

July 25, 2024

**VIA ECFS**

Ms. Marlene Dortch  
Secretary  
Federal Communications Commission  
45 L St., NE  
Washington, D.C. 20554

**Re: Notice of Ex Parte Presentation**

Office of Economics and Analytics Public Notice on the State of Competition in the Communications Marketplace - GN Docket No. 24-119

Dear Ms. Dortch:

On July 24, 2024, the Satellite Industry Association (SIA) met with several members of the Office of Economics and Analysis by videoconference to present its annual State of the Satellite Industry Report which is relevant to the above-referenced docket. The following people attended from OEA:

Aleks Yankelevich, Liesl Himmelberger, Patrick DeGraba, Nathan Fraser, Irene Wu, Johannes Bauer, Catherine Matraves, Daniel Shiman, Donald Stockdale, Eugene Kiselev, Jason Shin, Lester Roberts, Cher Li, Amanda Betag, Braeden Vaughn, Catherine Matraves, Cole Campbell, Emily Talaga, Maciej Wachala, Mark Montano, Michelle Schaefer, Mohammad Ahmad, Eric Ralph, Giulia McHenry, Molly Schwartz, Nicholas Copeland, Patrick Sun, Stacy Jordan, Steven Rosenberg, Rachel Kazan, Weiren Wang, and Zaira Gonzalez.

Attending the meeting for SIA, in addition to myself, were Jennifer Williams, SIA, Nick Boensch, BryceTech and Ryan Puleo, BryceTech.

In the meeting, SIA presented the attached report with data relevant to the state of the satellite industry.

Please contact me should you have any questions.

Respectfully submitted,

**SATELLITE INDUSTRY ASSOCIATION**

By: */s/ Tom Stroup*

Tom Stroup  
President

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(202) 503-1560

Attachment

Cc: Nick Boensch  
Ryan Puleo

# SIA ✨

## State of the Satellite Industry Report

# 2024

  
**BRYCE**  
TECH

# SIA: Voice of the U.S. Satellite Industry

## Member Companies





# Study Overview



- ✦ SIA's 27<sup>th</sup> annual study of satellite industry data
- ✦ Performed by BryceTech
- ✦ Reports on 2023 activity derived from unique data sets, including proprietary surveys, in-depth public information, and independent analysis
- ✦ All data are global, unless otherwise noted
- ✦ Prior year revenues are not adjusted for inflation
- ✦ Satellite manufacturing and launch revenues recorded in year of launch

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## 2023 satellite industry revenue \$285B



### Satellite manufacturing: \$17.2B revenue

Growth in revenue of 9%. More commercially procured satellites deployed (20% increase over 2022), mainly smaller, lower cost satellites in LEO broadband constellations. Fewer exquisite national security surveillance satellites



### Satellite services: \$110.2B revenue

Continued increased demand for broadband, growth in burgeoning markets offset by continued changes in TV viewership. Remote sensing growing from mature operators and new companies



### Launch industry: \$7.2B revenue

Growth in revenue of 2%. Historic high number of launches in 2023. U.S. maintained the largest launch revenue share of any country. Increased launch rate driven by continued deployment of LEO broadband constellations



### Space sustainability activities: \$300M+ revenue

New commercial satellite activities beginning to generate revenue



### Ground equipment: \$150.4B revenue

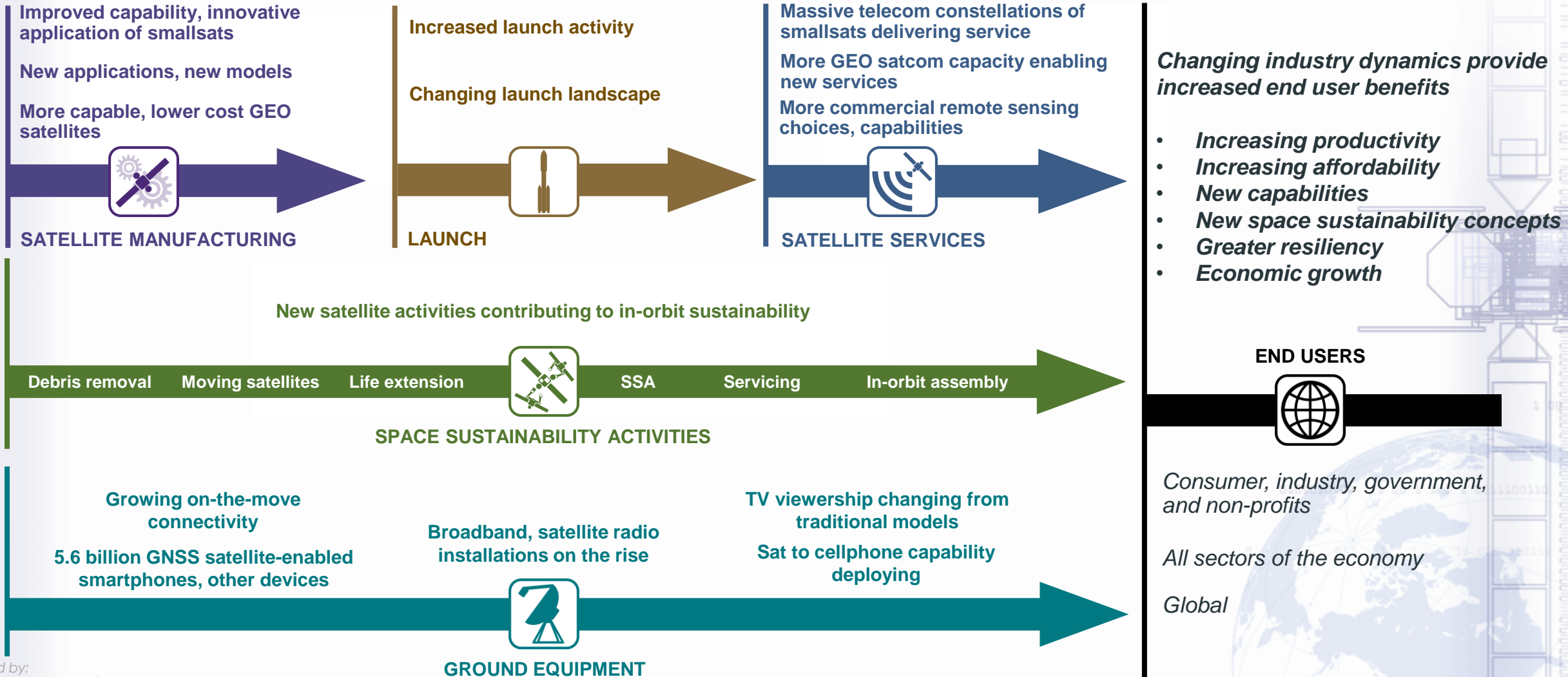
Continued growth in GNSS and network equipment revenues (3% and 10% increase from 2022, respectively). Television viewership changing from traditional models

**Global satellite industry revenue grew 2% in 2023. Growth in most segments, offset by decline in video. (Excluding video, the industry grew 5%)**

# Increasing Affordability and Productivity, New Capabilities



## Changing Industry Dynamics



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# Increasing Affordability and Productivity, New Capabilities

## Transformative Technology Innovation



### Satellite Manufacturing

**Flexible, software-defined payloads:** deliver speed, flexibility through reconfigurability; additional power

**Increasingly capable small satellites:** smaller and more sophisticated small satellites. Systems increasing mass to increase capability

**Scalable satellite manufacturing:** responsive satellite development at higher production rates for constellation development and deployment

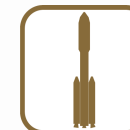


### Satellite Services

**Progress in spot-beam technologies:** enables high-throughput (HTS) and very high-throughput (VHTS) sats

**Inter-satellite links and optical communications:** mitigate dependence on ground stations and expand coverage for data relay, in-space communications applications

**Improved sensors:** radar, hyperspectral, RF mapping, radio occultation enhancements enable improved remote sensing services



### Launch

**Improved deployment/separation technologies:** enable launch of 100+ satellites on a single launch (record 143 satellites as of January 2021)

**Super-heavy lift development:** new launch vehicles targeting capabilities that will surpass historical vehicles



### Space Sustainability Activities

**Expanding ground and in-space sensors:** continued deployments of space situational awareness/space domain awareness sensors for identifying, tracking, and characterizing activity in space

**Orbital transfer vehicles:** support greater in space transportation and logistics applications



### Ground Segment

**Multi-orbit terminals:** enable resilient connectivity with multiple systems across various orbits, address high demand/congested areas and low-latency demand

**Cloud-integrated ground stations as a service:** enable operators to command and control satellites, and downlink, process, and store data in cloud architectures without need for dedicated ground infrastructure

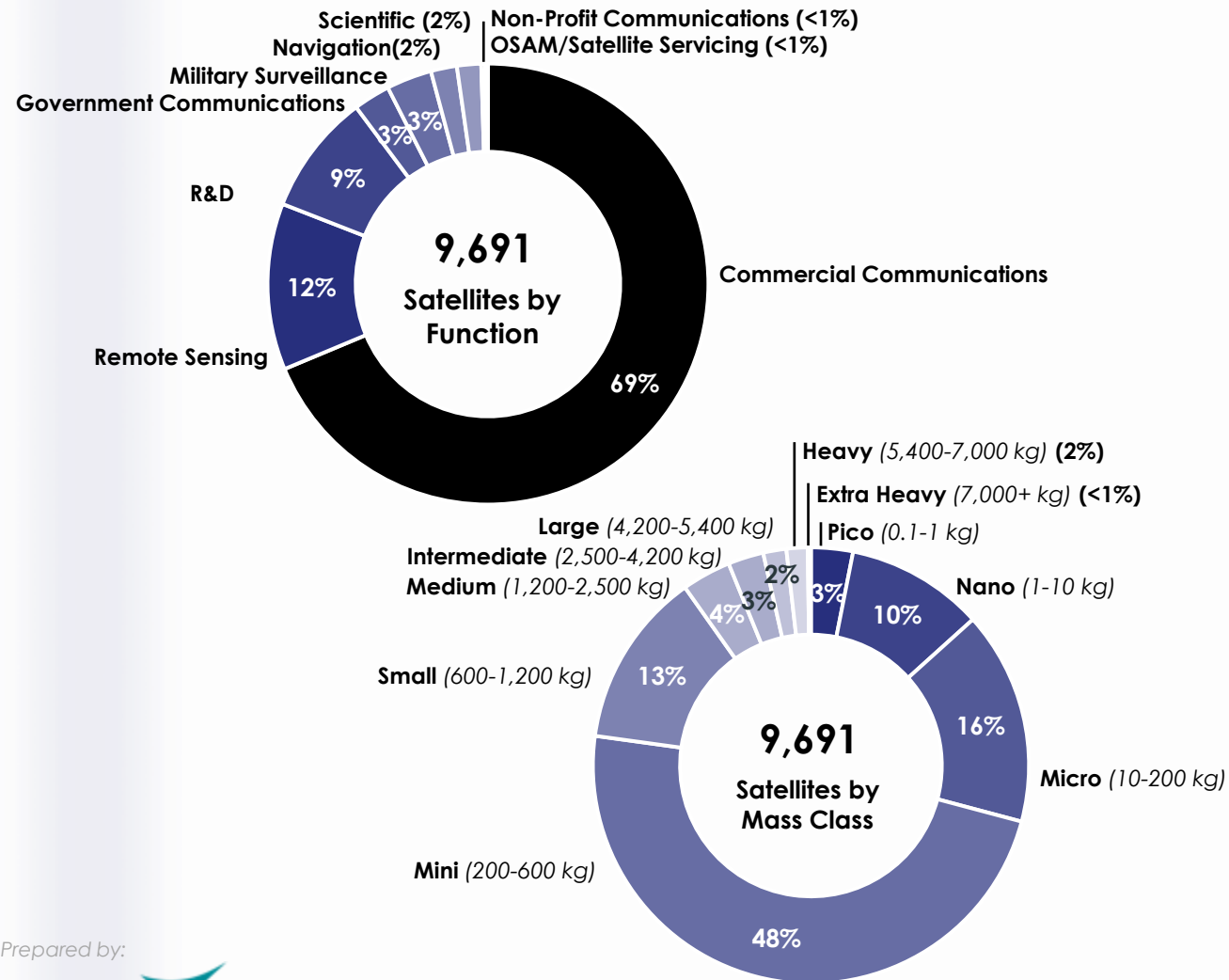
Satellite industry investment in technology delivers continual improvement in affordability and productivity, enabling new capabilities and creating new markets

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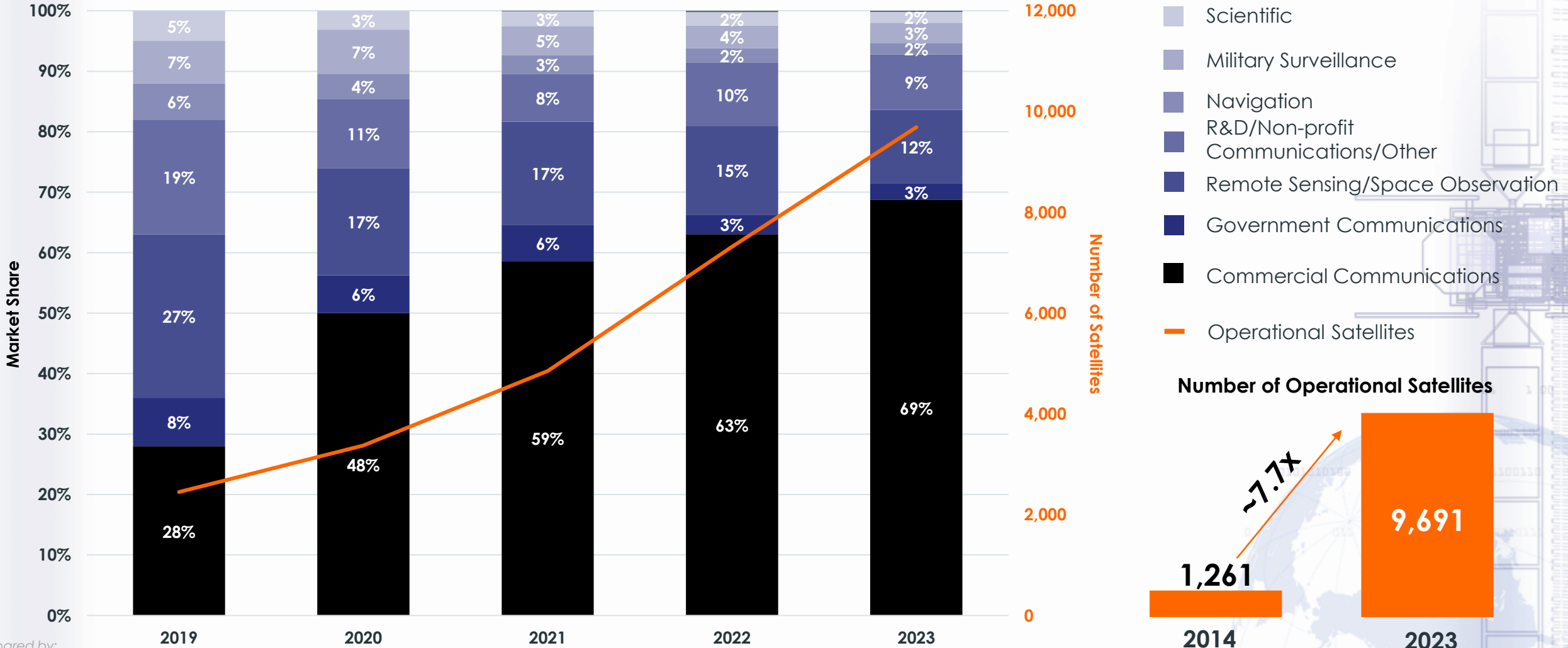
# The Satellite Network in Context



