



space and technology

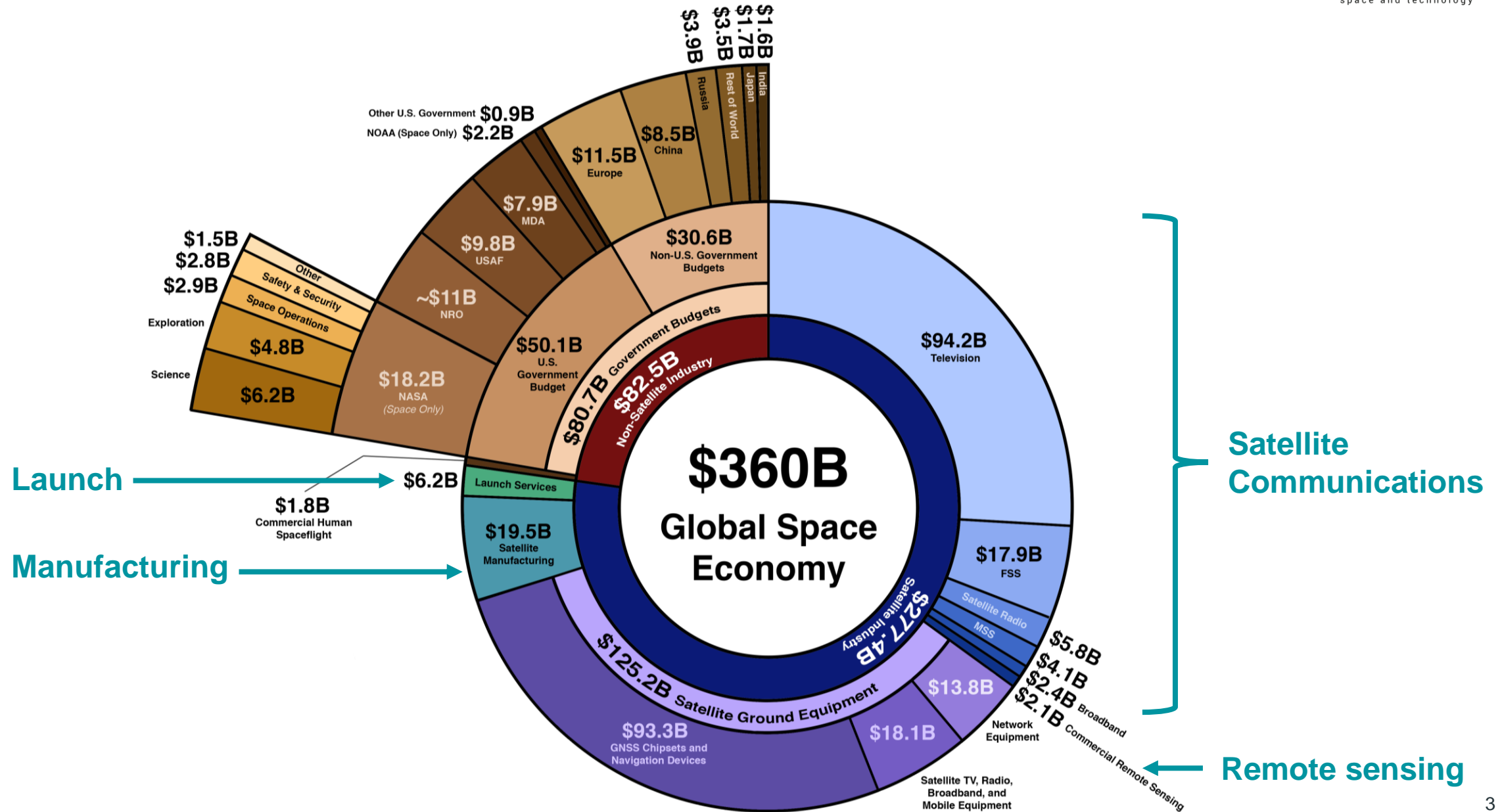
Commercial Space and Sustainability

June 25, 2019

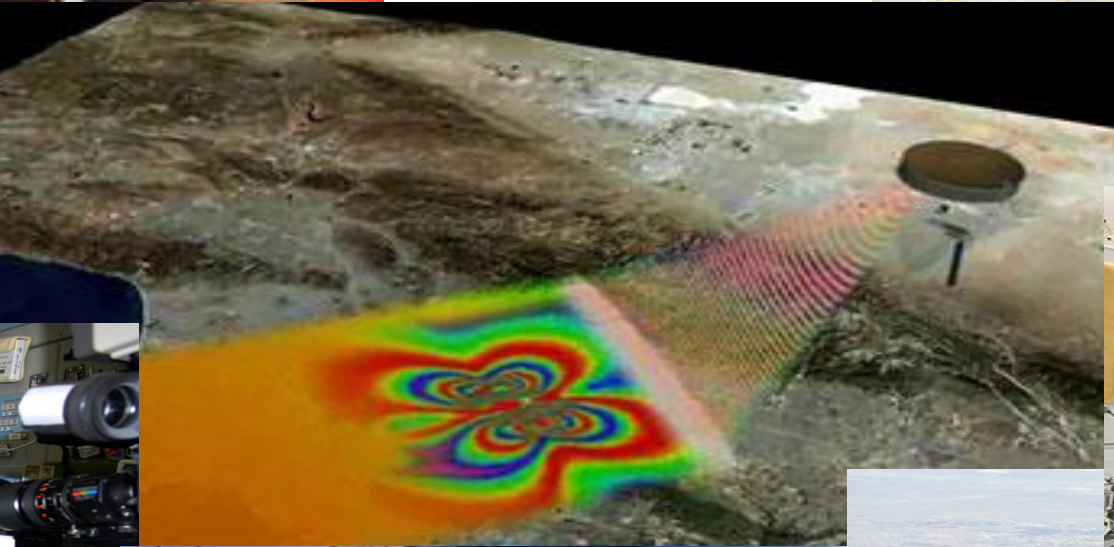
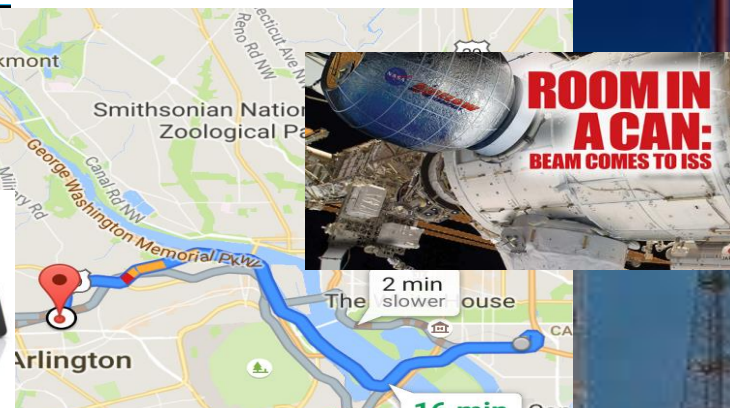
Nations Led the Space Age



