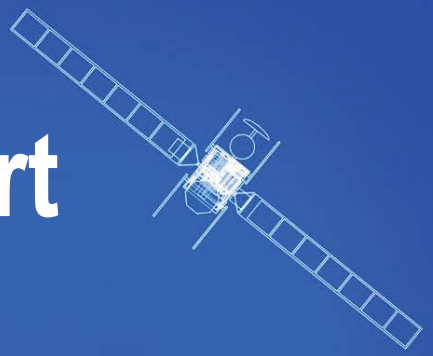
State of the Satellite Industry Report



Prepared by:

THE TAURI GROUP

September 2014

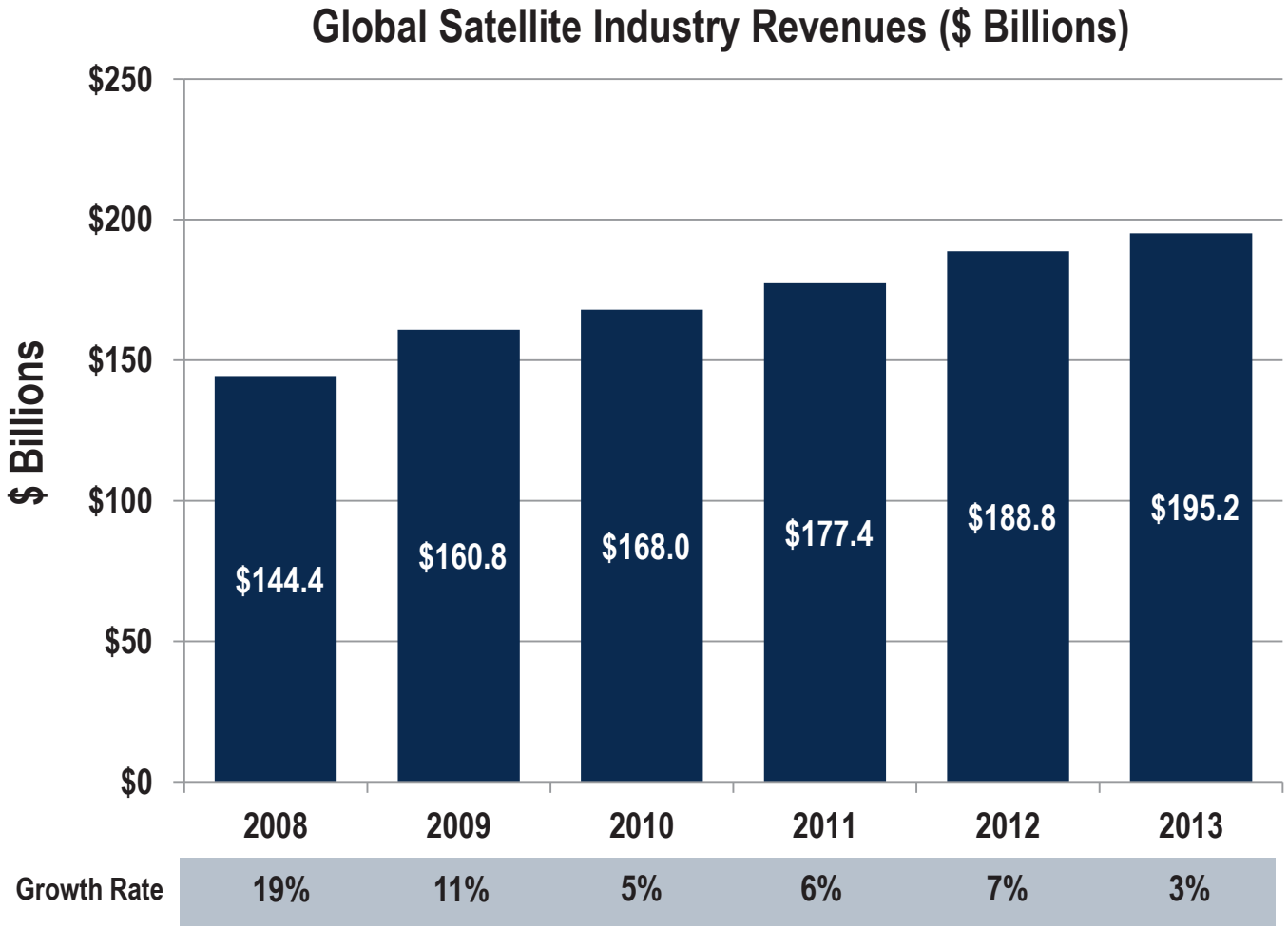
Satellite Industry Association:
19 Years as the Voice of the U.S. Satellite Industry

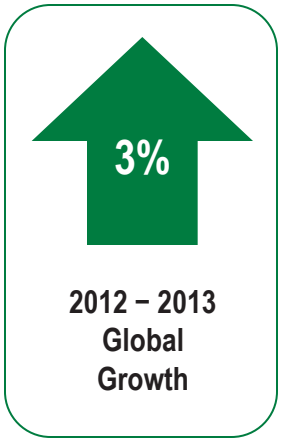
SIA Member Companies

Study Overview

- SIA's 17th annual study of satellite industry data
- Performed by The Tauri Group
- Reports 2013 data derived from surveys, other public information, and independent analysis
- All data are global, unless otherwise noted
- Prior year revenues are not adjusted for inflation

