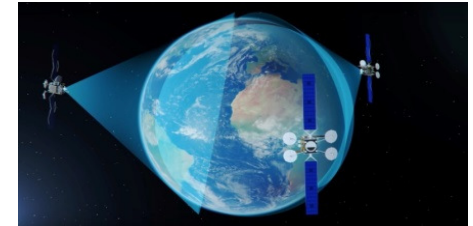


# Commercial Satellite Market Status

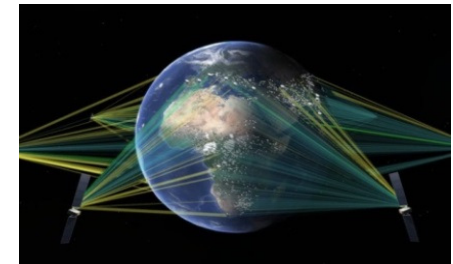
## Are LEO/MEO constellations a game changer to the GEO business?

- Multi-billion dollars constellation projects still to demonstrate their business case and the market share they could grab
- One Web, LeoSat, Telesat LEO, Starlink, There are risks:
  - Licencing rights globally
  - Ground antenna price
  - Ground retail (selling, installing & servicing)
  - Launcher availability and time to settle the whole constellation in orbit
  - Interferences with ground assets
  - Time before additional need of Capex
  - Financing...

Credit: Viasat / Viasat 3  
GEO constellation of 3 sat.  
(36,000km)



Credit : SES / O3B mPower  
MEO constellation of 7 sat.  
(8,000km)



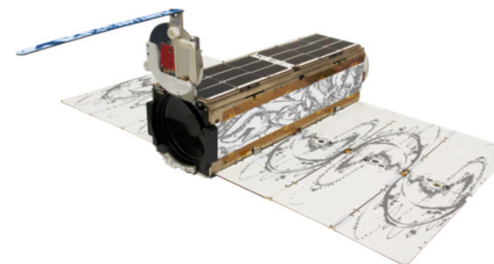
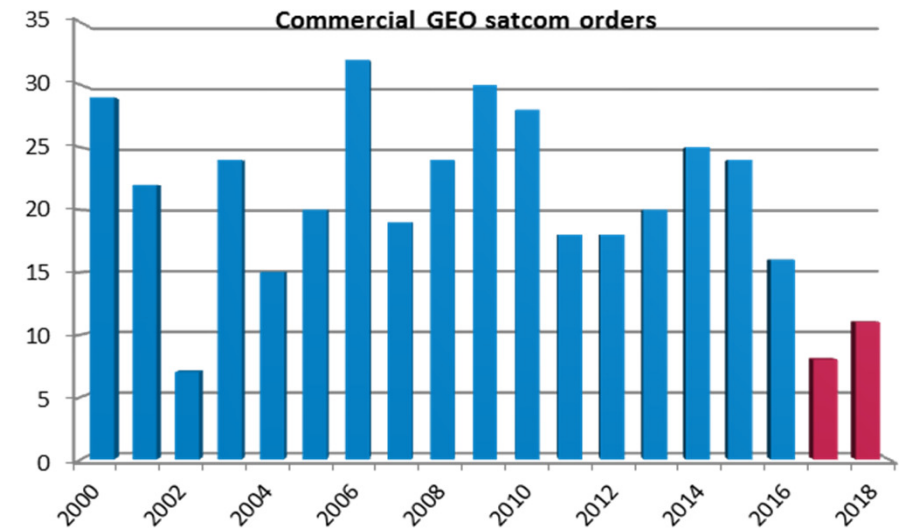
Credit: OneWeb  
LEO constellation of 600 sat.  
(1,200km)



# Commercial Satellite Market Status

## Traditional operators differ their CAPEX investment

- GEO Satcom orders historically low
  - Further pressure on the yearly premium volume
  
- At the opposite: smallsat market growth, make increasing revenues
  - 7,000 smallsats (580/year) by 2022, growing to 820/year by 2027 (constellations will account for 82%)  
Credit: Euroconsult
  - how many will be accessible to the insurance market?