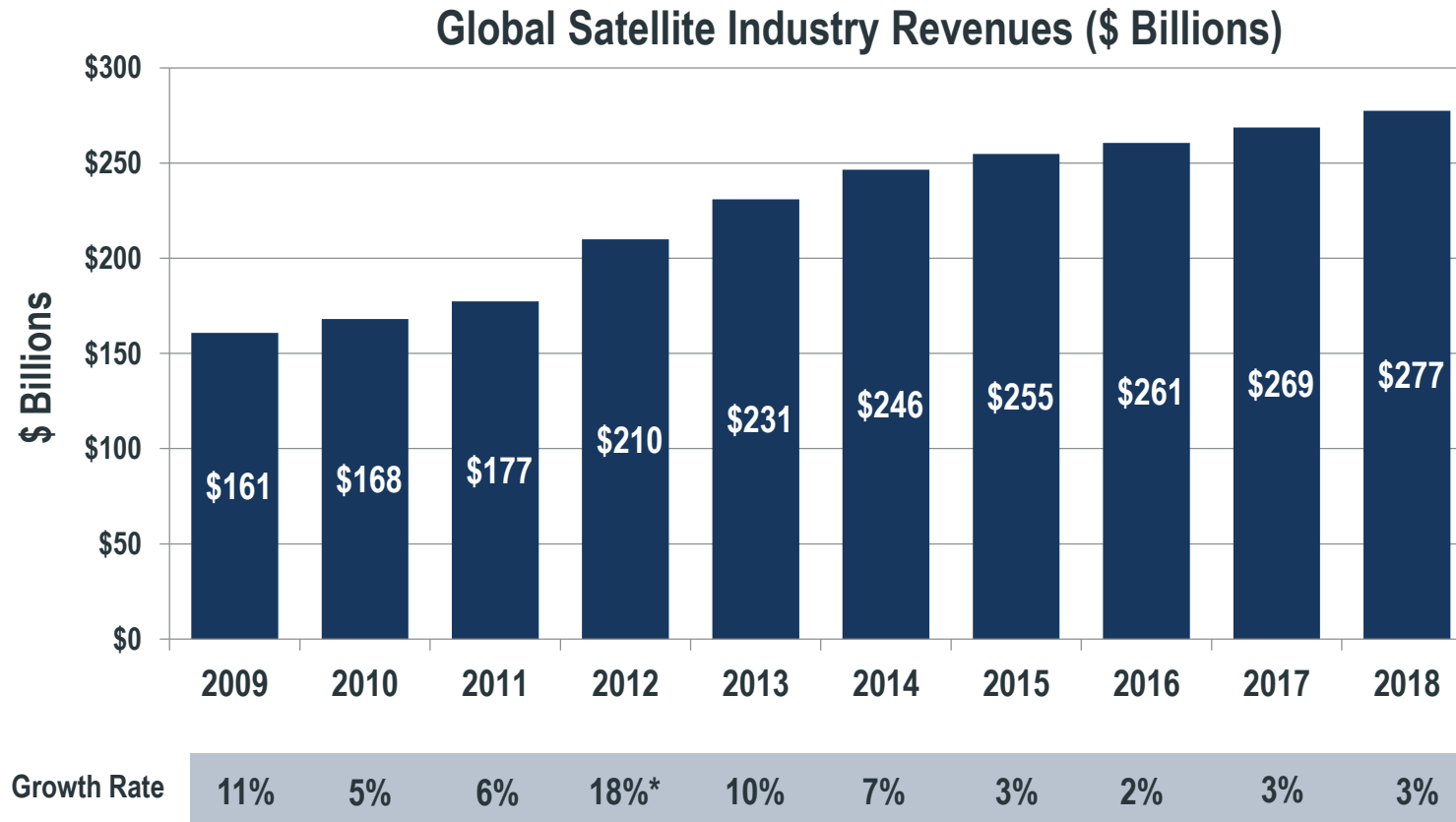

Today, Companies Dominate the Global Space Economy



What Do Commercial Space Companies Do?



Global Satellite Industry Revenue (2018)