- ✦ Active satellites have increased 361% over 5 years (from 2,100 on December 31, 2018)
  - Record breaking 8,000+ smallsats deployed since 2020 (satellites ≤1,200kg)
  - About 3,600 metric tons launched since 2019
  - 625 active satellites in GEO (29 more than in 2022 mostly providing communications services)
  - 9,066 active satellite in NGSO (2,346 more than in 2022)
- ✦ 9,691 satellites operated by entities headquartered in 87 countries (some in regional consortia).
  - Since 1957 entities from 102 countries have deployed at least one satellite
  - U.S. entities operate 6,500+ satellites, some in partnership with other nations
- ✦ Estimated as of December 31, 2023

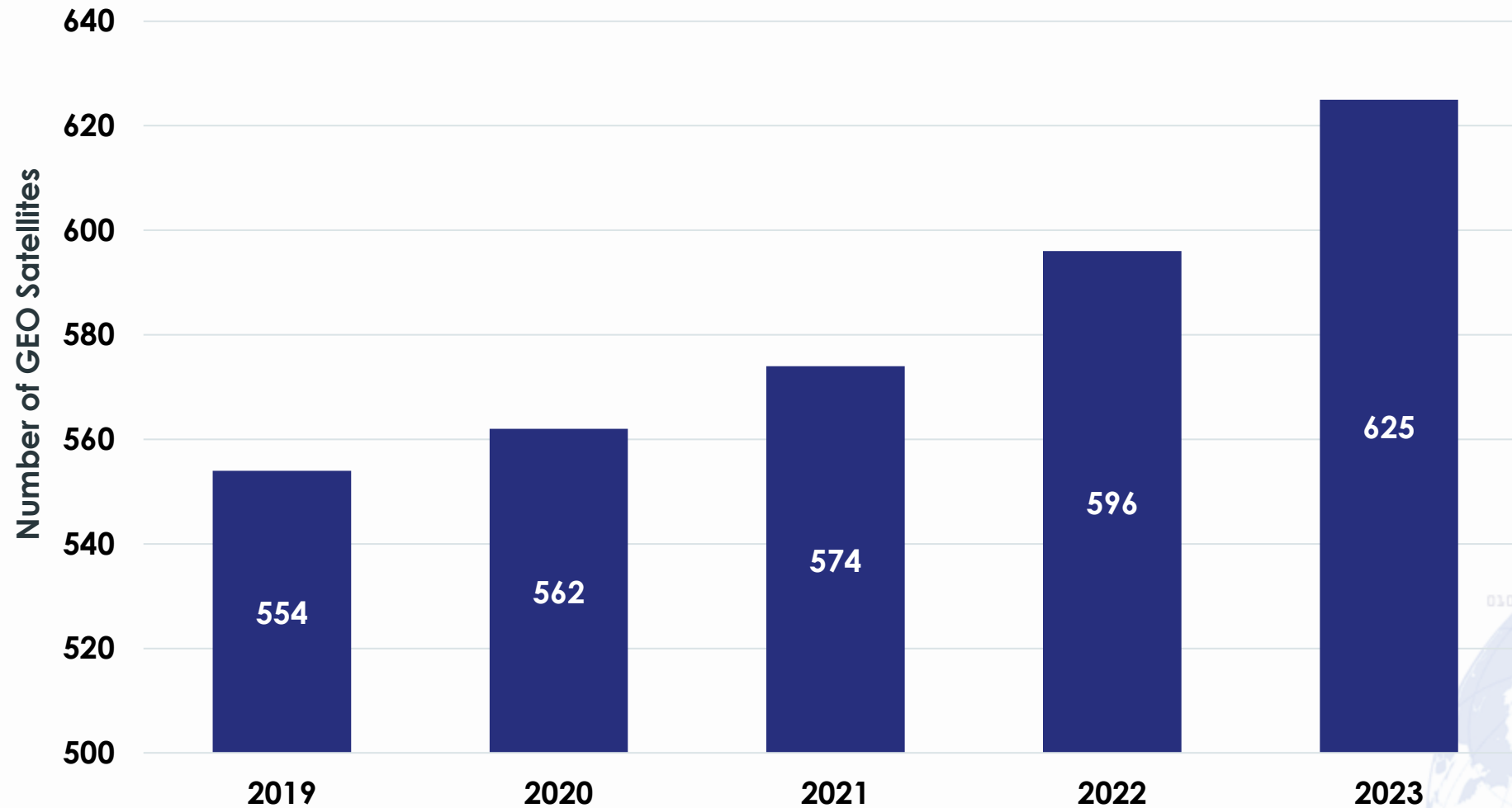
*Includes satellites active and on-orbit. Excludes defunct satellites*

# Operational Satellites, by Year



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# Operational GEO Satellites, by Year

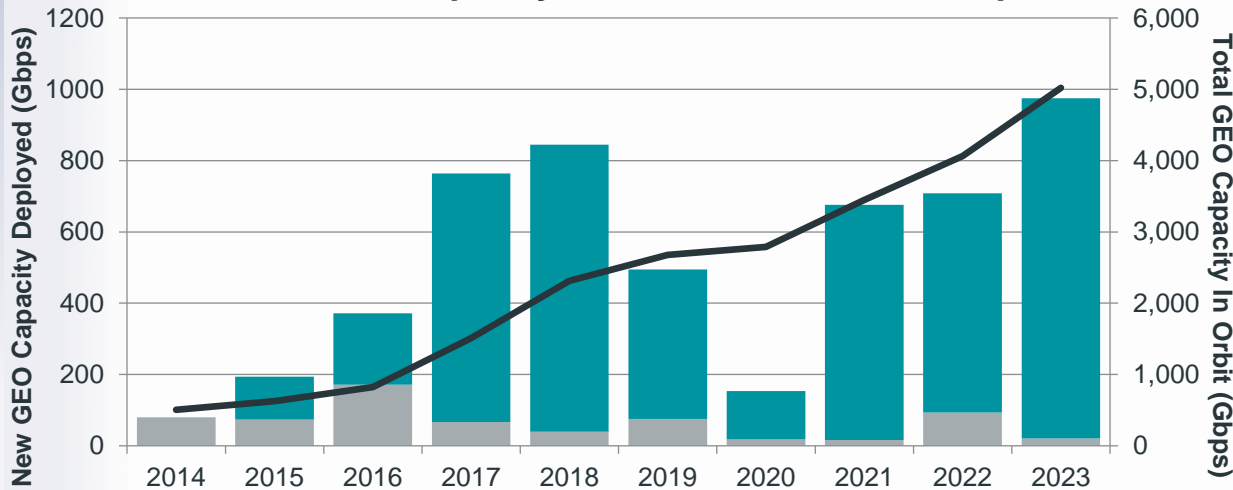


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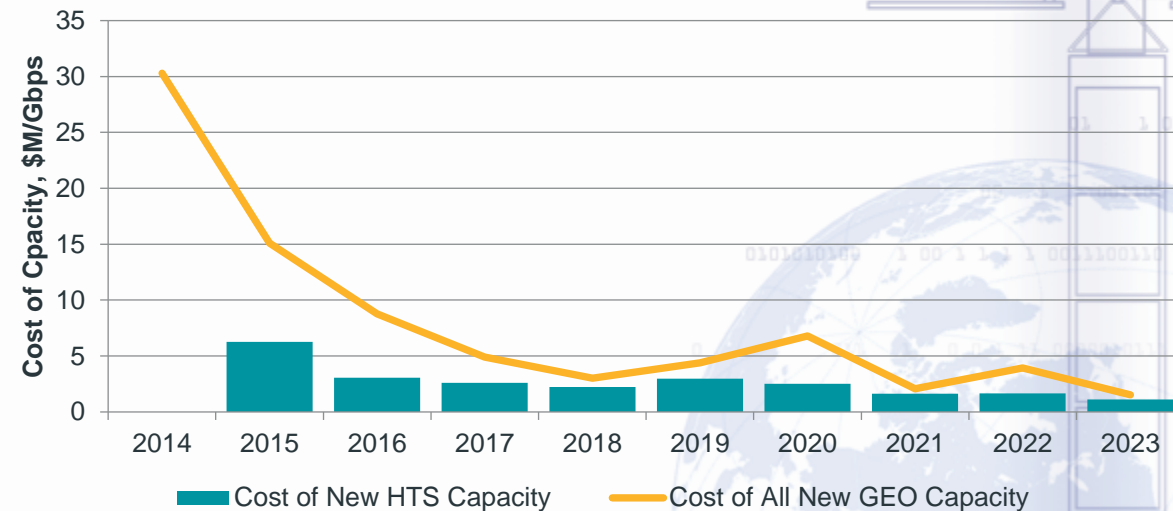
# New Satcom Capacity Deployment and Cost Trends

- ~1 Tbps HTS capacity deployed in 2023, resulting in lower overall manufacturing cost per Gbps
- Continued deployment of less expensive satcom capacity leads to more affordable satellite broadband connectivity, greater data volumes and speed offered
- NGSO systems continue deployments, totaling near 170 Tbps, though less capacity will be consistently usable
- As of 2024, operators plan to deploy nearly 150 Tbps through 2028
  - Over 3.5 Tbps total capacity GEO satellites under contract and in development
  - Over 140 Tbps total capacity from NGSO constellations in development

**New GEO Capacity, Widebeam and HTS, Gbps**



**Cost of New GEO Capacity, \$M/Gbps**



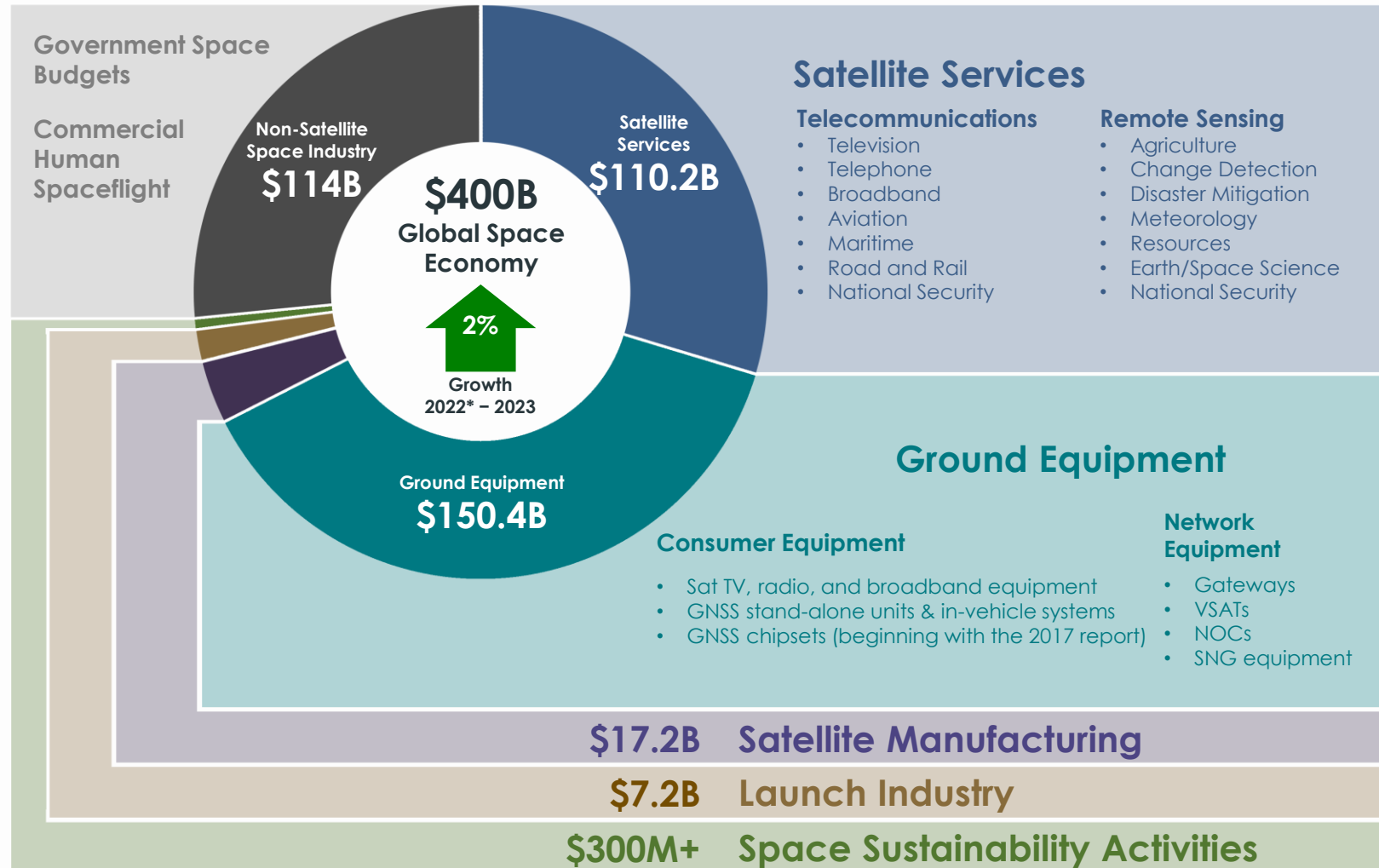
New Widebeam Capacity
  New HTS Capacity
  HTS Capacity in Orbit

Satellite capacity cost estimated based on satellite manufacturing prices.

Future capacity estimates reflect publicly announced plans and manufacturing contracts; some systems may not deploy.