Global Satellite Industry Revenues





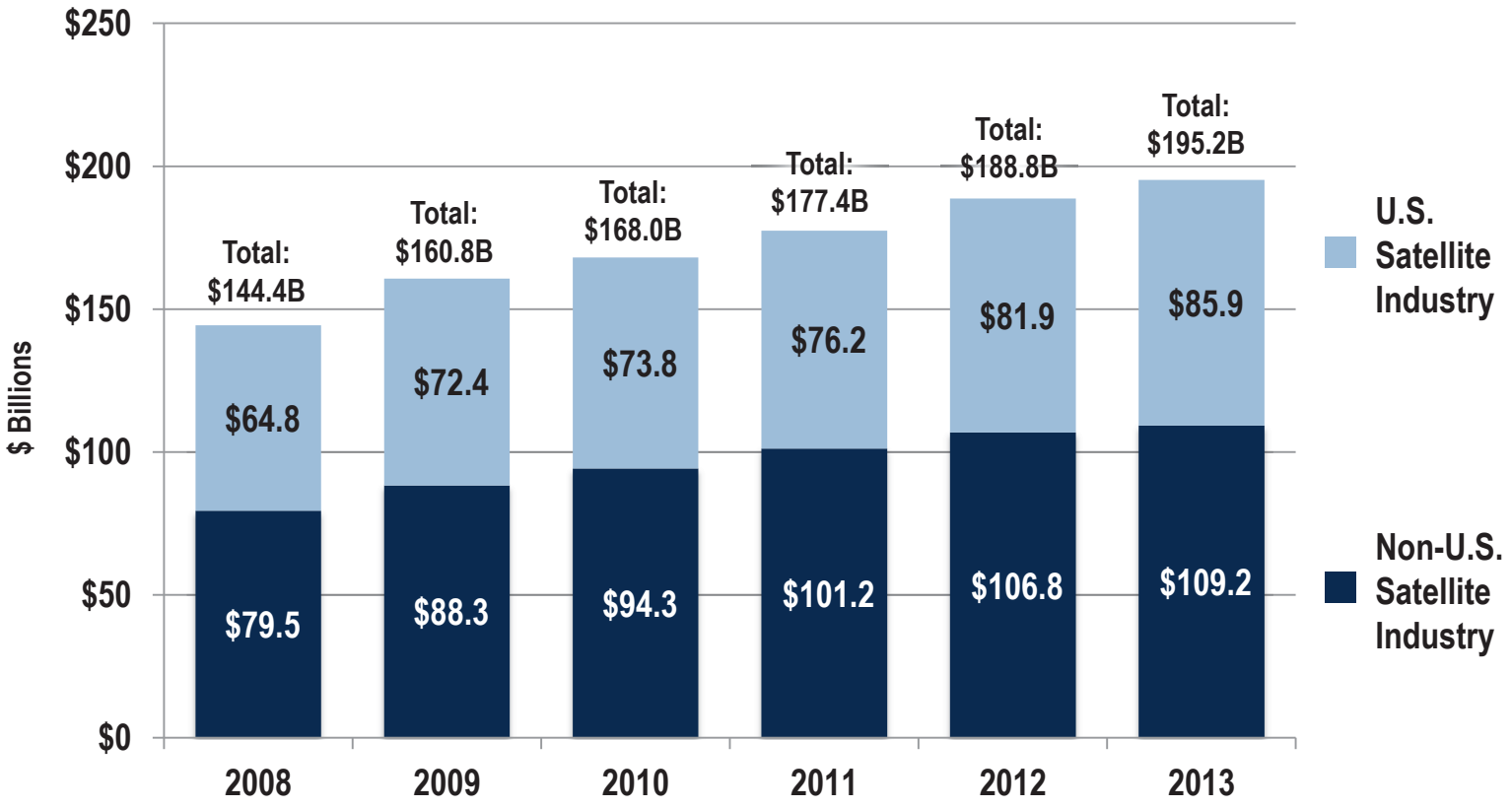
Global satellite industry grew 3% in 2013, slightly outpacing both worldwide economic growth (2.4%) and U.S. growth (2.8%)

U.S. Portion of Global Satellite Industry Revenues

Average yearly U.S. market share

44%

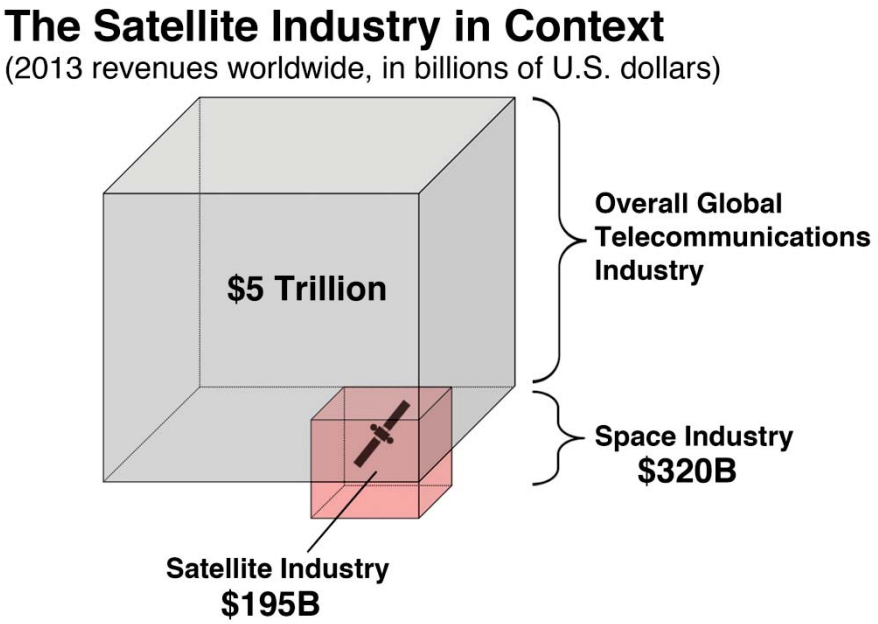
of global industry



	2008	2009	2010	2011	2012	2013
Growth Rate	19%	11%	4%	6%	6%	3%
U.S. Growth	26%	12%	2%	3%	7%	5%
Non-U.S. Growth	13%	11%	7%	7%	6%	2%

The Satellite Industry in Context

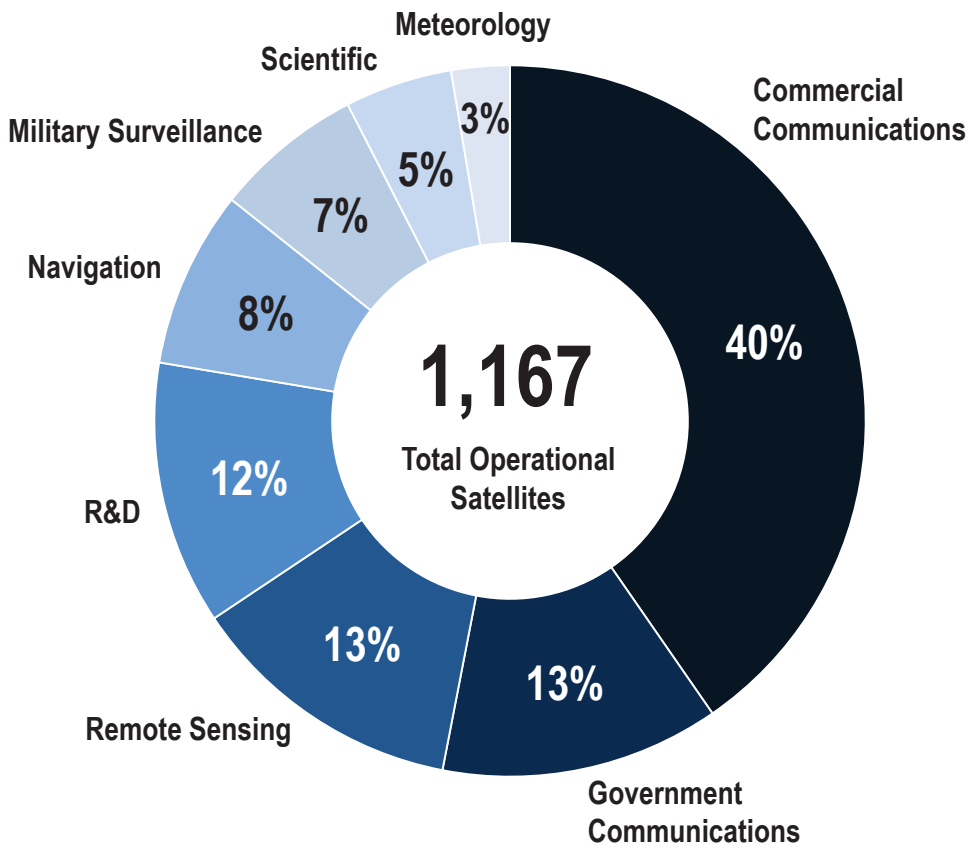
- The satellite industry is a subset of the telecommunications and space industries, representing:
  - » 60% of global space revenues
  - » 4% of global telecommunications revenues
- Non-satellite industry space revenues = human spaceflight, non-orbital spacecraft, government spending
- Satellite industry growth tracks with telecommunications and space industries' growth
  - » Telecommunications revenue up 7%
  - » Space revenue up 5%
  - » Satellite industry up 3%