Credit: Planet / Launched sats : 324

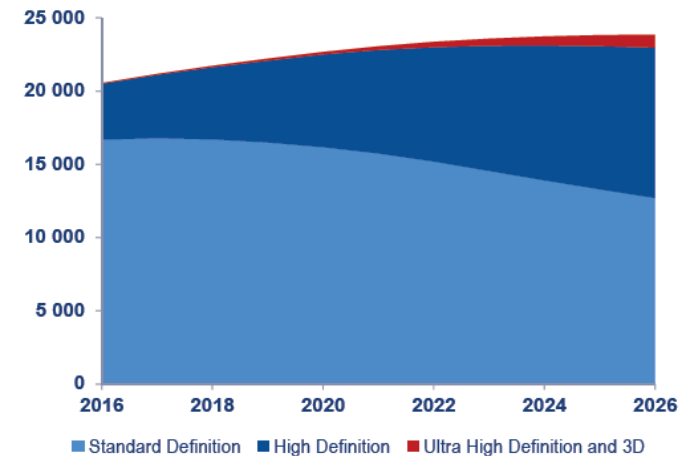


Credit: Spire / Launched sats : 85

# Commercial satellite market prospects

The Telecom market still has room to grow

- GEO Satcom forecasts :
  - Airbus (ADS): 15 to 18 p. year by 2025
  - Thales Alenia Space : 10 to 15 per year
  
- The worldwide deployment of HD, then 4K satellite TV channels is far from being achieved and will require increasing amounts of transponders & bandwidth in orbit
  
- 5G deployment
  - Satellite to become a powerful solution, complementary to the on ground operators where 5G will not be accessible



Satellite video channels forecast Credit: Euroconsult

Format	Modulation	MPEG-2	MPEG-4	HEVC
SD	DVB-S	~12	-	-
	DVB-S2	-	~26	-
HD	DVB-S	-	-	-
	DVB-S2	-	~9	~15
UHD	DVB-S2	-	-	~3