# The Satellite Industry in Context

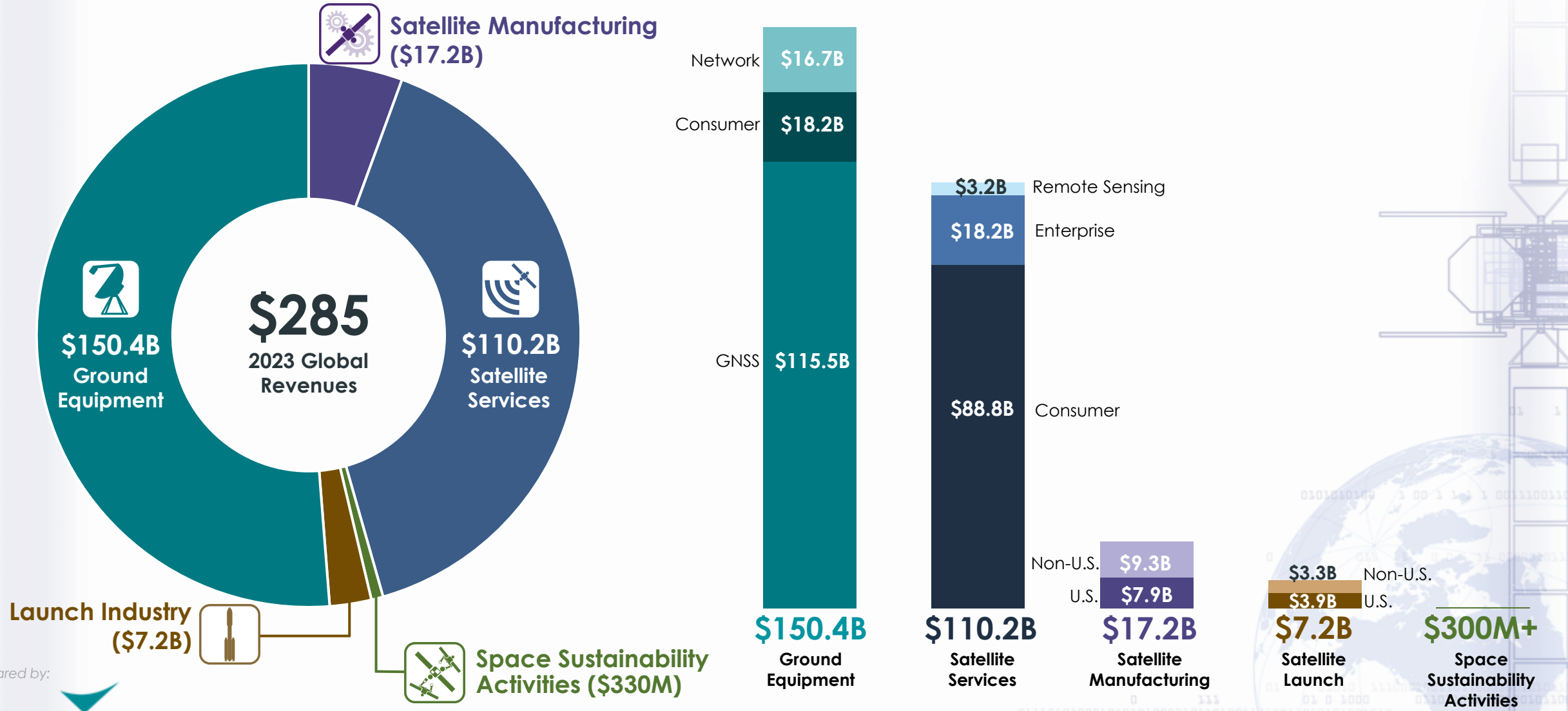


**\$285B**  
**Satellite Industry**  
 (71% of Space Economy)

\*Government space budgets include civil and military spending by 70 countries, ESA. Commercial human spaceflight includes commercial missions to ISS, suborbital and orbital flights.

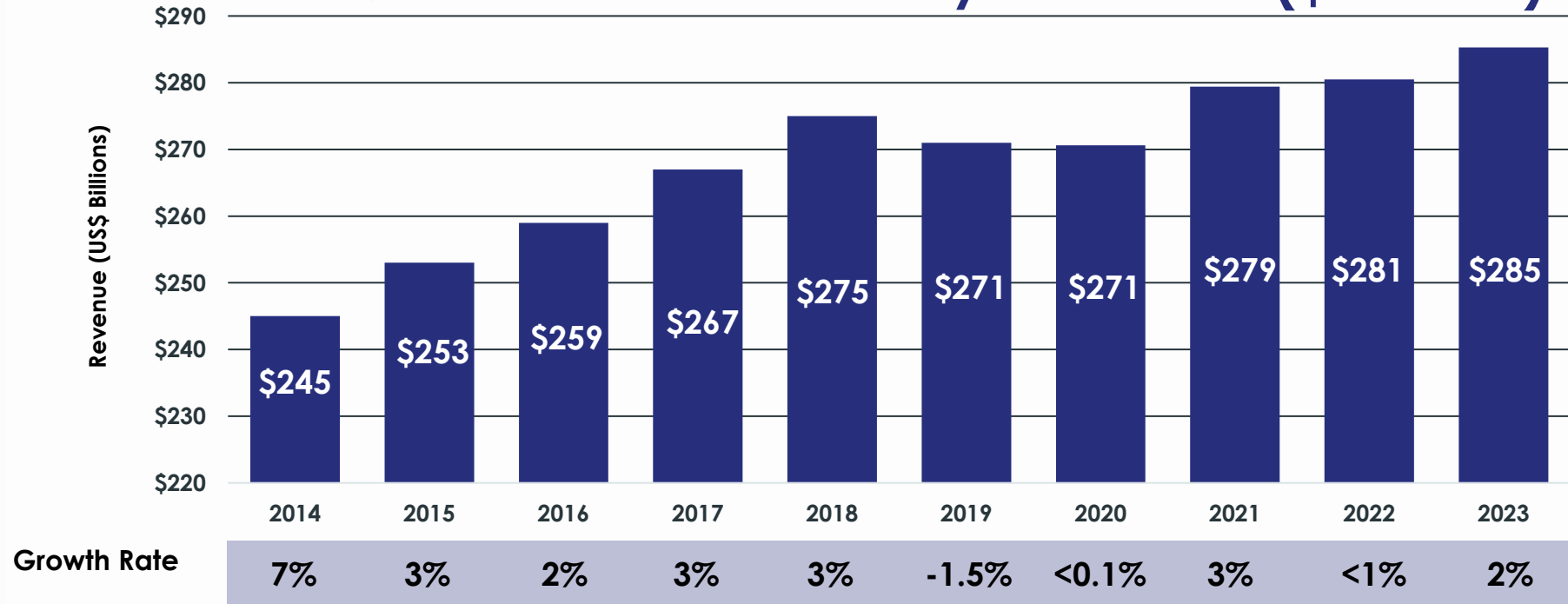
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# 2023 Satellite Industry Indicators Summary



# Global Satellite Industry Revenues

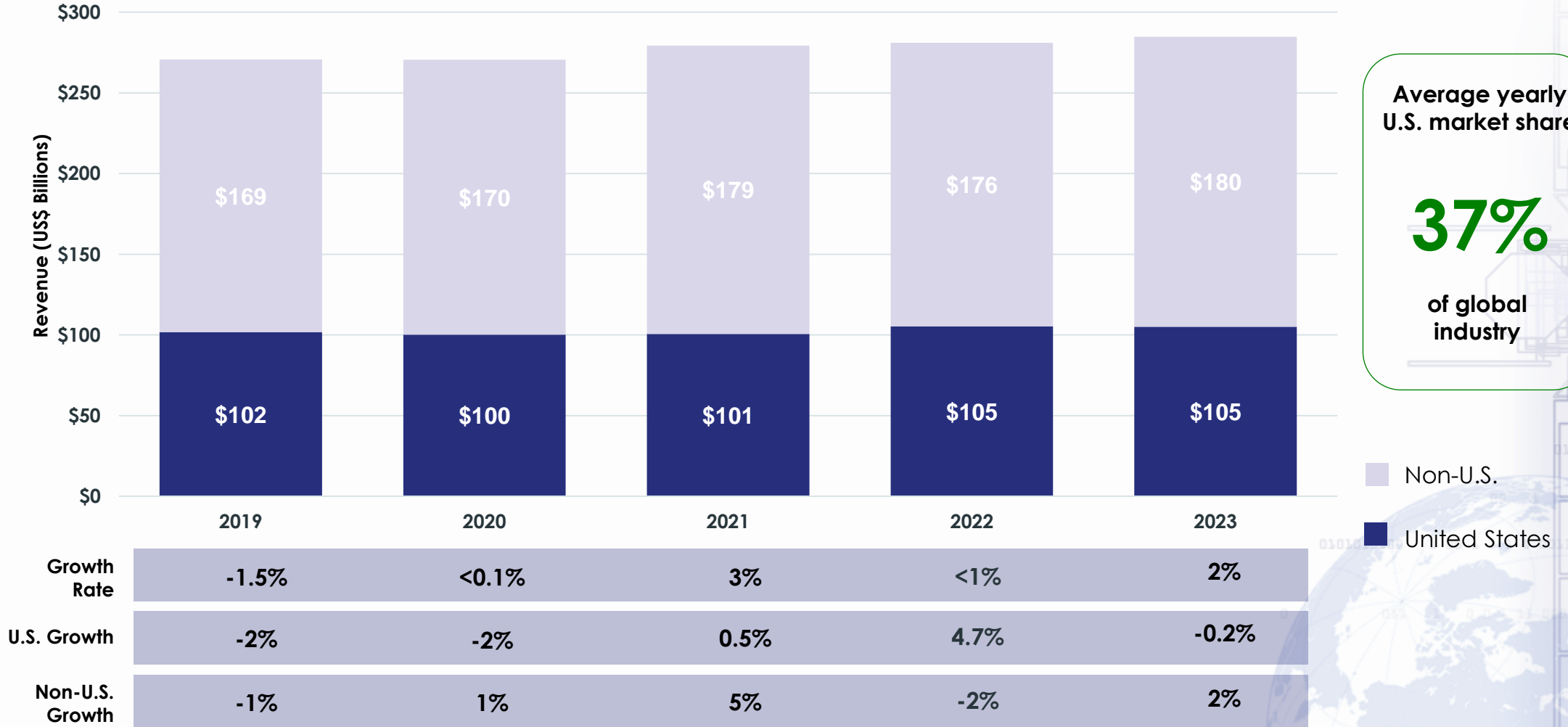
## Global Satellite Industry Revenues (\$ Billions)



**16%**  
Ten-Year  
Global Industry  
Growth

Global satellite industry revenue grew 2% in 2023. Growth in most segments, offset by decline in video. (Excluding video, industry grew 5%)

# Global Satellite Industry Revenues U.S. Share



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# Satellite Manufacturing

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# Satellite Manufacturing

## Changing Industry Dynamics



### Improved capability, innovative application of smallsats ( $\leq 1,200\text{kg}$ )

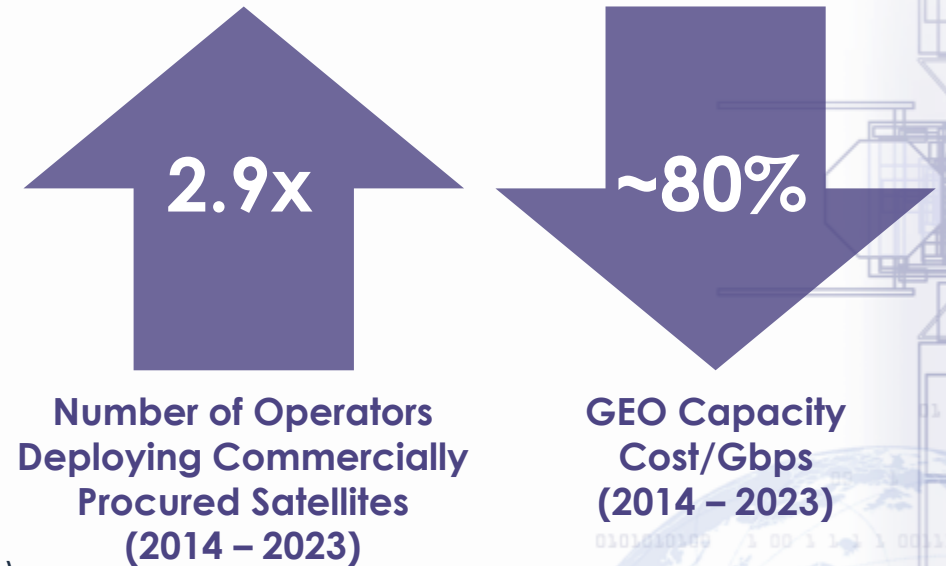
- ✗ Faster development, demonstration, and iteration
- ✗ Proliferated LEO broadband deployments continuing driving record increase in sats launched
- ✗ Diversifying GEO architectures
- ✗ Increasing government adoption of small satellites is changing space architectures, shaping space industrial base

### New applications, new models

- ✗ Growth in space-as-a-service models
- ✗ IoT/M2M, new types of remote sensing, space sustainability activities

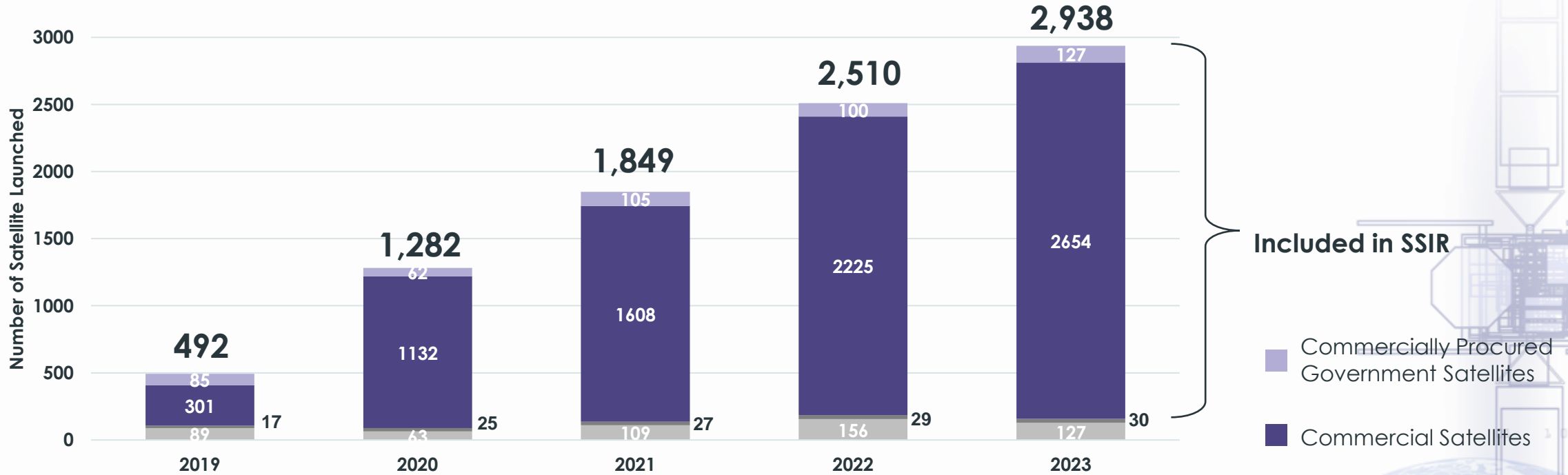
### More capable, lower cost large satellites