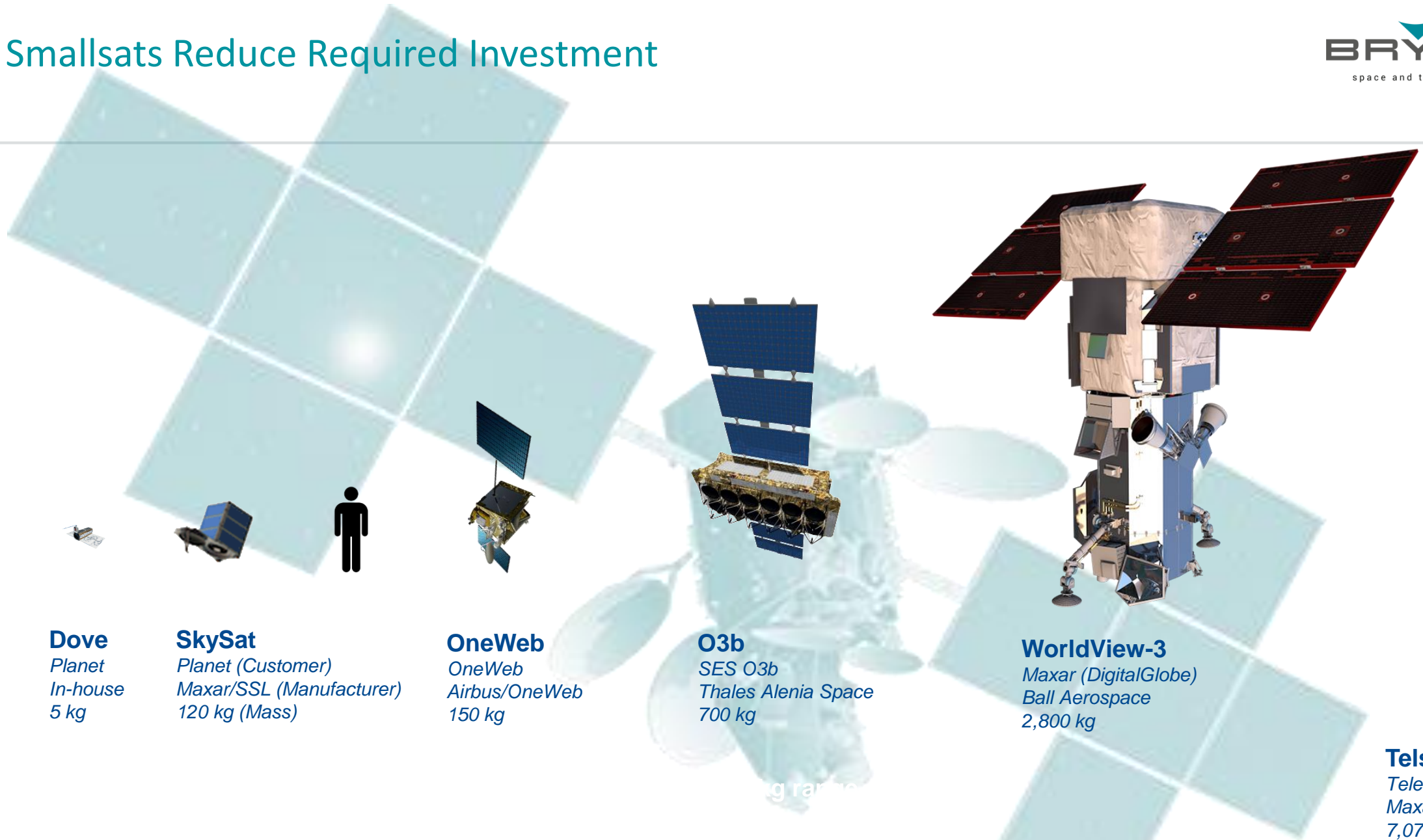
1.7X

Ten-Year
Global Industry
Growth

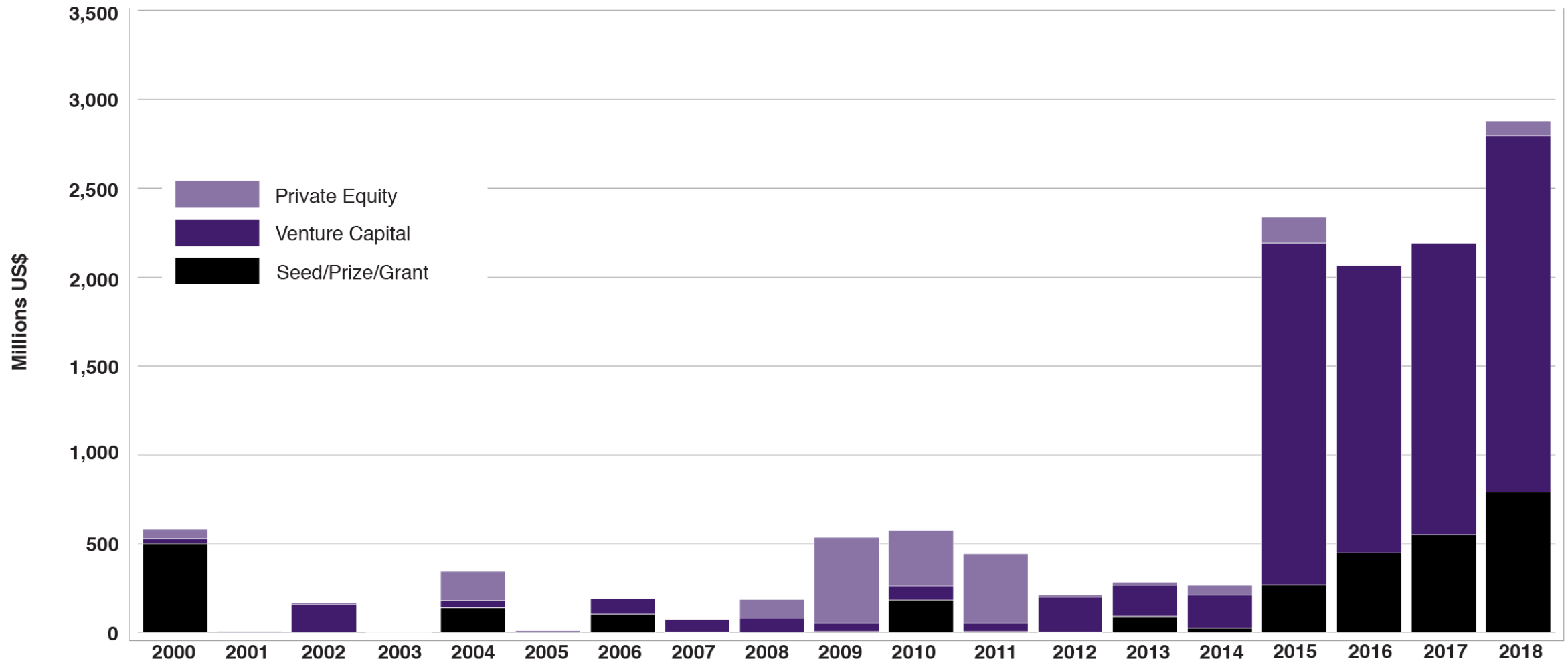
Global satellite industry grew 3% in 2018, tracking worldwide economic growth (3%) and U.S. growth (2.9%)