Sources: "TIA 2014 Playbook," Telecommunications Industry Association; "GNSS Market Report (October 2013)," European GNSS Agency; Commercial Spaceflight Federation; Missile Defense Agency, NASA, and Space News

The Satellite Network in Context

Operational Satellites by Function
(as of 2013)



- Nearly 1,200 operating satellites as of year-end 2013
  - » >50% are communications satellites
  - » 40% are commercial communications satellites
- 50+ countries operate at least one satellite (some as part of regional consortia)

Source: The Tauri Group database of spacecraft and launch activities and Union of Concerned Scientists

Top-Level Global Satellite Industry Findings

- Satellite industry revenue was $195.2 billion in 2013
- Overall industry growth of 3% worldwide
- Three of the four satellite industry segments surveyed posted growth

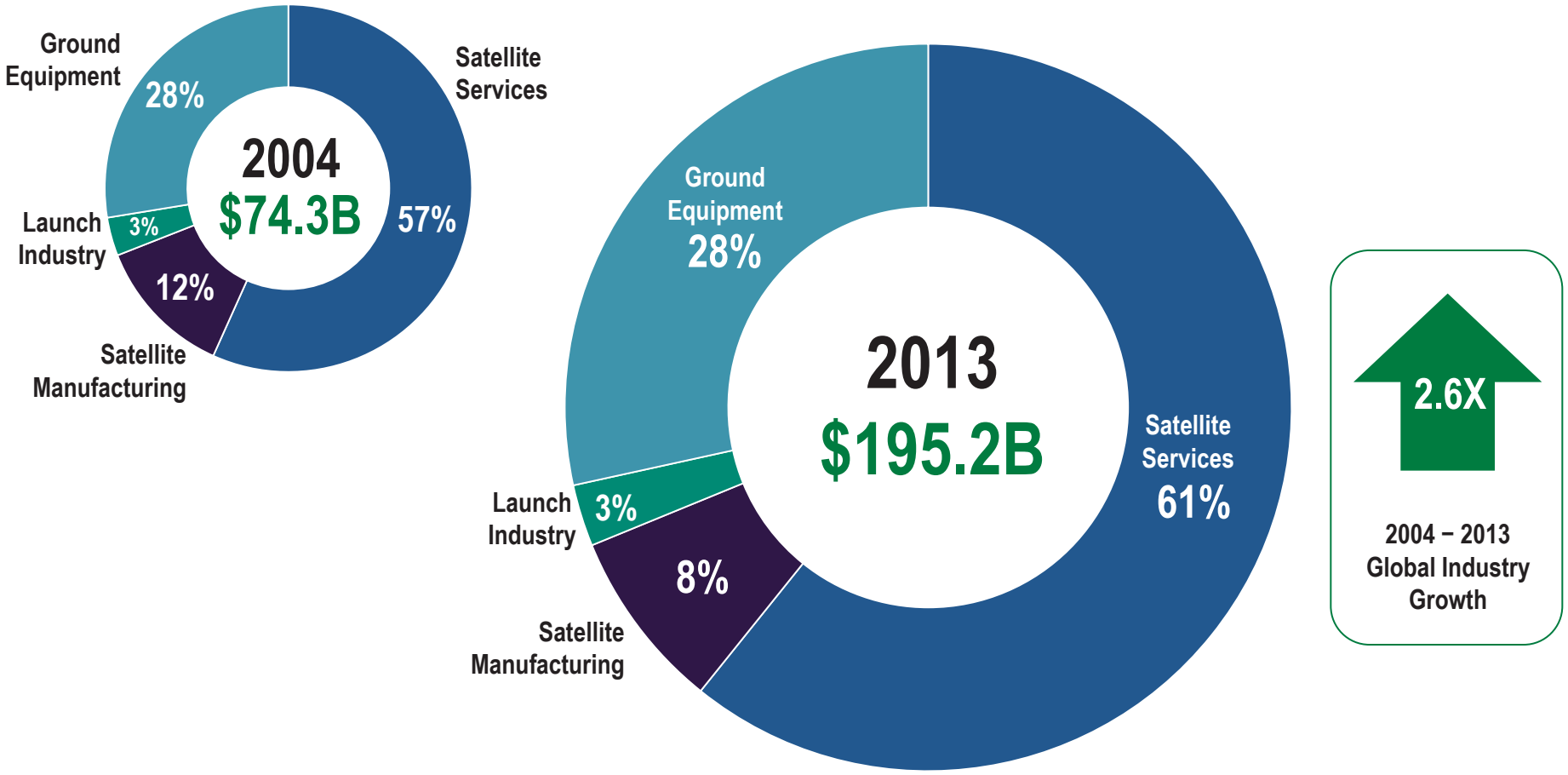
Satellite services, the largest segment, grew by 5%