- ✗ Increase in throughput per kg launched (9x from 2014)
- ✗ Dramatic decrease in manufacturing cost/throughput (-80% from 2014)
- ✗ Flexible/software-defined payloads for efficient on-orbit use





# Satellite Manufacturing: Methodology



## ✘ Included in SSIR: commercially procured satellites

- Commercial satellites: satellites manufactured under internationally-competed contracts or produced in-house by privately-funded organizations. Revenues include estimates of in-house transfers
- Commercially-procured government satellites: manufacturing contracts typically captive or competed among national manufacturers

## ✘ Not included in SSIR

- Spacecraft other than satellites: crew and cargo vehicles and some other spacecraft
- Satellites not procured commercially: satellites produced in-house by a government agency or a university

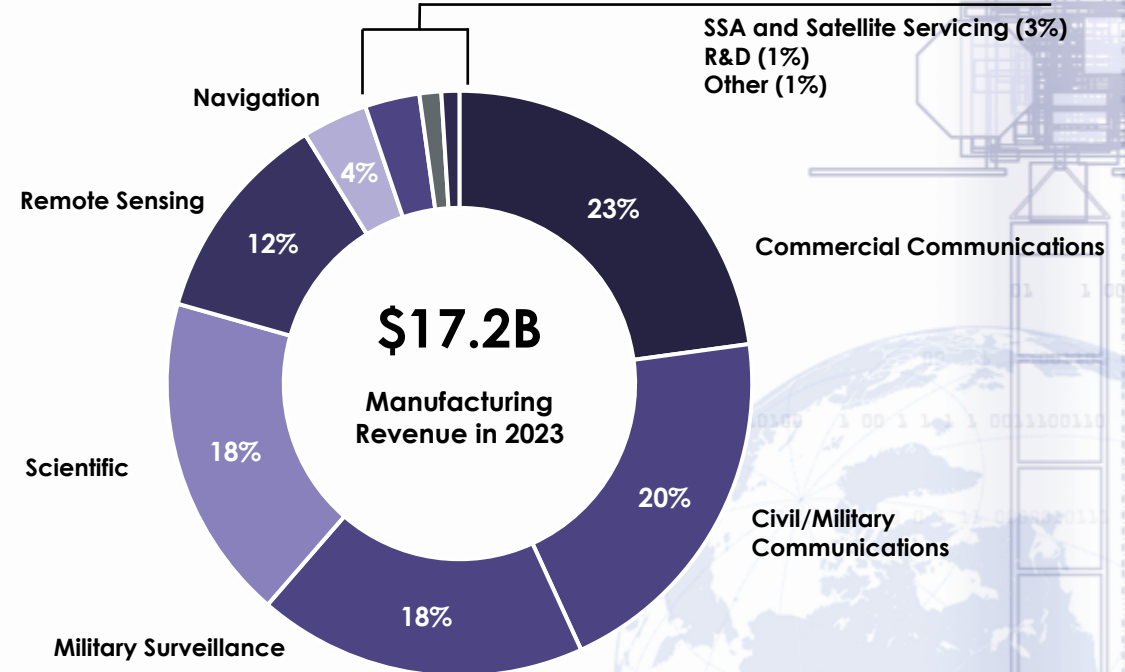
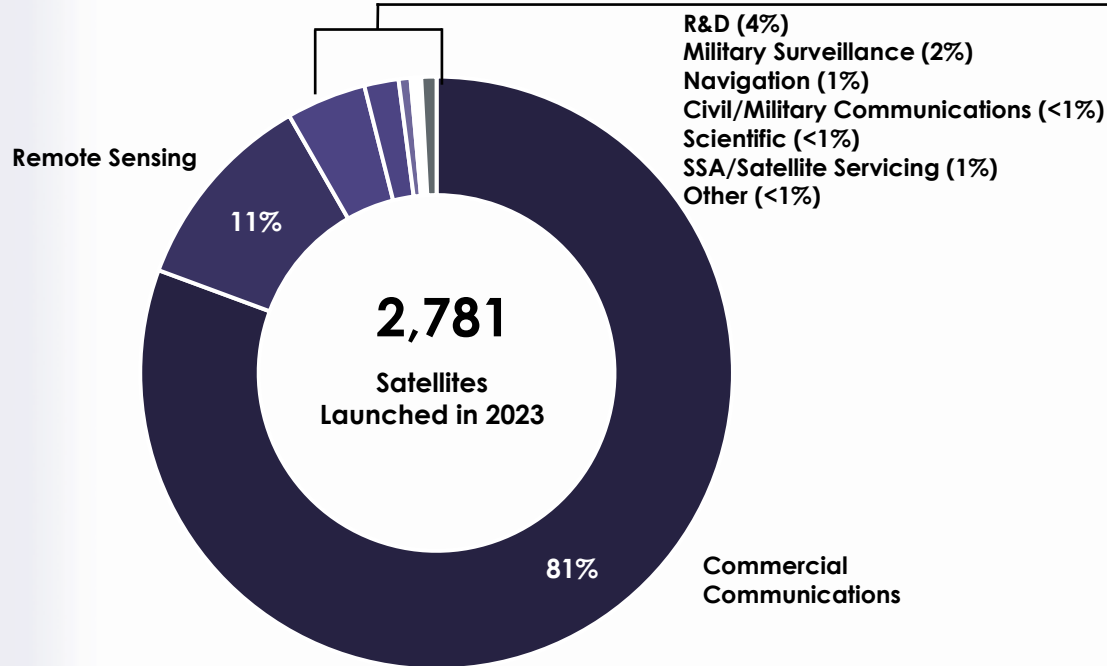


# Satellite Manufacturing Findings



- Worldwide 2023 revenues totaled \$17.2B; increase of 9%
- 2,781 commercially-procured satellites launched in 2023; 456 more than in 2022
- 2,727 commercially-procured smallsats ( $\leq 1,200\text{kg}$ ) launched (2,272 in 2022)

- Commercial communications satellites represented 23% of total revenues, compared to 22% in 2022
- Military surveillance satellites accounted for 18% of revenues, compared to 48% in 2022



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Number of Satellites Launched, by Mission Type

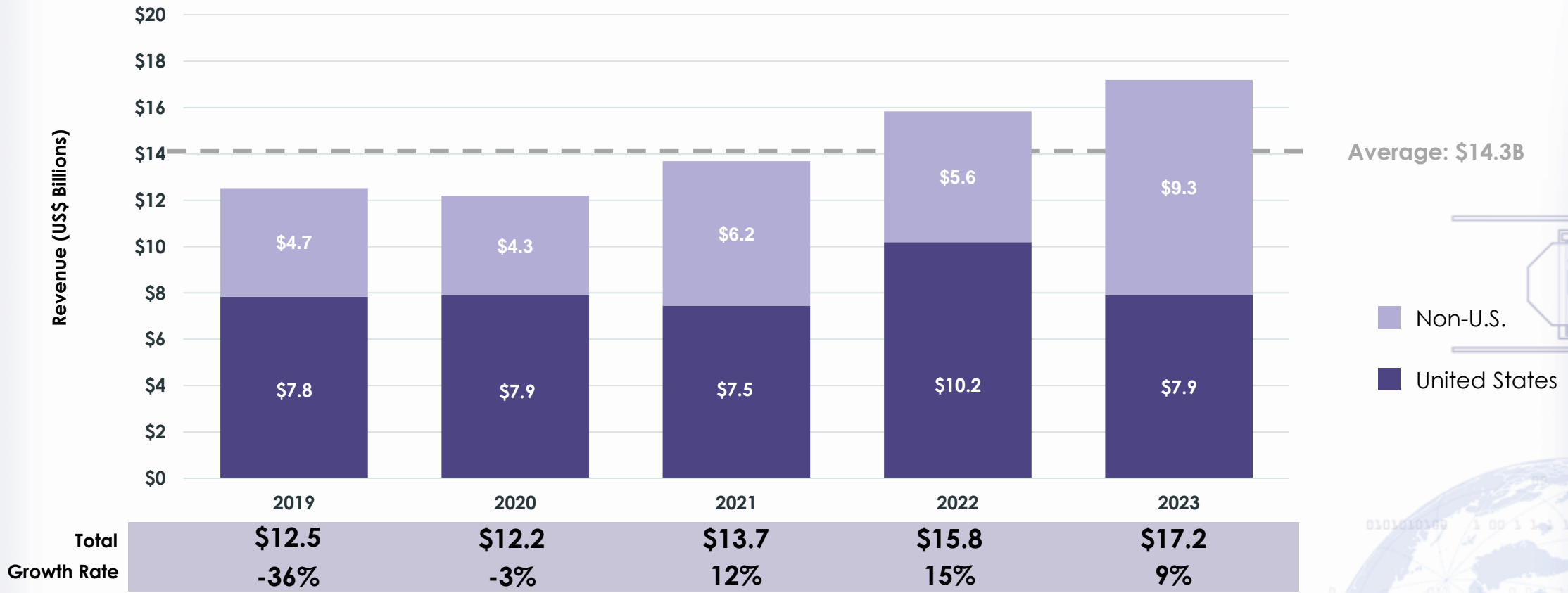
Manufacturing Value of Satellites Launched, Estimated by Mission Type







# Satellite Manufacturing Revenues

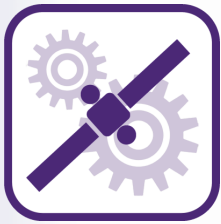


- ✦ Worldwide 2023 revenues totaled \$17.2B
- ✦ In 2023, U.S. share of global revenues declined to 46% from 64% in 2022

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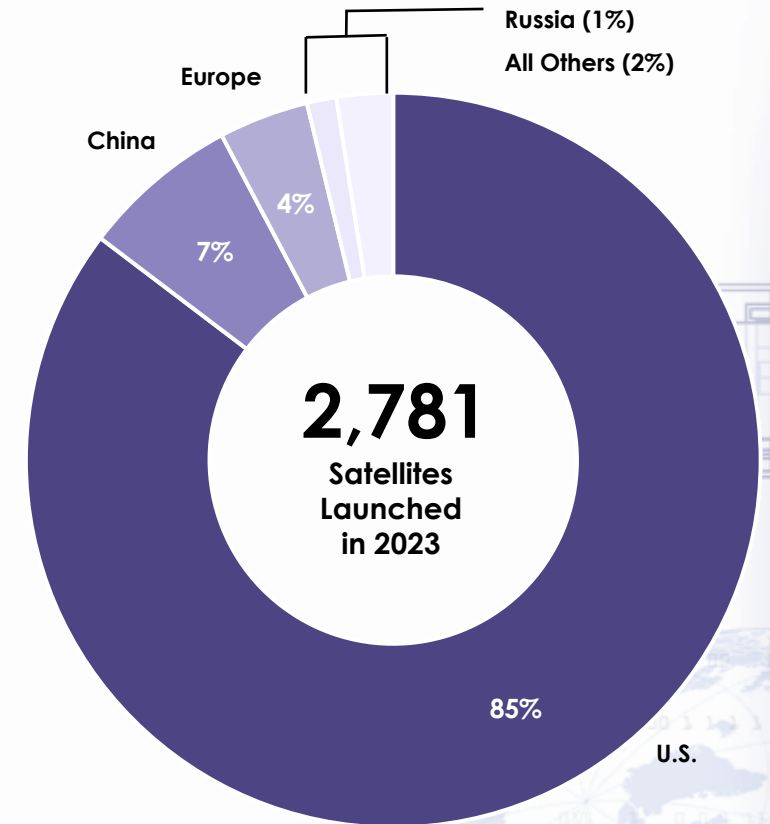
Satellite manufacturing revenues are recorded in the year of satellite launch. Do not include satellites built by governments or universities. Data based on unclassified sources.



# Satellite Manufacturing: Industry Findings and U.S. Highlights



- ✦ U.S. firms built about 85% of commercially procured satellites launched in 2023 and earned 46% of manufacturing revenues
- ✦ U.S. satellite manufacturing revenues 22% lower
  - Commercial sector 58% higher, government sector 49% lower
  - 55% of U.S. revenues from U.S. government contracts
  - Lower gov. revenue due to fewer deployments expensive intelligence satellites
- ✦ Massive rollout of LEO broadband constellations continued in 2023, dominated by US manufacturing
- ✦ Smallsats ( $\leq 1,200\text{kg}$ ) accounted for 98% of satellites deployed, and 21% of global revenue

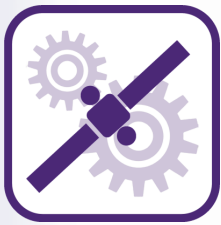


**2,781**  
Satellites  
Launched  
in 2023

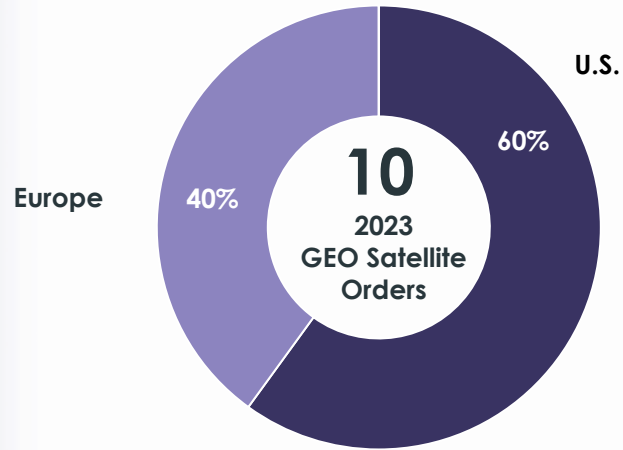
Number of Satellites Launched by Country/Region of Manufacturer