Number of channels per 36Mhz Transponder  
Credit: Eutelsat



# Underwriting methodology is key in this challenging environment



TOKIO MARINE  
KILN

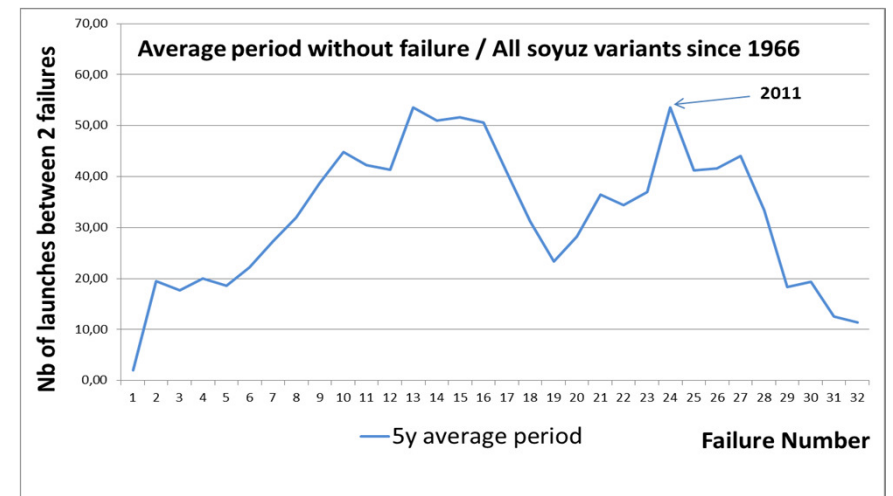
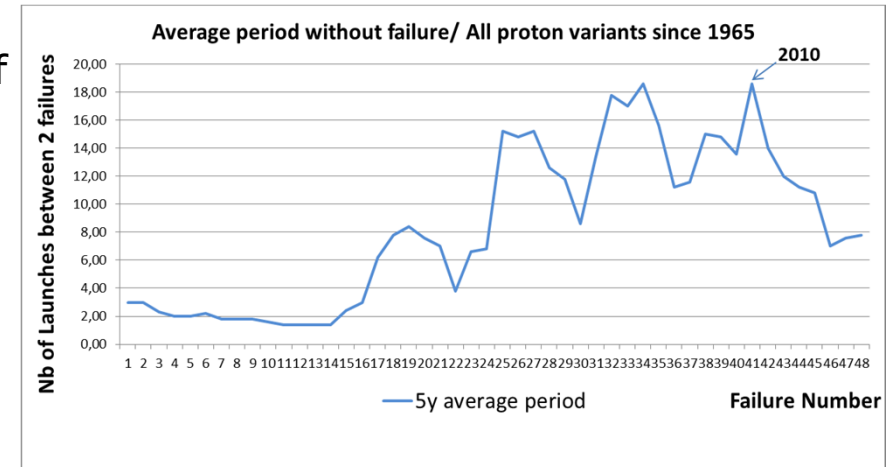
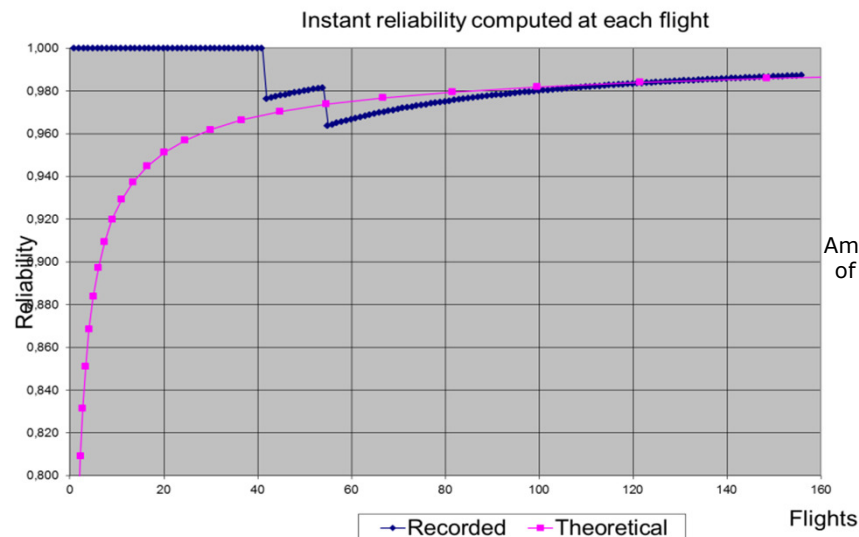




# Focus on Launcher reliability assessment at Tokio Marine Kiln

Launcher price differentiation strongly linked to past trend projection

- Launcher technology analysis: main stages, upper stage, engine technology, mission profile (number of burns, etc)
- AMSAA type modelization of the learning curve for a stable design
  - The model anticipate a regular decrease of the number of non conformances per launch
  - Does not predict workmanship failures