Satellite manufacturing revenues grew by 8%

Launch industry revenues decreased by 7%

Ground equipment revenues grew by 1%

World Satellite Industry Revenues By Segment: Long-Term Review



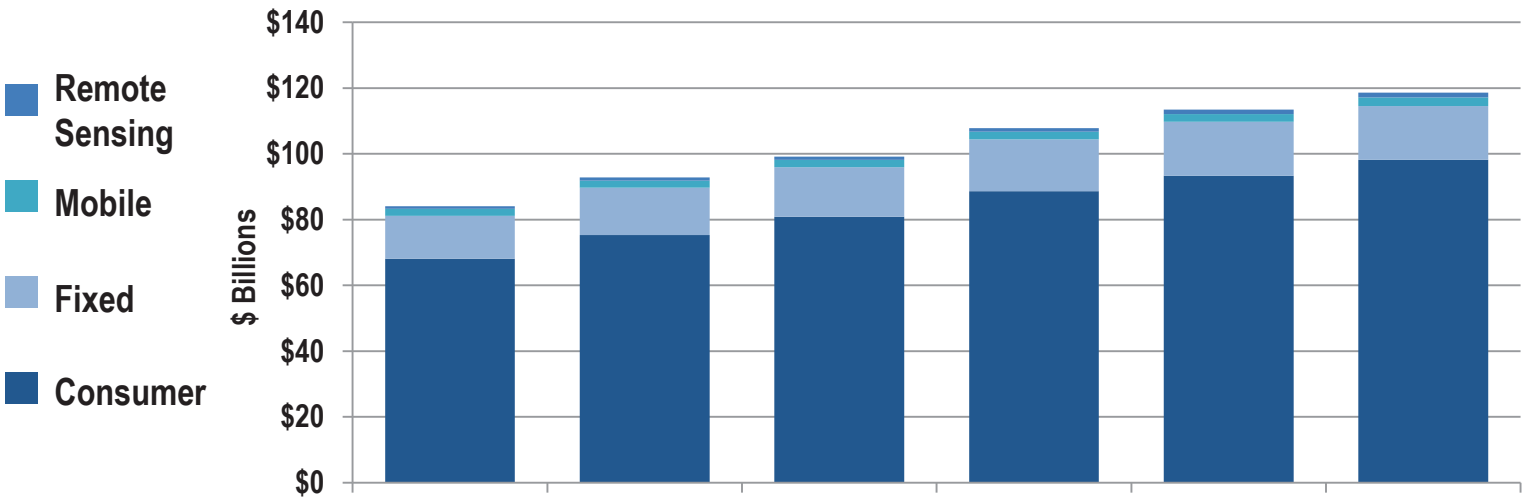
Global satellite industry revenues have nearly tripled since 2004, with an average annual growth rate of 11%

Satellite Industry Segments

Satellite Services

- Consumer Services
  - » Satellite Television
  - » Satellite Radio
  - » Satellite Broadband
- Fixed Satellite Services
  - » Transponder Agreements
  - » Managed Network Services (including spaceflight management services)
- Mobile Satellite Services
  - » Mobile Data
  - » Mobile Voice
- Remote Sensing/Imaging Services

Global Satellite Services Revenue



	2008	2009	2010	2011	2012	2013
Growth Rate	16%	10%	7%	9%	5%	5%
Total	**$84.1**	**$92.8**	**$99.2**	**$107.8**	**$113.5**	**$118.6**
Consumer	$68.1	$75.3	$80.9	$88.6	$93.3	$98.1
Satellite TV (DBS/DTH)	$64.9	$71.8	$76.9	$84.4	$88.4	$92.6
Satellite Radio (DARS)	$2.4	$2.5	$2.8	$3.0	$3.4	$3.8
Satellite Broadband	$0.8	$1.0	$1.2	$1.2	$1.5	$1.7
Fixed	$13.0	$14.4	$15.0	$15.7	$16.4	$16.4
Transponder Agreements (1)	$10.2	$11.0	$11.1	$11.4	$11.8	$11.8
Managed Services (2)	$2.8	$3.4	$3.9	$4.3	$4.6	$4.6
Mobile	$2.2	$2.2	$2.3	$2.4	$2.4	$2.6
Voice	$0.9	$0.7	$0.7	$0.7	$0.7	$0.8
Data	$1.3	$1.5	$1.6	$1.7	$1.8	$1.8
Remote Sensing	$0.7	$1.0	$1.0	$1.1	$1.3	$1.5

5%

2012 – 2013 Global Growth

The U.S. share of satellite services revenue in 2013 was

41%

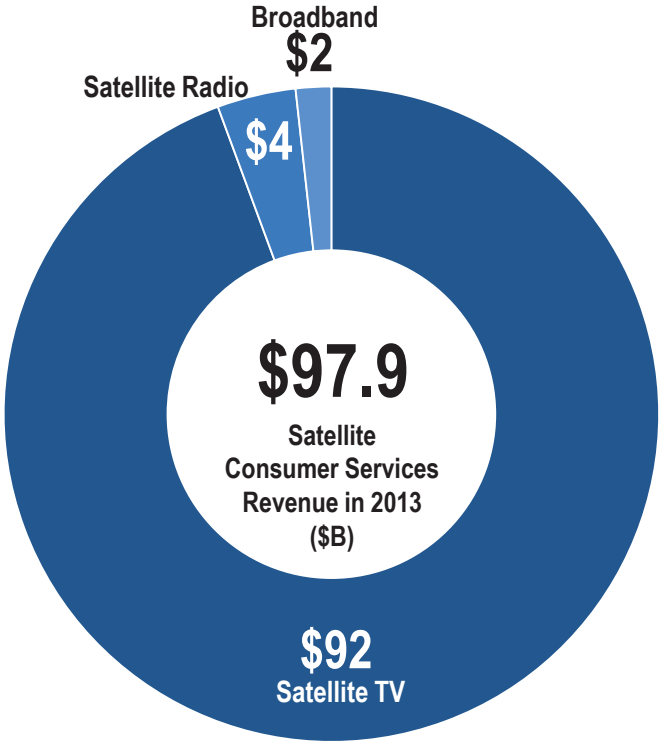
Notes: Numbers may not sum exactly due to rounding. 1) Includes capacity for DTH satellite TV platforms. 2) Includes VSAT networks

Satellite Services Findings: Consumer Services Highlights

The consumer services segment was the largest contributor to overall satellite services revenues and consists of satellite television, radio, and broadband

Satellite TV Services

- Satellite TV services (DBS/DTH) account for 78% of all satellite services revenues, and 94% of consumer revenues
- About 200 million satellite TV subscribers worldwide, driven by growth in emerging markets
- Significant portion of new subscribers are in India and Russia
- 42% of global revenues attributed to U.S.



Satellite Radio

- Satellite radio (DARS) revenues grew by 12% in 2013
- Satellite radio subscribers grew 6% in 2013 to over 25.5 million
- Primarily U.S. customer base