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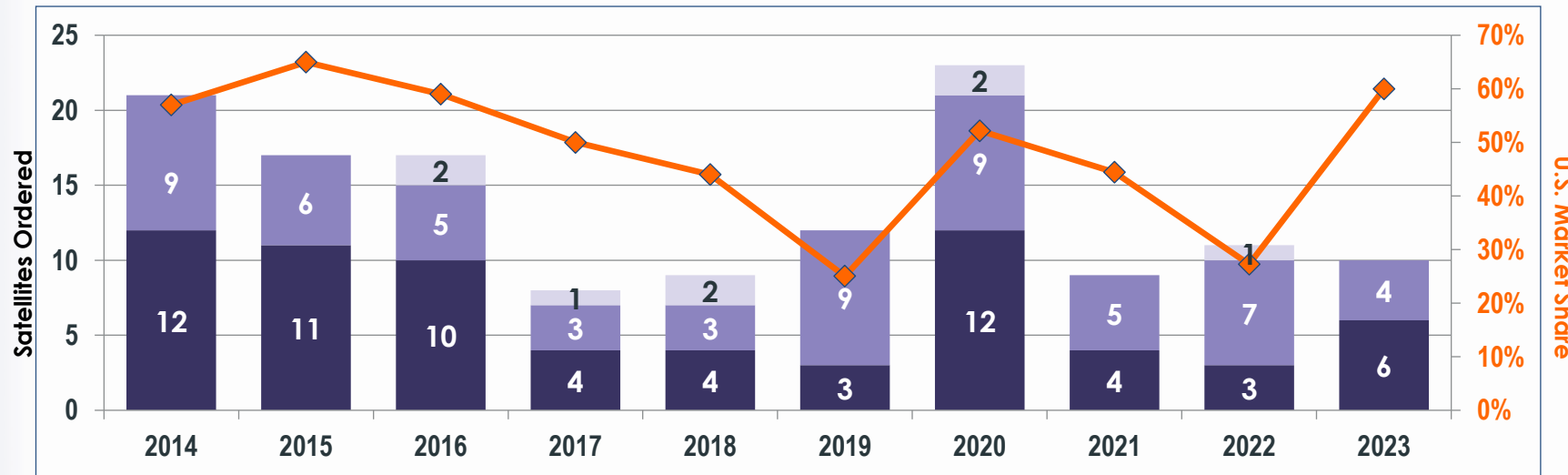




# Future Indicator: GEO Satellite Commercial Manufacturing Orders



- ✦ Commercial orders for 10 GEO satellites announced
- ✦ 6 orders won by U.S. manufacturers; 3 in 2022
- ✦ 4 orders won by European manufacturers; 7 in 2021
- ✦ GEO sat orders affect GEO launches, manufacturing revenue in subsequent years
- ✦ Large # of orders in 2020 driven by FCC C-band decisions (13 sats)



- U.S. GEO Orders
- Europe GEO Orders
- All Other GEO Orders
- U.S. Satellite Orders (%)

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# Satellite Services

- ✦ Consumer Services
  - Satellite Television
  - Satellite Radio
  - Satellite Broadband
- ✦ Enterprise Services
  - Transponder Agreements
  - Managed Network Services
  - Mobile Voice and Data
- ✦ Remote Sensing Services





## Massive telecom constellations of smallsats delivering service

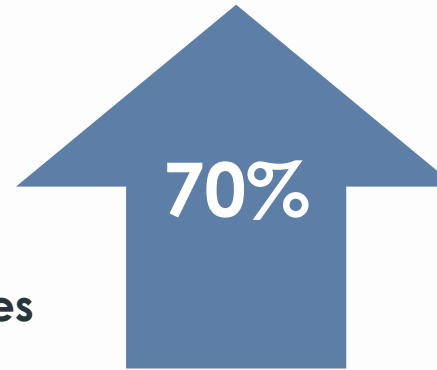
- ✘ Growing customer base and subscribers
- ✘ Working to prove business case viability
- ✘ Increasingly integrated into multi-orbit service offerings

## More, less expensive GEO satcom capacity on orbit enabling new services

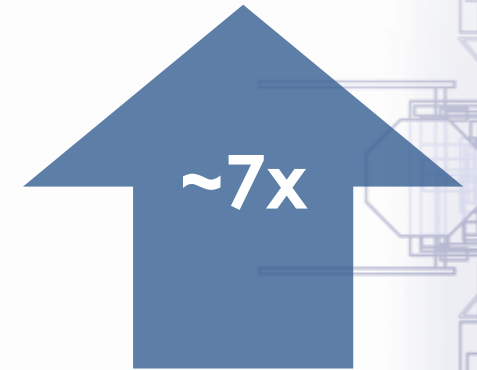
- ✘ 9x increase in total HTS capacity on orbit
- ✘ 80% decrease in cost of HTS capacity

## More new commercial remote sensing choices and capabilities

- ✘ ~7x times more remote sensing satellites on-orbit
- ✘ Increasing diversity of commercial imagery solutions across sensor types (multispectral, hyperspectral, SAR, RF mapping, RO, etc.)
- ✘ Increased fusion of data analytics with imagery, including through acquisition of geospatial analytics insight providers



**New Broadband  
Subscribers  
(2019 – 2023)**



**Commercial Remote  
Sensing Satellites on Orbit  
(2014 – 2023)**



# Satellite Services Overview



- ✦ Consumer satellite service revenues
  - Broadband grew 40%
  - Satellite radio decreased 1%
  - Satellite TV decreased 6%
- ✦ Enterprise service revenues
  - Mobile voice and data services grew 13%
  - Managed network services grew 5%
  - Transponder agreements decreased 1%
- ✦ Remote sensing service revenues grew 10%
- ✦ Trends
  - Markets for value-added satellite services grew across multiple segments, including broadband
  - LEO broadband systems generating consumer broadband revenue
  - New remote sensing companies contributing to growth
  - More mature DTH posted decline, with decrease in new subscribers



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# Satellite Services Findings: Consumer Services



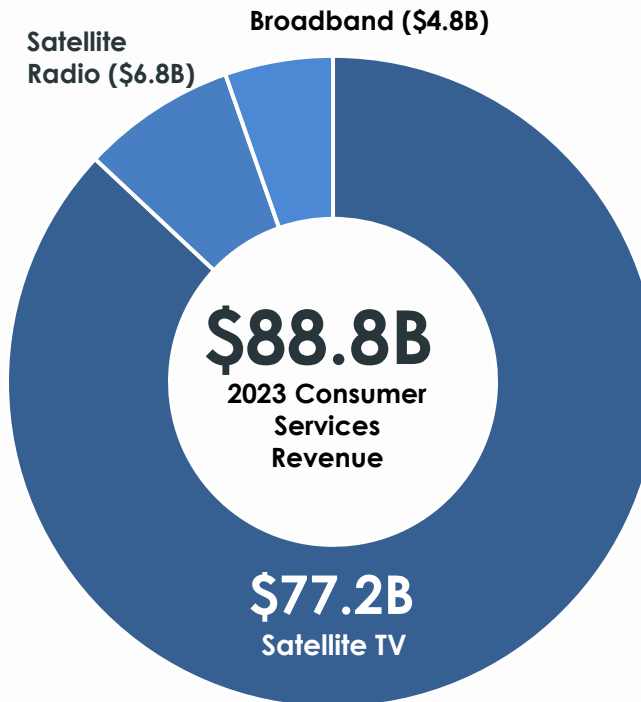
- ✘ Satellite radio declined 1%, driven by fewer automaker promotional subscriptions
- ✘ Broadband revenue and subscribers grew 40% and 27%, respectively. PLEO systems driving growth
- ✘ Decrease in satellite TV revenues; continuing trends in TV viewership, customer preferences

## Satellite Radio

- Revenues decreased 1%
- Subscribers decreased 1% to ~33.9M
- Mostly North American customer base

## Satellite End-User Broadband

- Revenue grew 40%
- Subscribers grew 27%, to over 4.4M
- Higher revenue per user in the U.S.
- Subscriber growth largely attributed to LEO systems as two new LEO constellations entered operations and are expanding customer base
- Dominated by U.S. providers, adding both U.S. and non-U.S. subscribers



## Satellite TV Services

- Satellite TV revenue (DBS/DTH) decreased 6%, driven by increased competition across media space, following wider pay-TV global trends
- Satellite TV accounted for 70% of all satellite services revenues, 87% of consumer revenues
- Global satellite TV subscriber base is estimated at around 200M commercial subscribers (plus a similar or slightly higher number of free-to-air satellite TV homes)
- U.S. revenues declining at higher rate compared to the rest of the world; lower per-user revenues outside U.S help slow down subscriber base reduction; subscriber trends vary by provider
- 33% of global revenues attributed to U.S. companies
- HD channels 30+ percent of all TV channels worldwide; 90%+ penetration in the U.S.
- Ultra-HD channels percentage of all TV channels worldwide in low single digits
- Contributing to slower demand for satellite capacity: constantly improving compression technologies; consumers opting for online streaming alternatives

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# Satellite Service Findings: Enterprise Services



- ✦ Mobile voice and data revenue increased 13%
  - Includes end-to-end mobile voice and data (including IoT) services over MSS frequency bands as defined by regulators
  - Growth driven by demand for commercial IoT and wholesale capacity services
- ✦ Managed network services revenue increased 5%
  - Includes fixed and mobility VSAT/private network services, maritime and in-flight broadband connectivity services over FSS bands
  - Increasing availability of HTS capacity and LEO capacity
- ✦ Transponder agreements revenue decreased 1%
  - Leasing transponder capacity to industry verticals including media & broadcasting, telecom, governments
  - Abundance of capacity, competition in transponder market offset by growth outside U.S. and Europe

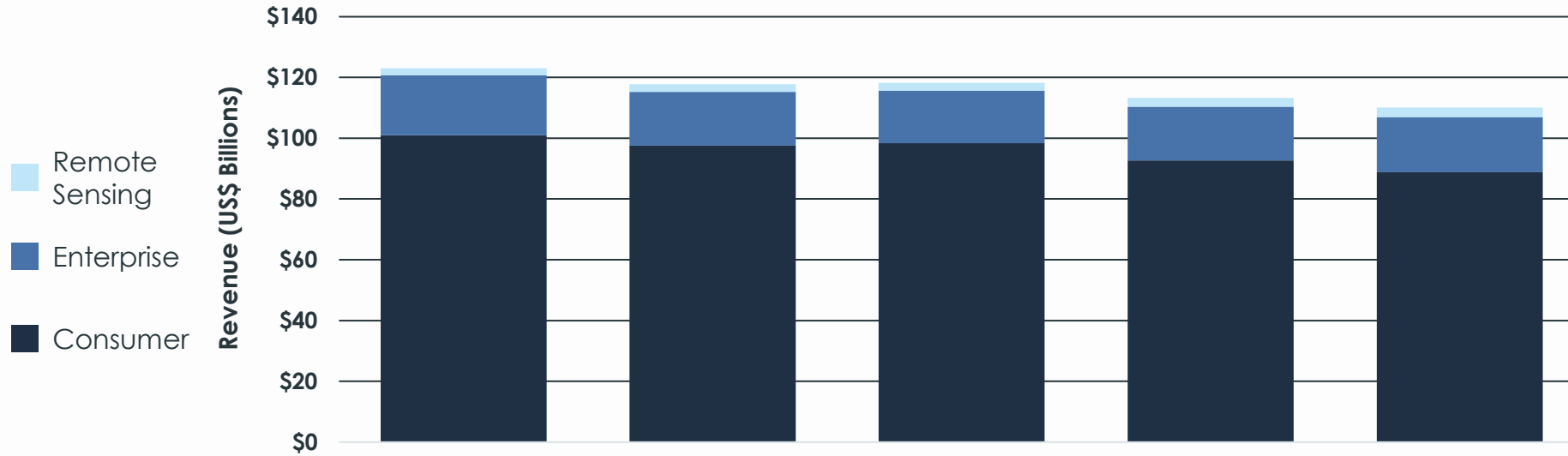
## Mobile voice and data vs. managed services

- ✦ Mobile voice and data
  - Uses MSS frequencies (L, S-band) as defined by regulators. Some M2M and IoT operators use VHF band
  - Provided to mobility and small-sized terminals, voice transceivers, and IoT devices
  - Voice, data, and IoT applications driving revenue growth, investment in direct to device market
- ✦ Managed services
  - Uses FSS frequencies (C, Ku, Ka-band) to primarily provide broadband connectivity
  - Provided to fixed and transportable/mobile VSATs, terminals on vehicles, vessels, and aircraft
  - Increased HTS capacity and new antenna technology has made service over FSS bands to mobility/on-the-move customers more attractive
- ✦ Fixed (FSS), mobile (MSS) satellite service defined by frequency, not by whether customer equipment is fixed or mobile





# Satellite Services: Global Revenue



The U.S. share of global satellite services revenue in 2023 was **40%**

	2019	2020	2021	2022	2023
<b>Growth Rate</b>	<b>-1.1%</b>	<b>-4.2%</b>	<b>0.4%</b>	<b>-4.2%</b>	<b>-2.7%</b>
<b>Total</b>	<b>\$123.0</b>	<b>\$117.8</b>	<b>\$118.3</b>	<b>\$113.3</b>	<b>\$110.2</b>
<b>Consumer</b>	<b>\$101</b>	<b>\$97.5</b>	<b>\$98.4</b>	<b>\$92.7</b>	<b>\$88.8</b>
Satellite TV (DBS/DTH)	\$92.0	\$88.4	\$88.9	\$82.4	\$77.2
Satellite Radio (DARS)	\$6.2	\$6.3	\$6.6	\$6.9	\$6.8
Satellite End-User Broadband	\$2.6	\$2.8	\$2.9	\$3.4	\$4.8
<b>Enterprise</b>	<b>\$19.7</b>	<b>\$17.7</b>	<b>\$17.2</b>	<b>\$17.7</b>	<b>\$18.2</b>
Transponder Agreements (1)	\$10.0	\$9.2	\$8.6	\$8.6	\$8.5
Managed Services over FSS Bands (2)	\$7.7	\$6.5	\$6.6	\$7.0	\$7.3
Mobile Voice and Data over MSS Bands (3)	\$2.0	\$2.0	\$2.0	\$2.1	\$2.4
<b>Remote Sensing</b>	<b>\$2.3</b>	<b>\$2.6</b>	<b>\$2.7</b>	<b>\$2.9</b>	<b>\$3.2</b>