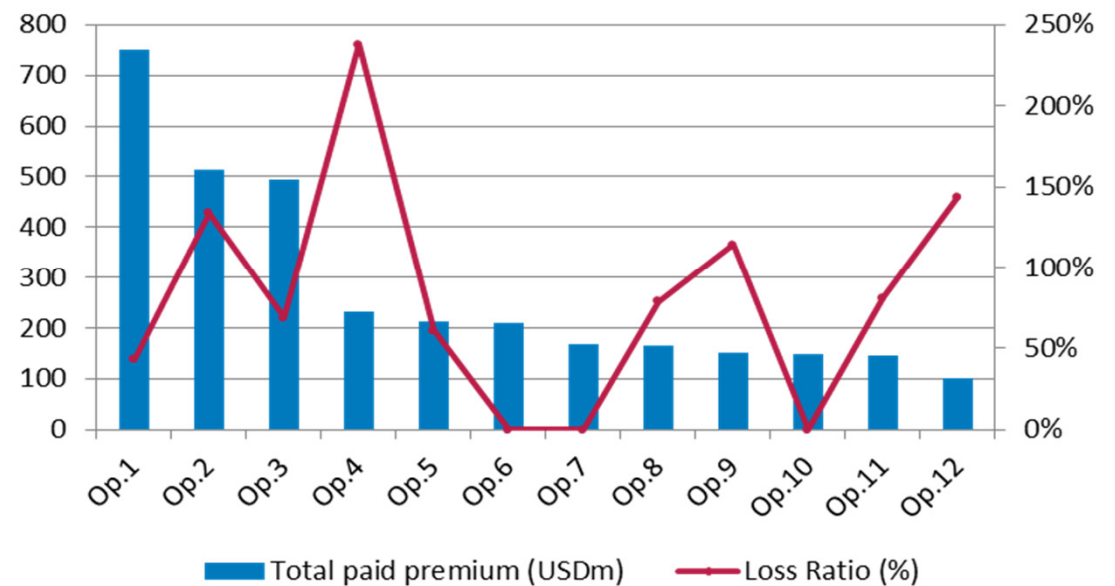
# Focus on Operators

## Premium vs Claim ratio (2010-2018)

Operators procurement philosophy plays a role in insurance analysis

- Significant differentiation between operators regarding their program SUCCESS (measured from insurance LR)
- Launch and satellite providers selection
  - A single launch failure will degrade the above ratio
- Monitoring of the whole supply chain is key
- As Underwriters we need operator methodology insight to provide appropriate insurance coverage

**Top 12 Operator total paid premium vs claims**



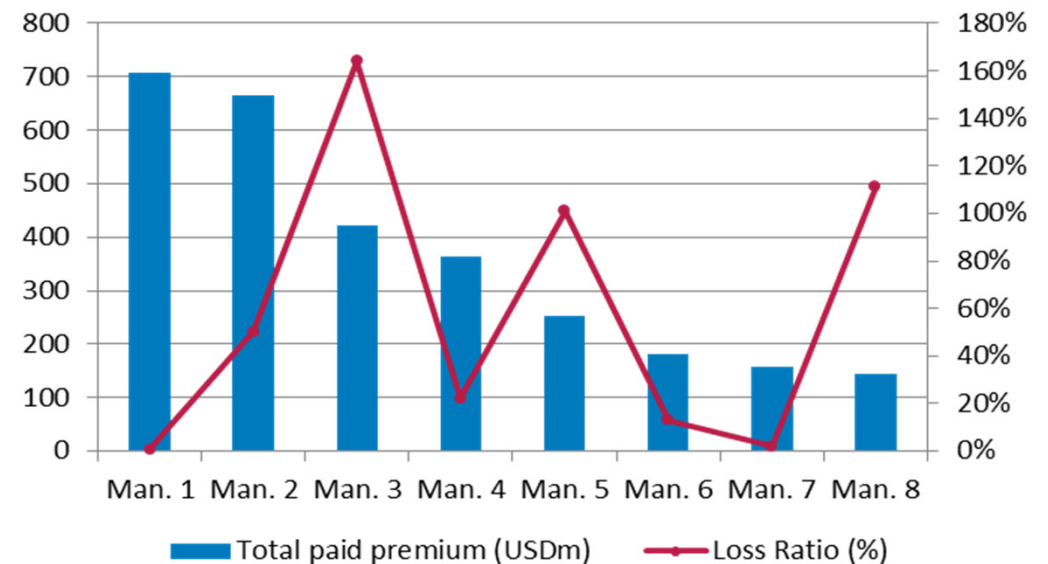
# Focus on Satellite manufacturers

## Premium vs Claim ratio (2010-2018)

Satellite manufacturers build the insurance market confidence through time

- Satellite related claims give manufacturers widely differentiated track records mainly based on:
  - Solar array issues
  - Antenna deployment issues
  - Propulsion engine failures, etc.
- Technical presentation: heritage, lessons learned from previous anomalies, Q&A, information insight help completing the risk analysis
- Visiting the manufacturer facilities bring an up-to-date overview of the company know-how (automation, quality, innovation, activities)