Satellite Broadband

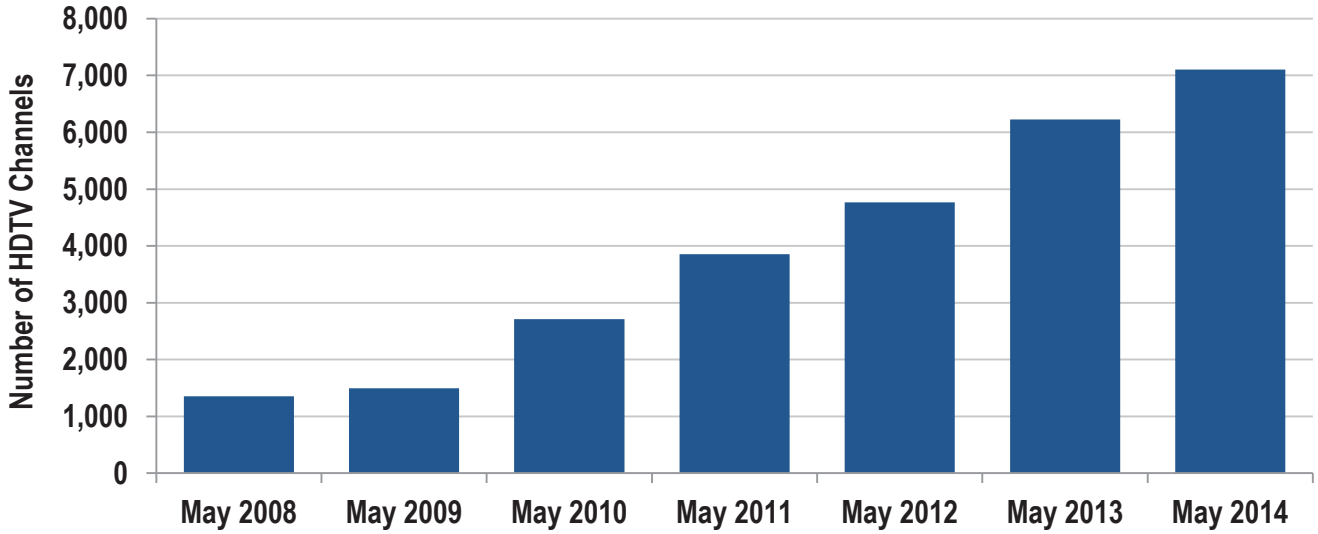
- Subscribers grew 20% in 2013, with over 1.2 million subscribers (mostly in the U.S.)
- Growth due in part to improvements to satellite broadband service quality, making it more competitive

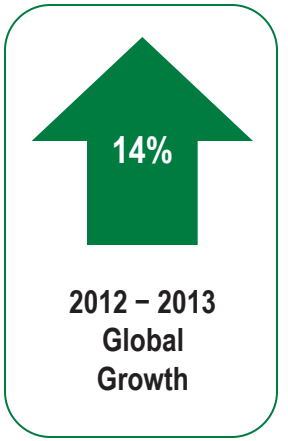
Satellite Services Findings

- Fixed satellite services remained flat
  - » Revenues for transponder agreements remained at the $11.8B level
  - » Revenues for managed services remained at the $4.6B level
- Mobile satellite services grew 6%
  - » Mobile satellite voice revenues grew 11%, compared to no growth in 2012
  - » Mobile satellite data revenues grew 5%, at the same rate as in 2012
- Remote sensing revenues grew 16%
  - » Continued growth by established satellite remote sensing companies, with government sales driving demand
  - » New entrants deployed test satellites and raised capital in 2013 (Skybox Imaging and Planet Labs)

Case Study: Impact of HDTV on the Satellite Industry

- High Definition Television (HDTV) continues to drive satellite industry revenues in three areas:
  - » Consumer satellite TV revenues bolstered by premium service payments
  - » FSS transponder agreement revenues increased, as HDTV channels require more satellite bandwidth to transmit than do standard channels and usually augment vs. replace standard content
  - » New satellite TV ground equipment purchases required for each new subscriber
- Nearly 59% of HDTV channels serve the Americas, with emerging growth in Europe and Asia



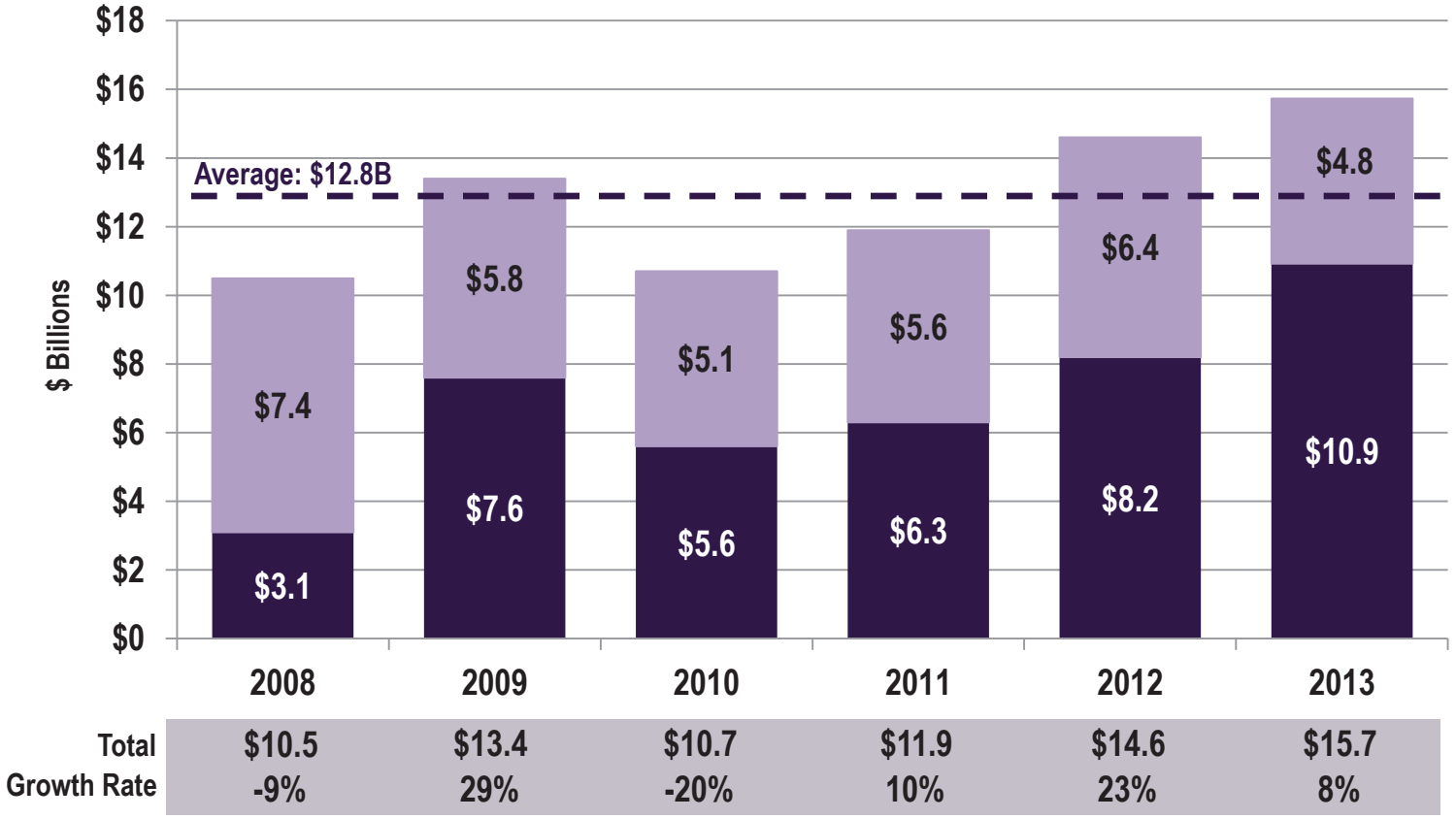


Source: LyngSat database

Satellite Industry Segments

Satellite Manufacturing

Satellite Manufacturing Revenues



2012 – 2013 Global Growth

Non-U.S.