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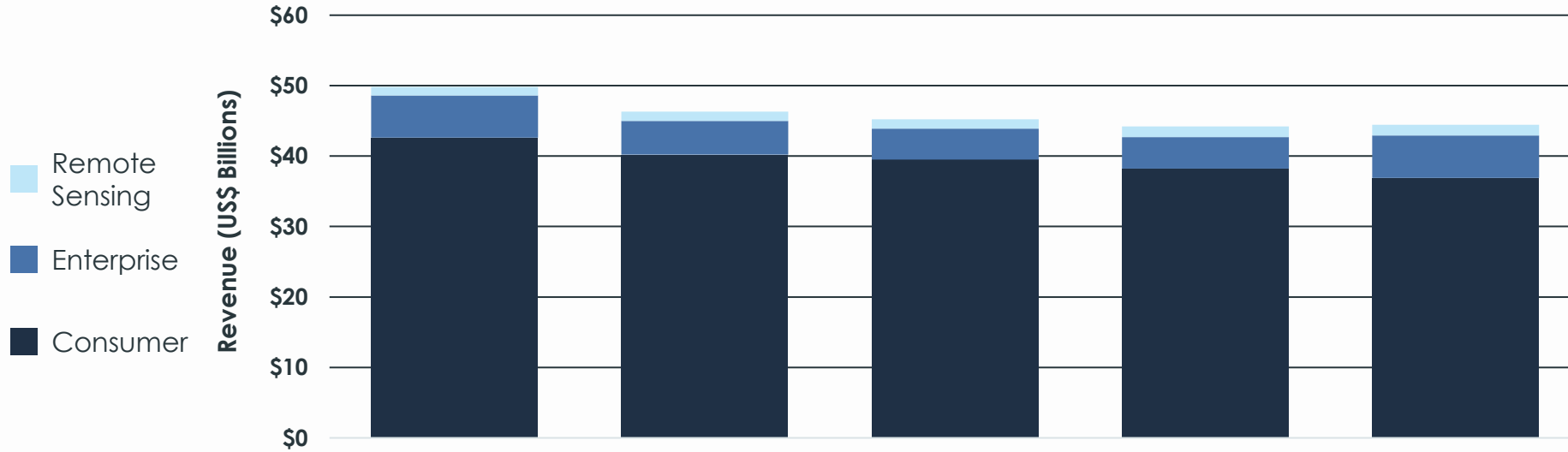


Notes: Numbers may not sum due to rounding. (1) Leasing transponder capacity to industry verticals including media & broadcasting, telecom, governments. (2) Includes fixed and mobility VSAT/private network services, maritime and in-flight broadband connectivity services over FSS bands. (3) Includes end-to-end mobile voice and data (including IoT) services over MSS frequency bands as defined by regulators





# Satellite Services: U.S. Revenue



The U.S. share of global satellite services revenue in 2023 was **40%**

	2019	2020	2021	2022	2023
<b>Growth Rate</b>	<b>-1%</b>	<b>-7%</b>	<b>-2%</b>	<b>-2%</b>	<b>0.6%</b>
<b>Total</b>	<b>\$49.7</b>	<b>\$46.3</b>	<b>\$45.2</b>	<b>\$44.2</b>	<b>\$44.5</b>
<b>Consumer</b>	\$42.8	\$40.2	\$39.5	\$38.2	\$36.9
Satellite TV (DBS/DTH)	\$34.0	\$31.4	\$30.1	\$28.4	\$25.7
Satellite Radio (DARS)	\$6.2	\$6.3	\$6.6	\$6.9	\$6.8
Satellite End-User Broadband	\$2.4	\$2.5	\$2.8	\$2.9	\$4.4
<b>Enterprise</b>	\$6.0	\$4.8	\$4.4	\$4.5	\$6.1
Transponder Agreements (1)	\$0.2	\$0.0	\$0	\$0	\$0
Managed Services over FSS Bands (2)	\$5.1	\$4.1	\$3.6	\$3.6	\$3.8
Mobile Voice and Data over MSS Bands (3)	\$0.7	\$0.7	\$0.8	\$0.9	\$2.3
<b>Remote Sensing</b>	\$1.2	\$1.3	\$1.3	\$1.5	\$1.5

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Notes: Numbers may not sum due to rounding. (1) Leasing transponder capacity to industry verticals including media & broadcasting, telecom, governments. (2) Includes fixed and mobility VSAT/private network services, maritime and in-flight broadband connectivity services over FSS bands. (3) Includes end-to-end mobile voice and data (including IoT) services over MSS frequency bands as defined by regulators



# Special Topic: Direct-to-Device Connectivity

## Satellite Operators Seeking to Grow an Emerging Satellite Services Market



- ✘ Strong market interest in connecting satellites directly to mobile phones and other devices
  - Consumer services including SOS emergency messaging, text
  - Eventually roaming voice and 5G data coverage
- ✘ 10+ satellite operators developing/deploying systems
  - Two providing limited initial services, including SOS messaging to specialized devices or specific geographies
  - Additional four have deployed satellites, for testing/demo
- ✘ Companies are pursuing a range of approaches
  - Space segment
    - Leveraging existing satellite networks
    - Deploying new constellations tailored for direct-to-device service
  - Spectrum
    - Use already authorized satellite spectrum
    - Add spectrum to satellites in partnership with terrestrial operators
  - Device implementation
    - Modify or develop new devices to utilize satellite frequencies
    - Modify sats to utilize standard devices



### Key market drivers

Escalating from basic to more advanced services (e.g., text to voice calls, sending media, video streaming)

Customer willingness to pay and market penetration

Mobile broadband company appetite

Spectrum allocation, potential interference with terrestrial networks

Integration of satellite signals into wireless standards

Wide-spread adoption of specialized hardware, including compatible chipsets

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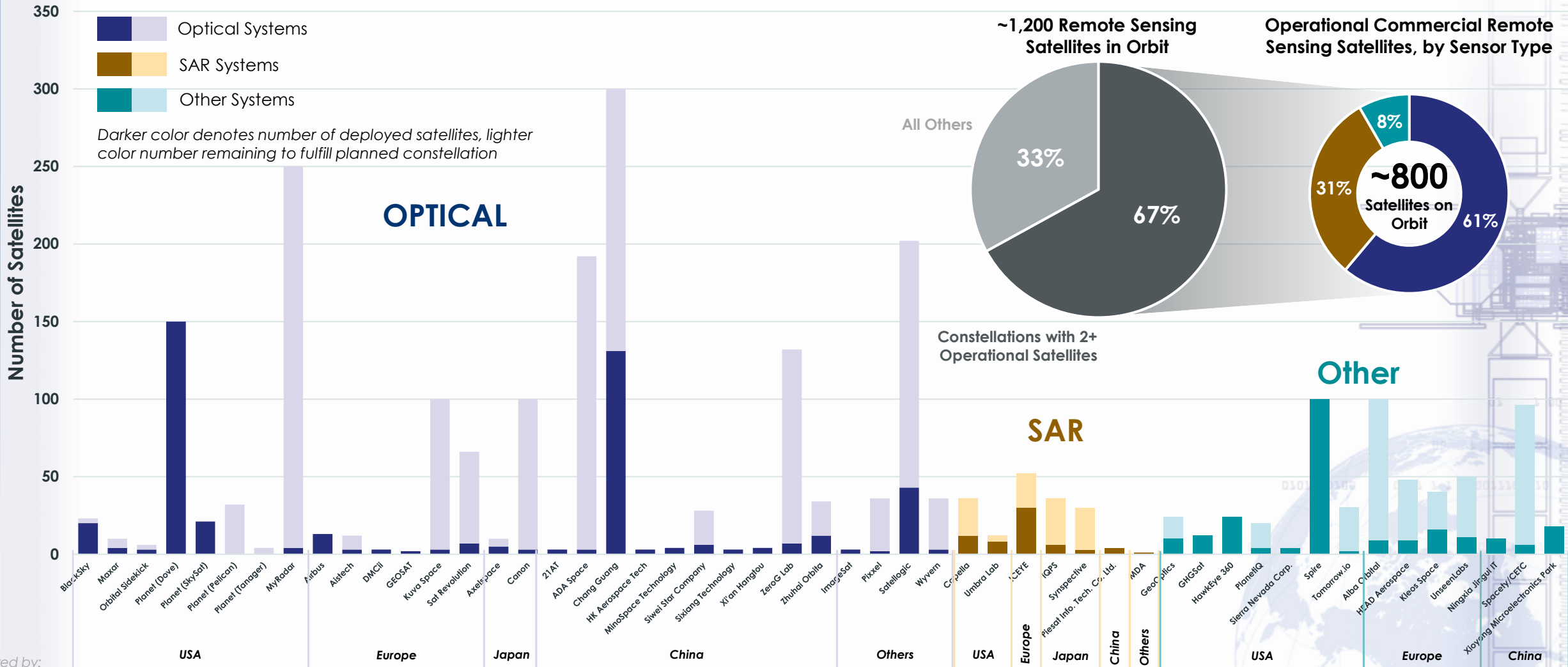




# Case Study: Remote Sensing Services



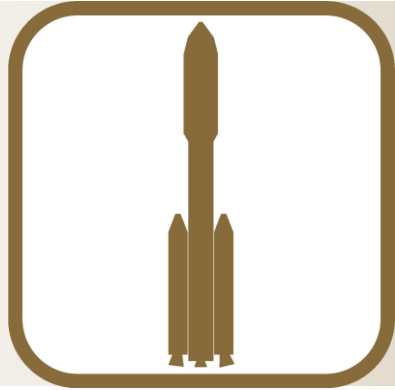
Systems with at least two operational satellites, by relative size of constellation, percentage of satellites on orbit, and sensor type



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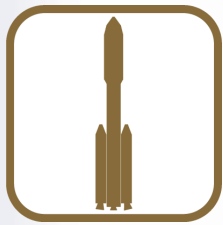
Others: Argentina, Canada, India, Israel



# Launch

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# Launch

## Changing Industry Dynamics

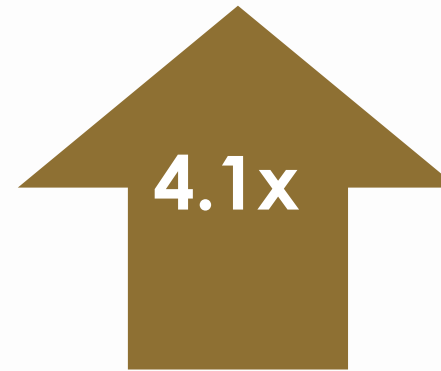


### Increased launch activity

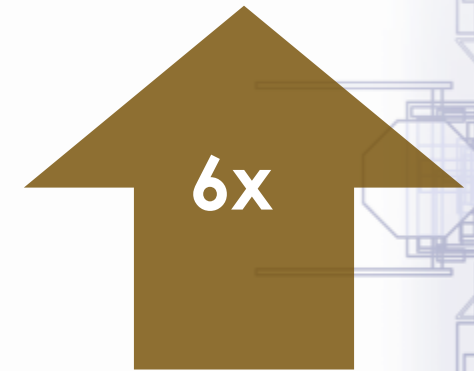
- ✘ Record number of orbital launches (221 in 2023, 19% increase from 2022, ~2.4x increase from 2014)
- ✘ More satellite upmass launched per year (4.1x from 2014)
- ✘ More satellites launched per year, driven by smallsats (+10x more sats launched in 2023 vs 2014)
- ✘ Increased rideshare opportunities
- ✘ ~1.1x increase in launches of small launch vehicles since 2014 (predominately by China and U.S. providers)

### Changing launch landscape

- ✘ Initial launches of next-generation medium-to-heavy vehicles. Other vehicles expected to conduct initial launches soon
- ✘ Launch vehicle delays and time to required ramp operations affecting competitive landscape
- ✘ Some small launch providers now developing higher capacity vehicles

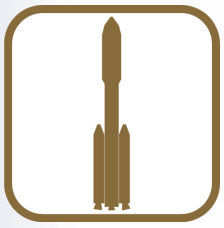


**Uppmass  
(2014 – 2023)**

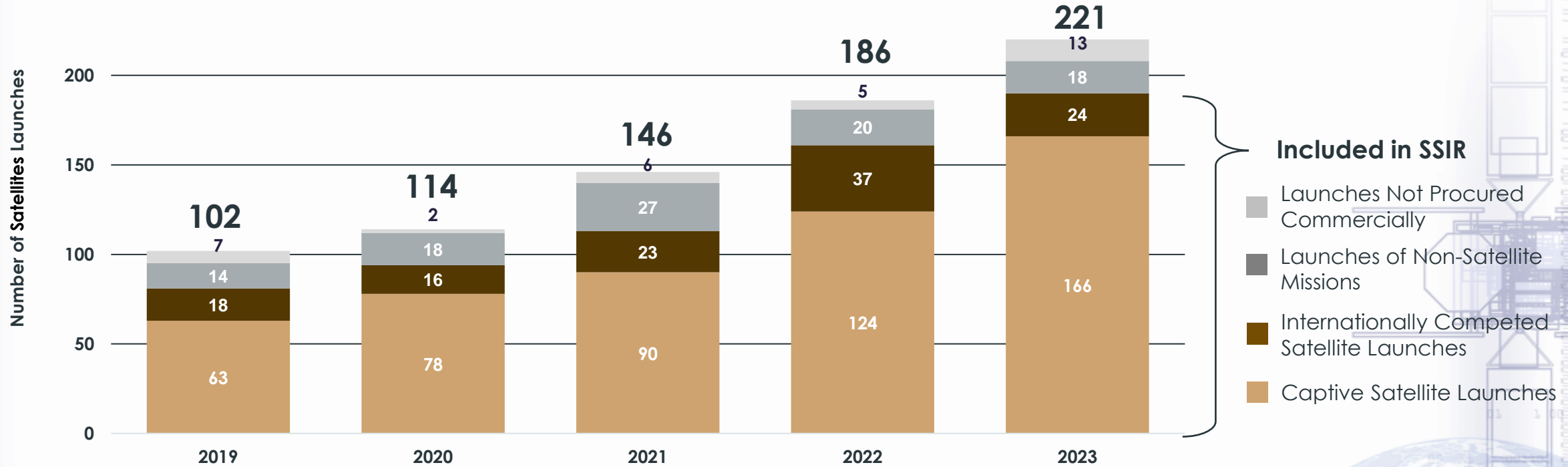


**Launches by U.S.  
operators  
(2014 – 2023)**





# Satellite Launch: Methodology

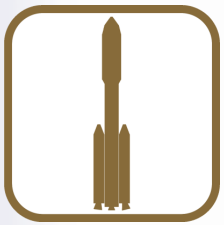


## ✘ Included in SSIR: commercially-procured satellite launches

- Internationally-competed launches of satellites
- Captive satellite launches procured from launch providers on contractual basis or privately-funded launches. Revenues include estimates for self-provided commercial launches

## ✘ Not included in SSIR

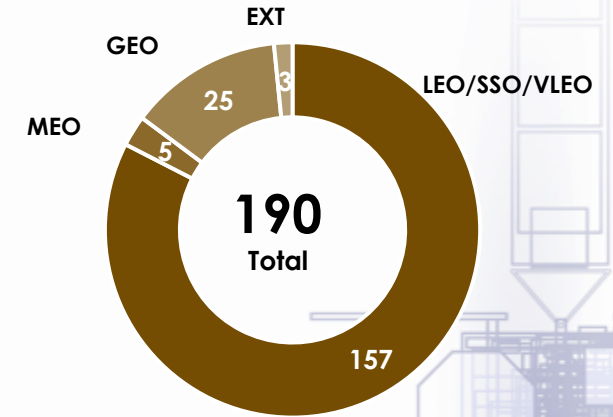
- Launches of non-satellite missions (crew and cargo to ISS, other space vehicles)
- Launches not procured commercially – a government agency providing a launch of a satellite owned by the same agency (e.g., ISRO)