**Top 8 manufacturers: Premium vs Claims  
(Sat. Failure related)**

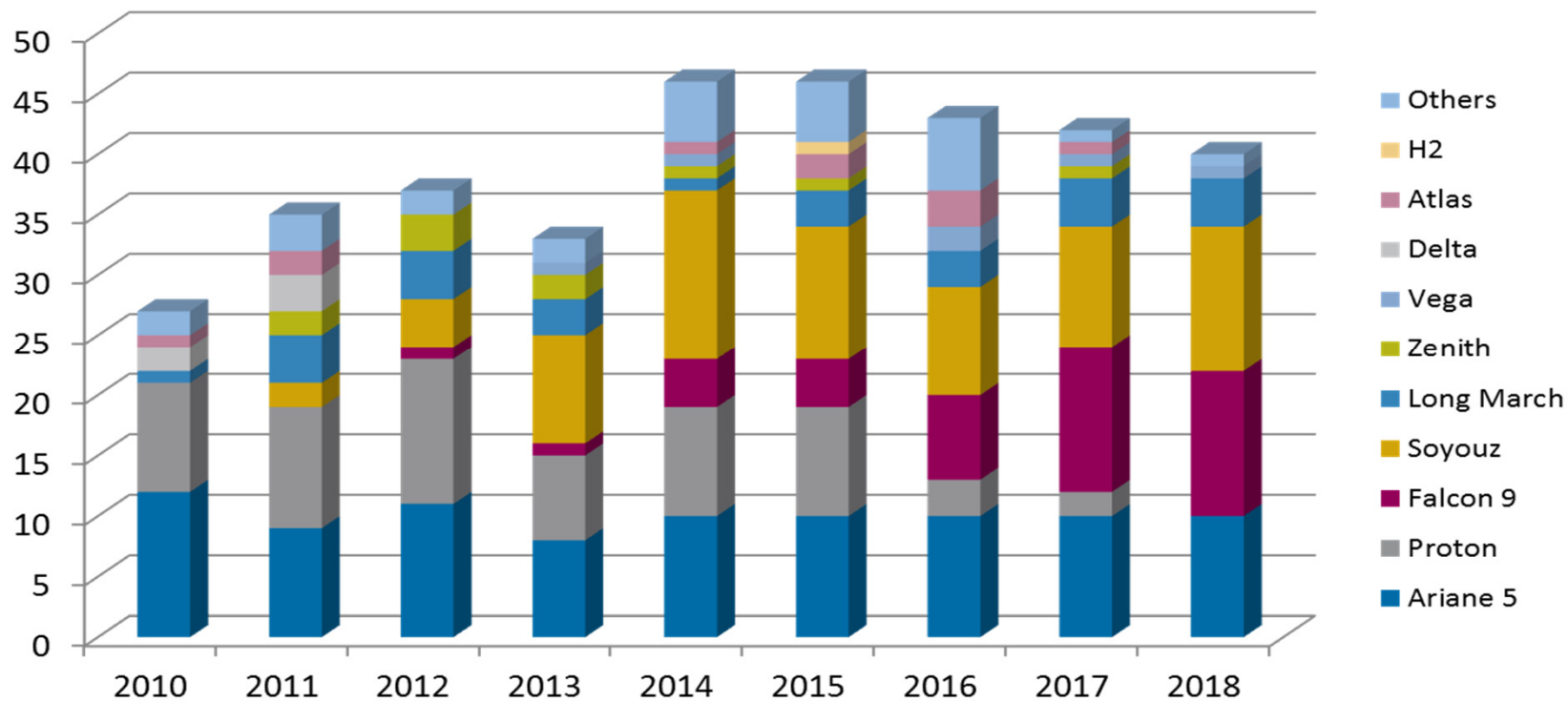




TOKIO MARINE  
KILN

# Launch vehicle landscape rapidly moving

Insured launched risks grouped by launch vehicle



- What will become the launcher business mix with next generation of vehicles: Angara, Soyuz 5, Ariane 6, BFR, New Glenn, H3, Vulcan, LM5, Yenisei?

## Space insurance market trend

- Operators capex will most probably focus on proven profitable business , meaning a split between GEO and constellation ?
- GEO market still has a lot of room for growth (bandwidth needs, replacing ageing satellites)
- Launch vehicle designs will widely be renewed starting from 2020
- Number of commercial projects and capital dedicated to space have never been this high
- A very challenging environment for insurers who aim at keeping reasonable profit margins.