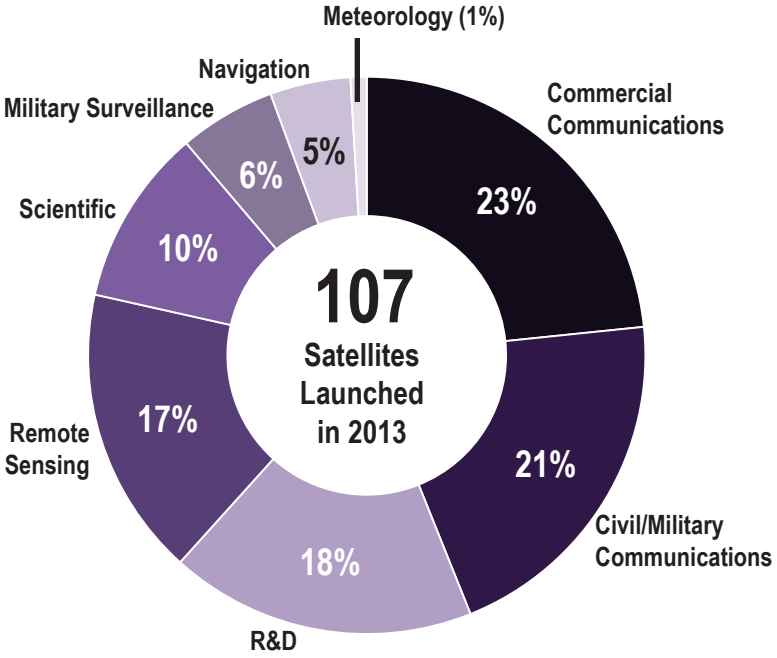
United States

- Worldwide 2013 revenues totaled $15.7 billion
- U.S. share of global revenues neared 70%, a 10 point increase from 2012

NOTE: Satellite manufacturing revenues are recorded in the year the launch was conducted

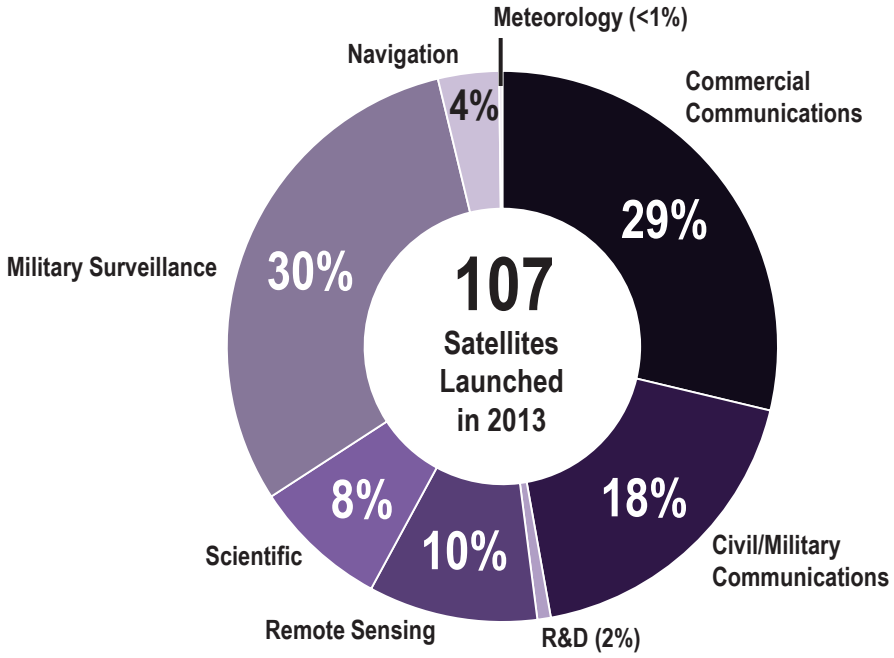
Satellite Manufacturing Findings

- 107 satellites launched in 2013, up from 81 launched in 2012



Number of Spacecraft Launched by Mission Type (2013)

- Communications satellites represented 47% of total revenues generated
- Military surveillance satellites accounted for 30% of total revenues generated in 2013
- Cubesats represented the majority of R&D satellites, but less than 1% of the revenues

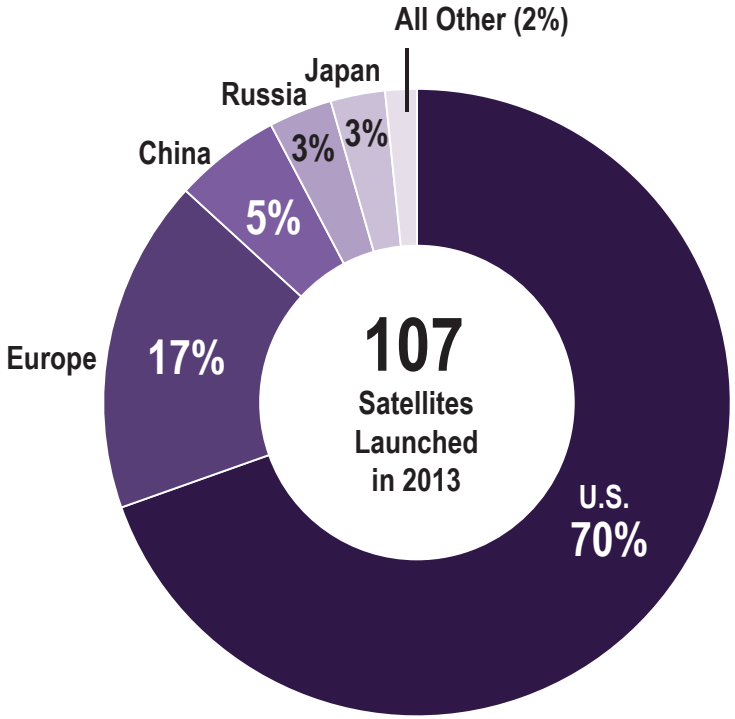


Value of Spacecraft Launched by Mission Type (2013)

Note: Does not include satellites built by governments or universities, or classified satellites

U.S. Satellite Manufacturing Findings

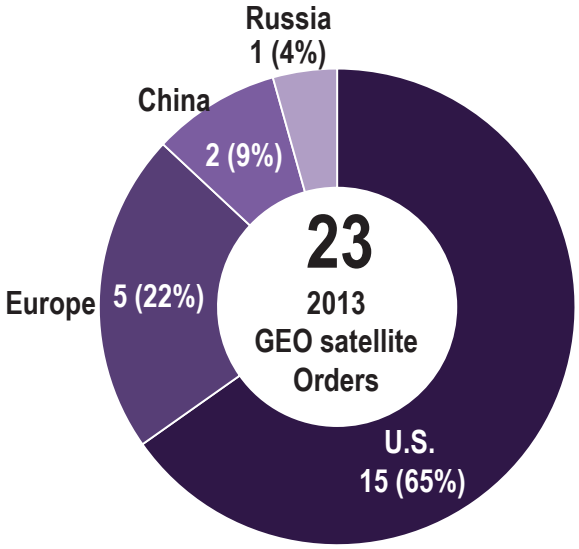
- U.S. satellite manufacturing revenues increased 33% (slightly more than in 2012)
- U.S. firms built about 27% of the spacecraft launched in 2013, and earned 70% of global satellite manufacturing revenues
- 75% of U.S. satellite manufacturing revenues were from U.S. government contracts