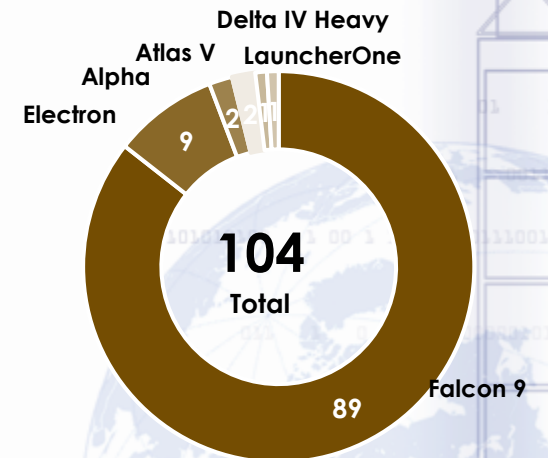
# Launch: Industry Findings and U.S. Highlights



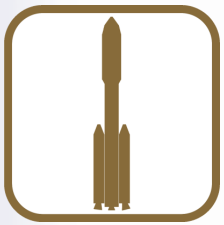
- ✦ \$7.2B revenues from commercially-procured satellite launches worldwide; 2% increase from 2022 (\$7.0B)
- ✦ At 190, an increase of 18% in commercially-procured launches from 2022 (161)
  - Continued commercial LEO broadband constellation launches in 2023
  - Including all payloads (non-satellite missions), 221 launches – the most ever
- ✦ U.S. captured 54% of commercially-procured launch revenues
  - Competitive U.S. commercial launch prices
  - Increasing number of providers
  - 104 launches by U.S. providers (78 in 2022), 64 SpaceX Starlink launches
- ✦ Continuing trends
  - Government customers worldwide remained the revenue driver (52%, similar to 52% in 2022)
  - Launches of U.S. government satellites generated 12% of all launch revenue
  - No Russian internationally-competed launches in 2023 (zero in 2022, one in 2021) and low level of European launches (3 in 2023) due to transition to Ariane 6, loss of the Soyuz, and delays associated with Vega anomalies



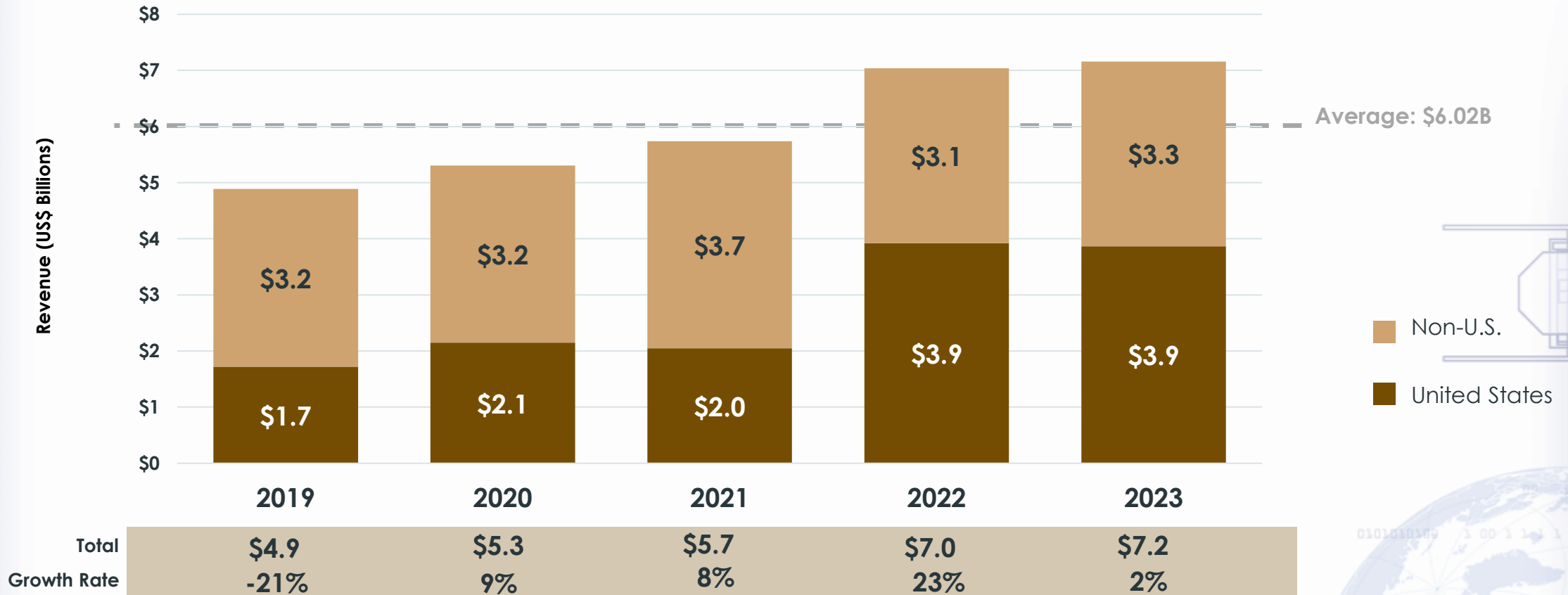
2023 Commercially Procured Satellite Launches by Orbit



2023 Commercially Procured U.S. Satellite Launches by Vehicle



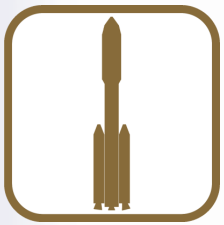
# Launch Industry Revenues



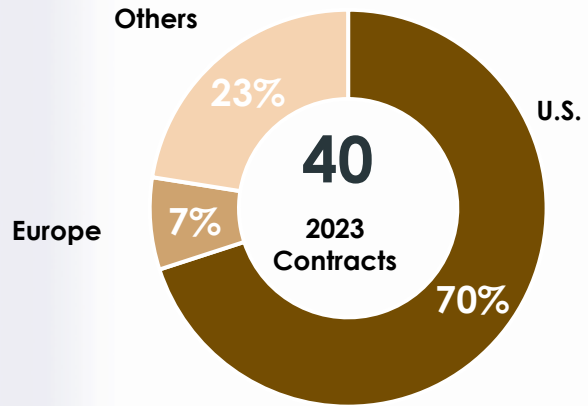
- ✘ \$7.2B global revenues in 2023 from commercially procured satellite launches
- ✘ U.S. share of global launch revenues in 2023 was 54% (56% in 2022)

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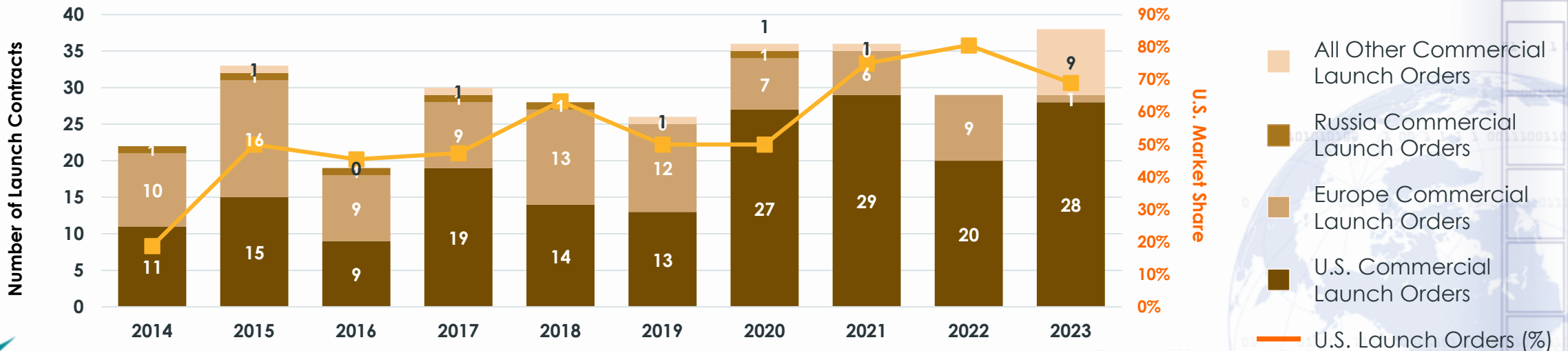




# Future Indicator: Commercial Satellite Launch Contracts



- ✦ 40 competed orbital launch contracts announced in 2023 (29 in 2022)
  - U.S. providers awarded 28 contracts for a total of 104 launches, plus options
    - U.S. medium/large launch providers captured 11 contracts, 55 launches, plus options
    - U.S. small launch providers captured 17 contracts, 48 launches
  - European providers captured 3 contracts for a total of 4 launches
- ✦ Many additional contracts announced for small satellite rideshare
- ✦ Excludes Starlink launches on Falcon 9



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# Space Sustainability Activities

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# Space Sustainability Activities: Methodology



To report on new space sustainability activities beginning to generate commercial revenue, the SSIR now includes a section covering 'space sustainability activities'



## Mission Life Extension

- ✦ Using an external vehicle to take on station keeping and attitude control functions
- ✦ Refueling to extend satellite mission life



## Active Debris Removal

- ✦ Atmospheric deorbiting
- ✦ Removal of satellites, debris



## Satellite Servicing

- ✦ Manipulating, repairing, or adding components to restore or enhance a satellite's capabilities (excluding refueling propulsion)
- ✦ Includes satellite inspection services



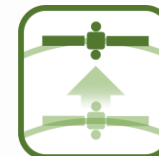
## Space Situational Awareness

- ✦ Services providing SSA information
- ✦ Reflects revenues to operators of SSA data collection networks (terrestrial or space based); does not include those not operating sensors



## Manufacturing and Assembly

- ✦ Assembly of satellites on orbit, whether components are manufactured on Earth or in space
- ✦ Manufacturing of satellite components in space



## Moving Satellites

- ✦ Repositioning operational satellites from one location to another using a dedicated spacecraft, orbital transfer vehicle (OTV)
- ✦ Includes moving satellites to graveyard orbits

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Revenues from terrestrial manufacturing of spacecraft performing space sustainability activities included in satellite manufacturing. Non-satellite revenue not included (e.g., platform-based manufacturing of biological products or human-tended platform operations)



# Space Sustainability Activities

## Emerging Industry Dynamics



### Diverse, growing group of companies

- ✦ Globally, companies range from early-stage to established
- ✦ Some space sustainability activities are generating revenue: space situational awareness, satellites transportation, mission life extension
- ✦ Multiple planned demonstration missions for new on orbit capabilities

### Space situational awareness represents largest segment

- ✦ About three-quarters of global revenues
- ✦ Driven by companies with ground-based systems providing data to growing number of satellite operators and governments

### Other markets continue to develop

- ✦ Greater numbers of orbital transfer vehicles (OTVs) for satellite deployments
- ✦ Multiple providers have successfully moved dozens of primarily non-propulsive CubeSats in recent years; new capabilities planned
- ✦ Life extension, satellite servicing, active debris removal, manufacturing and assembly missions also planned in near-term



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# Ground Equipment

- ✦ Network Equipment
  - Gateways
  - Control stations
  - Very small aperture terminals (VSATs)
- ✦ Consumer Equipment
  - Satellite TV dishes
  - Satellite radio equipment
  - Satellite broadband dishes
  - Satellite phones and mobile satellite terminals
- ✦ Satellite navigation stand-alone hardware



# Ground Equipment

## Changing Industry Dynamics



### 5.6 billion GNSS satellite-enabled smartphones, other devices in use

- ✘ Millions of unique location-based services, apps
- ✘ Mass-produced chipsets resulting in lower costs

### Broadband, satellite radio installations on the rise

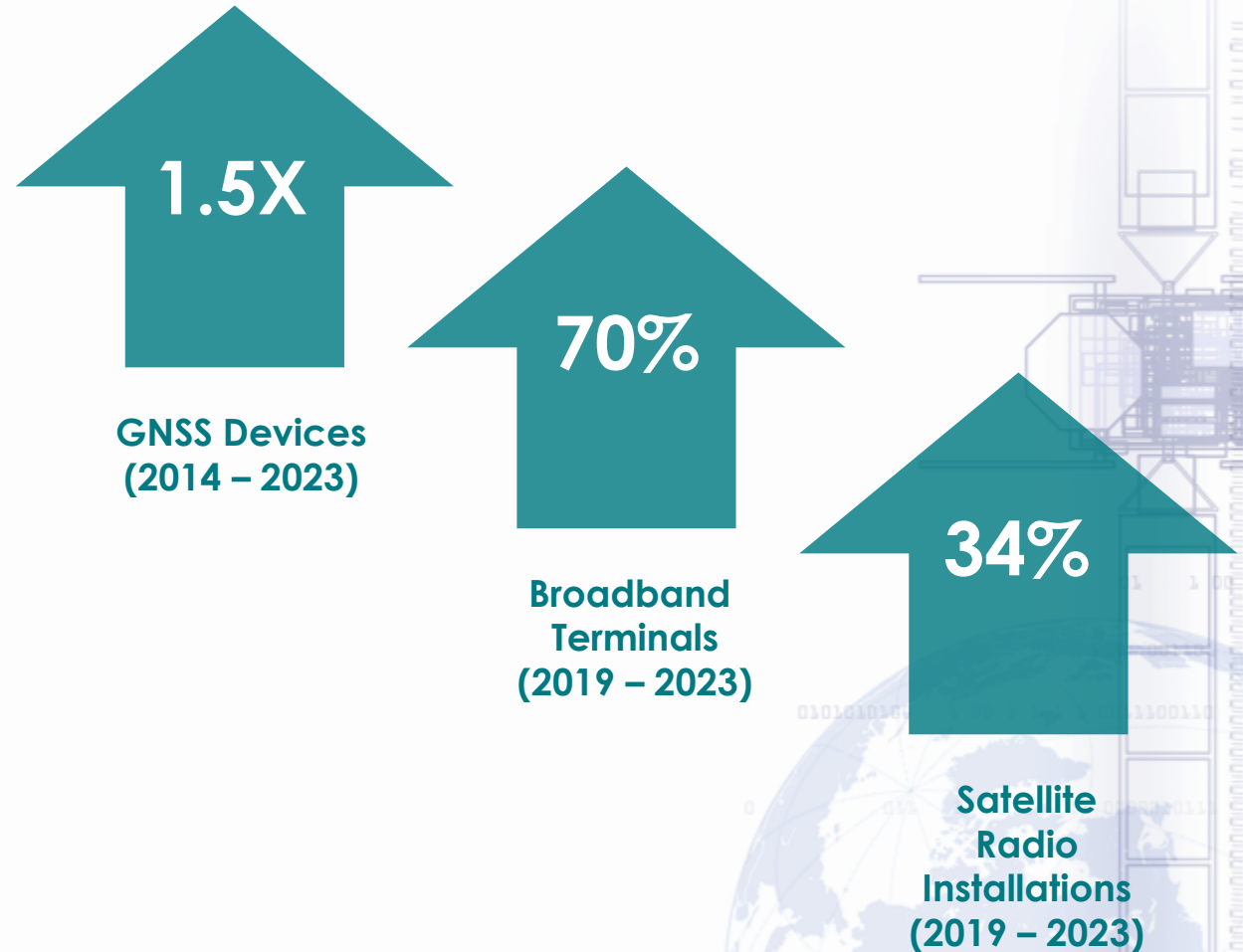
- ✘ Broadband terminals up 70% over 5 years
- ✘ Installed satellite radios up 34% over 5 years