*Reported since 2017 and including years beginning with 2012, ground equipment revenues include the entire GNSS segment: stand-alone navigation devices and GNSS chipsets supporting location-based services in mobile devices, traffic information systems, aircraft avionics, maritime, surveying, and rail.

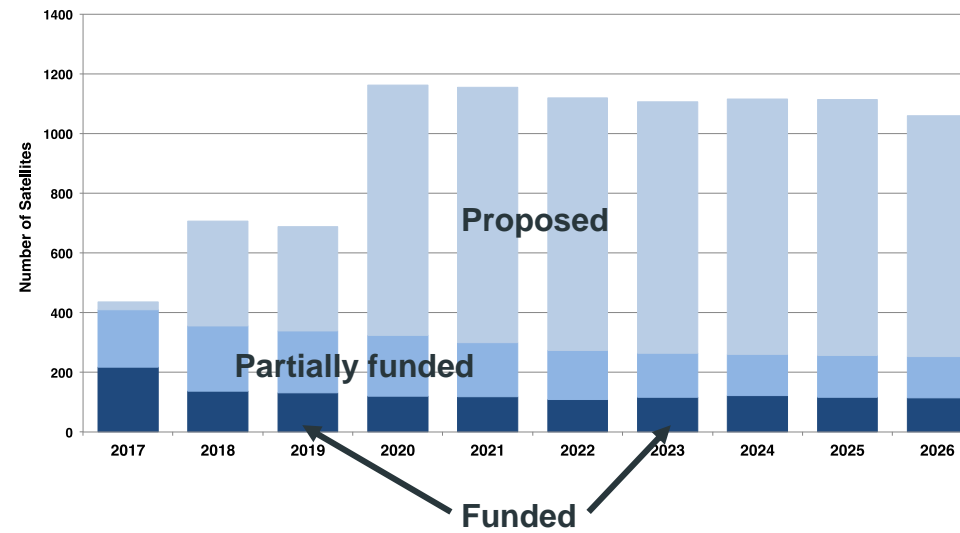
Smallsats Reduce Required Investment



Major Investor Type by Investment (2000-2018)



- ✓ The worry: new systems might create so much debris that it diminishes usability of Earth orbits
 - Smaller sats, limited ability to control their position
 - Lots of sats
 - Lower reliability sats
 - Compliance with regulations (lower cost systems, new actors)
- ✓ The reality: not all proposed satellites will launch – but many more will launch than in the past
- ✓ Key actors seeking solutions
 - USG/DOC
 - ESA
 - UN COPUOS
 - Secure World Foundation
 - World Economic Forum
 - Companies removing debris
 - Others



Source: Bryce analysis for AIA *Engine for Growth* report, 2017