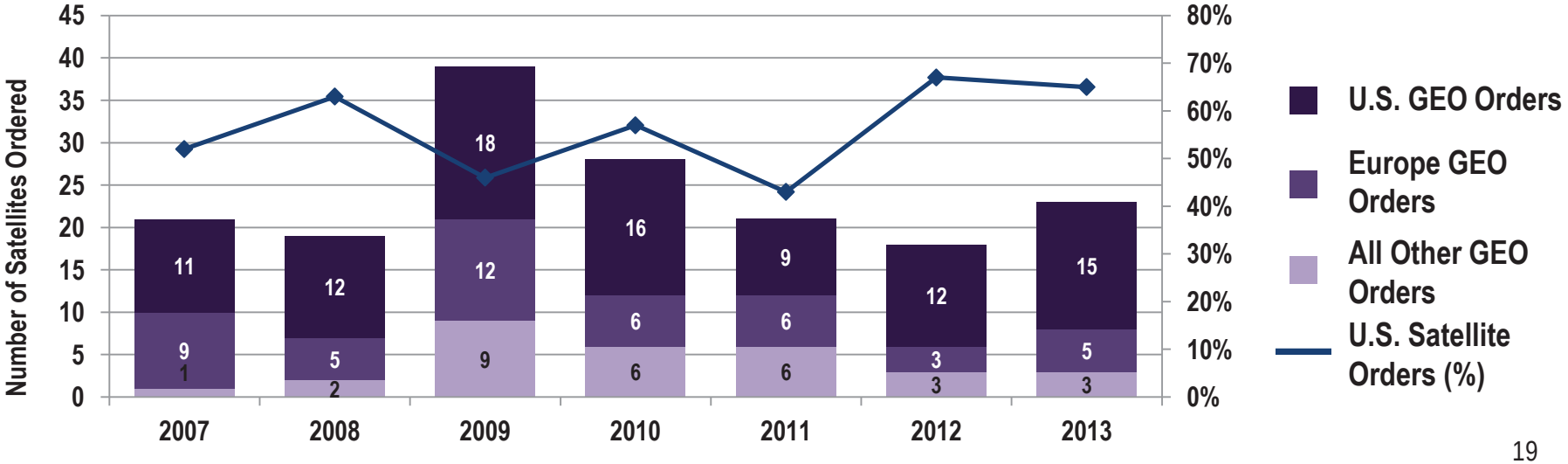
Value of Spacecraft Launched by Country/Region of Manufacturer (2013)

Does not include government-built or university-built satellites. Based on unclassified sources.

Future Indicator: Commercial Satellite Manufacturing Orders



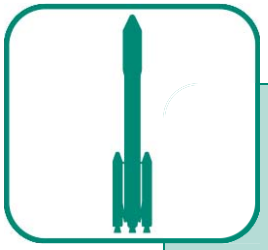
- Orders for 23 commercial GEO satellites were announced in 2013, 5 more than in 2012
- 15 orders were won by U.S. manufacturers
- 65% share of orders won by U.S. firms remains close to peak win percentage reached in 2012



Case Study: Manufacturing Trends – Innovation in Spacecraft

- **High throughput satellites (HTS)** apply several technologies to maximize efficiency: frequency reuse, spot beams, and/or on-board processing
- **HTS** provide double or more throughput capability than traditional FSS satellites, while using the same RF spectrum allocations (C, Ku- and Ka-bands)
  - » 27 satellites with HTS-capable payloads currently on orbit, with 24 HTS on order and/or under construction
  - » Although HTS are mostly in GEO, 4 HTS were launched to MEO in 2013 for O3b's broadband constellation, with 8 more awaiting launch or under construction
- **All-electric propulsion** provides a significant reduction on satellite weight, but requires more transit time to reach final GEO orbit
  - » First orders for all-electric commercial communications satellites placed in 2012
  - » First orders for all-electric U.S. Government satellites placed in 2013
  - » Most prime manufacturers now offer this technology to customers