### Television viewership changing from traditional models

### Demand for multi-orbit compatible terminals

### Growing on-the-move connectivity

### Sat to cellphone capabilities deploying



Notes: Previously reported GNSS satellite-enabled smartphones and other devices in adjusted to reflect updated GNSS estimate from European Union Agency for the Space Programme

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# Ground Equipment Findings



- ✦ Total satellite ground equipment revenues increased 4% in 2023
- ✦ Satellite navigation (global navigation satellite systems, GNSS) revenues increased 3%
  - Includes equipment (including software updates), excludes downstream applications
    - Stand-alone and in-vehicle units
    - Components (mainly chipsets) directly enabling location-based capabilities in mobile devices, traffic information systems, aircraft avionics, and in maritime, surveying, rail, and other equipment
  - Increase in sales of in-vehicle and fleet management systems with GNSS components
- ✦ Network equipment revenues increased 10%
- ✦ Revenue from consumer equipment increased 2%, with growth in broadband partially offset by satellite TV receiver revenues decreasing in most markets

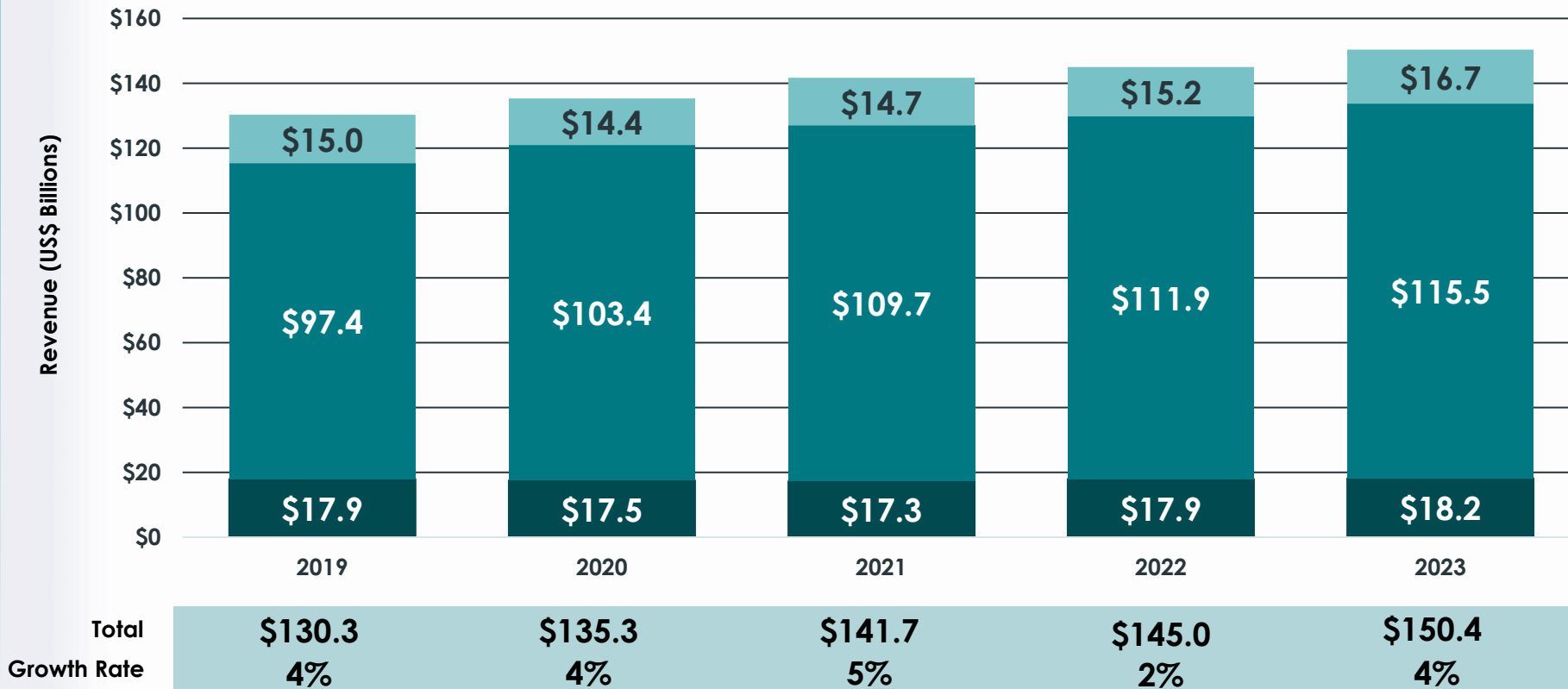
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# Global Satellite Ground Equipment Revenues



The U.S. share of ground equipment revenue in 2023 was **32%**

- Network Equipment
- GNSS Equipment
- Consumer Equipment  
Satellite TV, Radio, Broadband, and mobile (Non-GNSS)

*Network Equipment — gateways, network operations centers (NOCs), satellite news gathering (SNG) equipment, flyaway antennas, very small aperture terminal (VSAT) equipment.*  
*Consumer Equipment — non-GNSS: satellite TV, radio, and broadband equipment, mobile satellite terminals.*  
*GNSS — includes 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.*  
*Estimates based on GSA GNSS Market Reports; EUSPA EO and GNSS Market Report 2022; EUSPA EO and GNSS Market Report 2024; other data.*

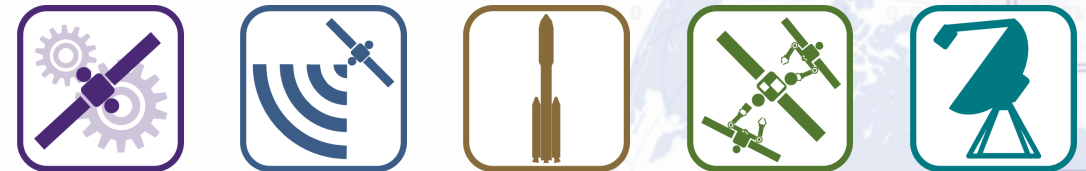
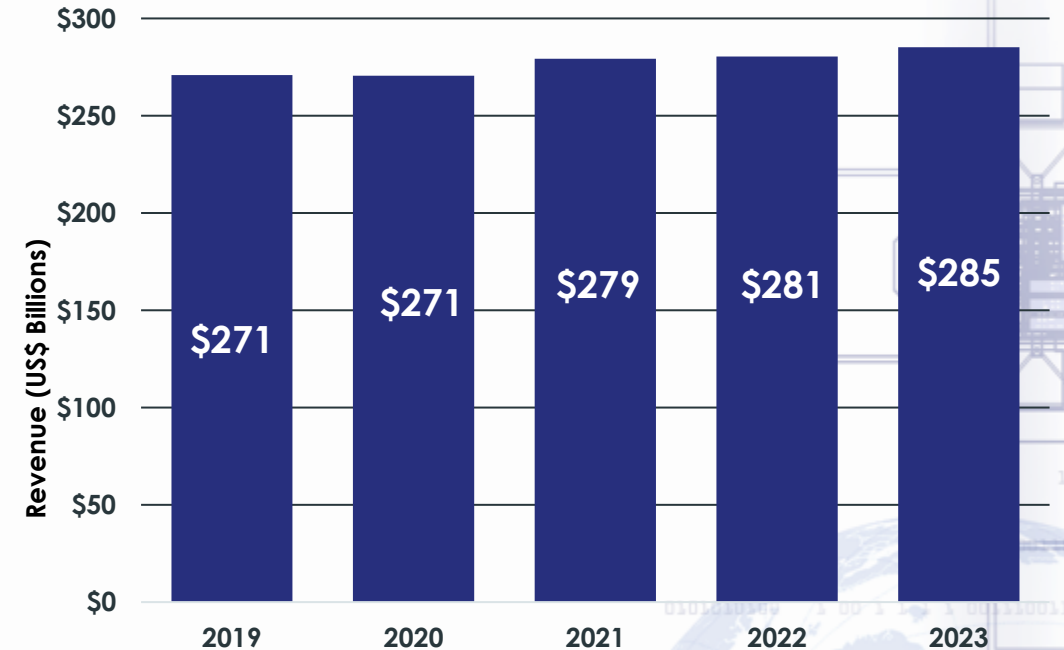
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# Summary: Top-Level Global Satellite Industry Findings

- ✦ Record satellite deployments and launches
  - 2,781 commercially procured spacecraft launched in 2023 (vs 2,325 in 2022)
  - 190 commercially procured launches (vs 161 in 2022)
- ✦ Satellite industry driving increased affordability and productivity, new capabilities
  - Large broadband systems deploying, operational across multiple companies (2,116 sats launched 2023)
  - Growth in GEO HTS capacity, lower overall cost per Gbps
  - Emerging space sustainability activities generating revenue
  - Growth in remote sensing revenue, new capacity (SAR, hyperspectral)
- ✦ Growth across most segments
  - Manufacturing +9%
  - Satellite services -2.7%
  - Launch +2%
  - Ground equipment +4%

### 2023 Satellite Industry Revenue \$285B





The voice of the  
satellite industry

For more information on the satellite industry,  
or for previous SSIR reports, please contact SIA:

**Satellite Industry Association**

info@sia.org  
202-503-1560  
[www.sia.org](http://www.sia.org)



info@brycetek.com  
703-647-8078  
brycetek.com

# 2023 Global Satellite Industry Revenues

## The Satellite Industry in Context

(2023 revenues worldwide in billions of U.S. dollars)

### Non-Satellite Industry

- Government space budgets
- Commercial human spaceflight

**\$300M+**  
Space Sustainability Activities

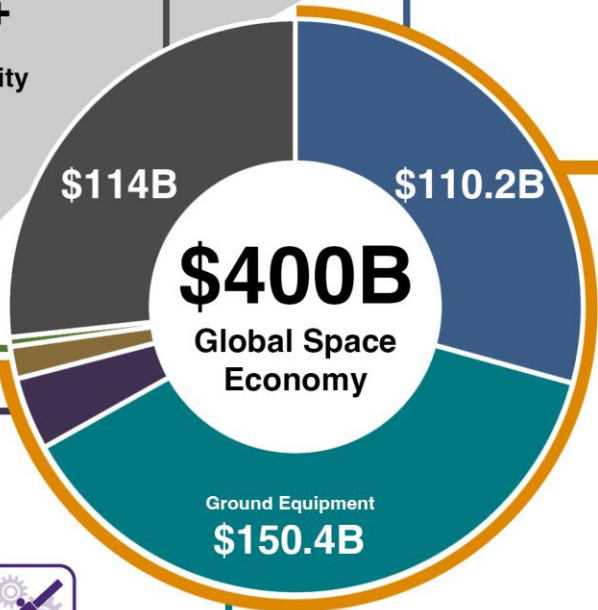


### Satellite Services



- Telecommunications
- Remote Sensing

**\$285B**  
Satellite Industry  
71% of Space Economy



**\$7.2B**  
Launch



**\$17.2B**  
Satellite Manufacturing

### Ground Equipment



- Network Equipment
- Consumer Equipment



### Satellite Services

**2023 Revenues: \$110.2B**



**Consumer \$88.8B**

- Satellite TV (DBS/DTH)
- Satellite Radio (DARS)
- Satellite End-User Broadband

**Enterprise \$18.2B**

- Transponder Agreements
- Managed Services Over FSS Bands
- Mobile Voice and Data Over MSS Bands

**Remote Sensing \$3.2B**



### Ground Equipment

**2023 Revenues: \$150.4B**



**\$115.5B**  
GNSS Equipment  
(GNSS devices/chipsets)

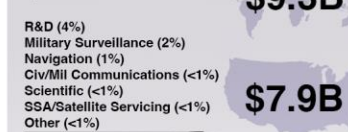


**\$16.7B**  
Network Equipment  
(VSATs, gateways, etc.)



### Satellite Manufacturing

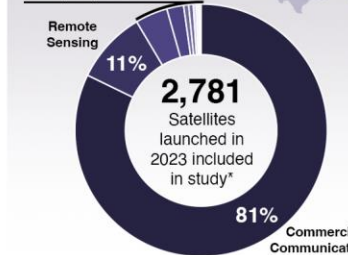
**2023 Revenues: \$17.2B**



**\$9.3B**

**\$7.9B**

- R&D (4%)
- Military Surveillance (2%)
- Navigation (1%)
- Civ/Mil Communications (<1%)
- Scientific (<1%)
- SSA/Satellite Servicing (<1%)
- Other (<1%)

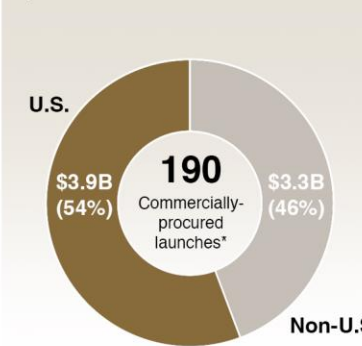


**2,781** Satellites launched in 2023 included in study\*



### Launch Industry

**2023 Revenues: \$7.2B**



\* 190 commercially procured launches from 221 total orbital.

**Commercial Launch Revenues by Region**

## Changing Industry Dynamics: Increasing Affordability and Productivity, New Capabilities

Improved capability, innovative application of smallsats  
New applications, new models  
More capable, lower cost GEO satellites

**Satellite Manufacturing**

Increased launch activity  
Changing launch landscape

**Launch**

Massive telecom constellations of smallsats delivering service  
More GEO satcom capacity enabling new services  
More commercial remote sensing choices, capabilities

**Satellite Services**

Debris removal  
Moving satellites  
Life extension  
SSA  
Servicing  
In-orbit assembly

**Space Sustainability Activities**

New satellite activities contributing to in-orbit sustainability

Growing on-the-move connectivity  
5.6B GNSS satellite-enabled smartphones, other devices  
Broadband, satellite radio installations on the rise  
Sat to cellphone capability deploying  
Television viewership changing from traditional models

**Ground Segment**

- Changing industry dynamics provide increased end user benefits
- Increasing productivity
  - Increasing affordability
  - New capabilities
  - New space sustainability concepts
  - Greater resiliency
  - Economic growth

**End Users**

Consumer, industry, government, and non-profits  
All sectors of the economy  
Global

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