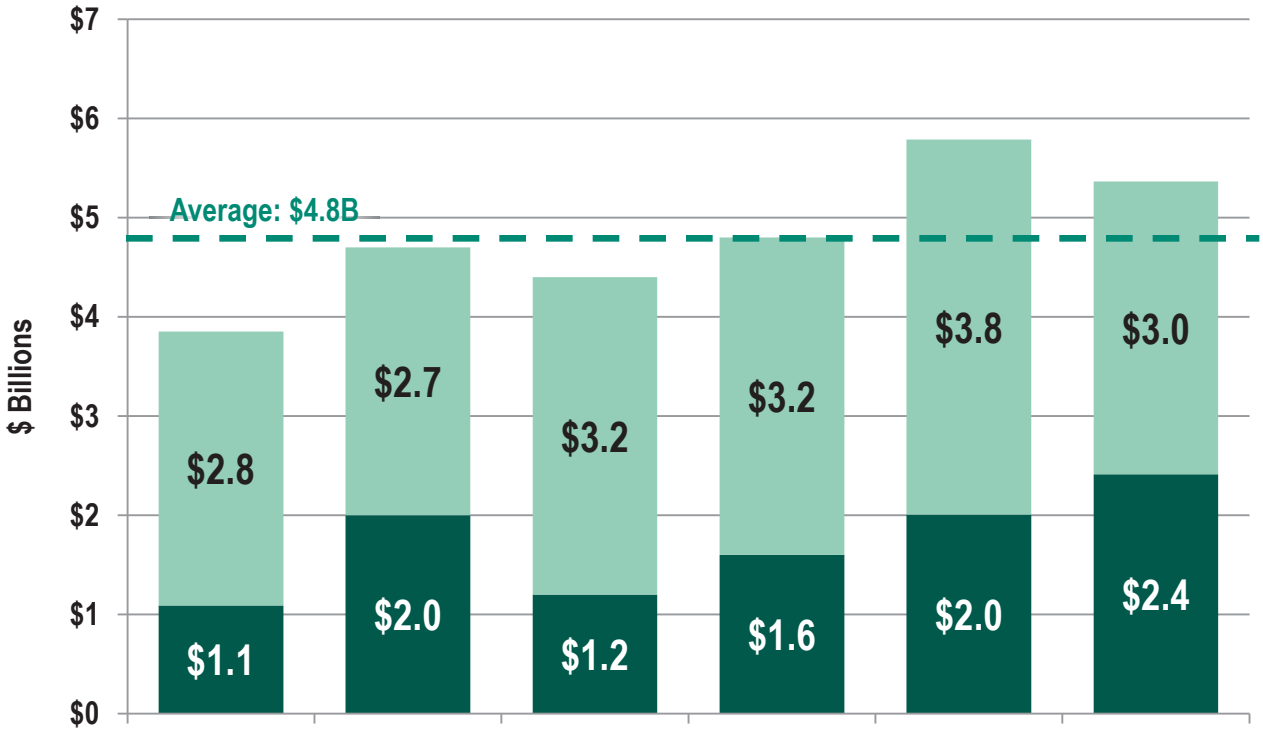
Satellite Industry Segments



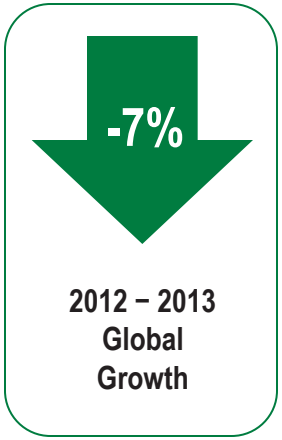
Launch Industry

- Launch Services
- Launch Vehicles

Satellite Launch Industry Revenues



	2008	2009	2010	2011	2012	2013
Total	$3.9	$4.5	$4.4	$4.8	$5.8	$5.4
Growth Rate	21%	17%	-2%	9%	21%	-7%



Non-U.S.

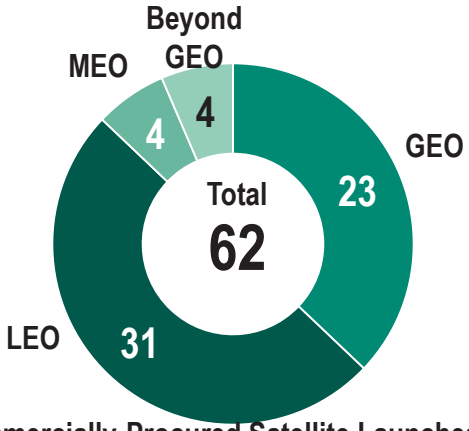
United States

- $5.4B global revenues in 2013 from commercially-procured satellite launches
- U.S. share of global launch revenues grew from 35% to 45%

Note: Launch industry revenues are recorded in the year the launch was conducted. 2012 launch revenues for Non-U.S. have been adjusted to reflect more accurate pricing information released by the Russian government

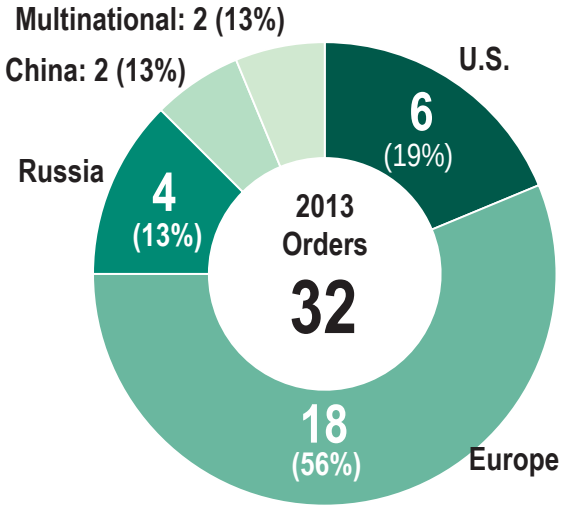
Satellite Launch Industry Findings

- The number of commercially-procured launches conducted worldwide in 2013 (62) was up slightly from 2012 (59)
- Overall satellite launch industry revenues decreased by 7% globally in 2013, compared with a 21% increase in 2012. The lower revenues stemmed from fewer higher-cost launches, including:
  - » 3 fewer commercially-procured Arianespace launches than in 2012
  - » Only 1 Sea Launch conducted in 2013, versus 3 in 2012
- Government customers worldwide remained the major satellite launch revenue driver, reaching 70% of commercially-procured satellite launch revenues, up from 64% in 2012
- The U.S. had the largest share of commercially-procured launch revenues (45%), with over 70% of the revenues coming from launching U.S. government satellites

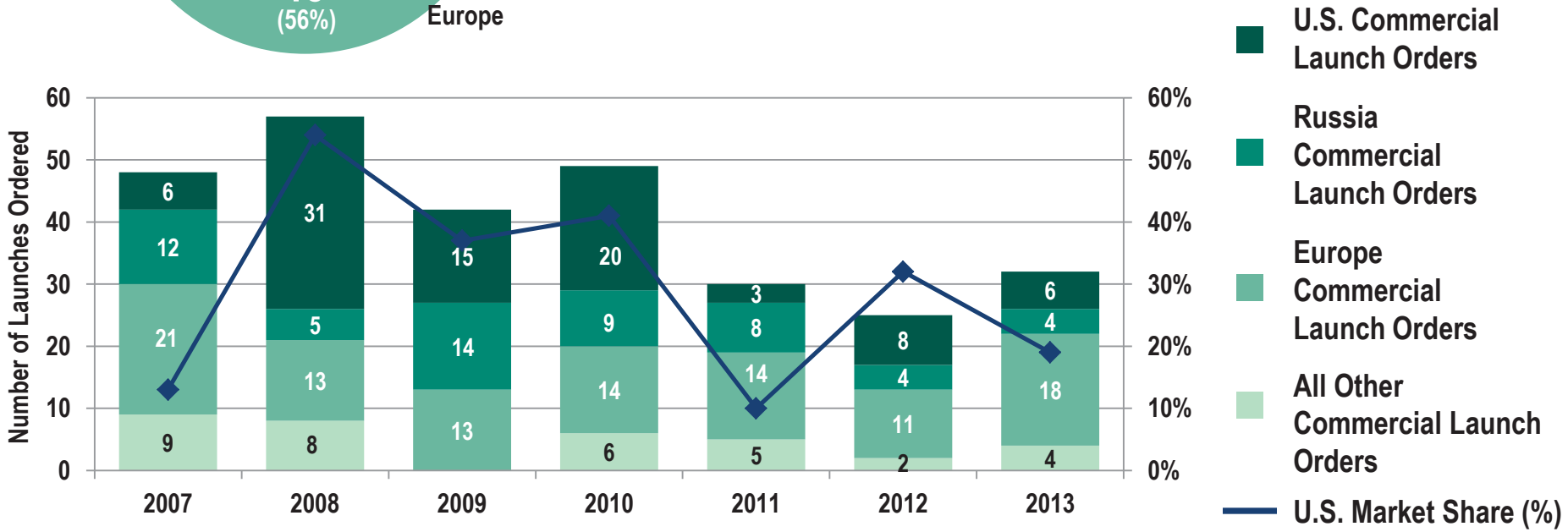


2013 Commercially-Procured Satellite Launches by Orbit

Future Indicator: Commercial Satellite Launch Orders



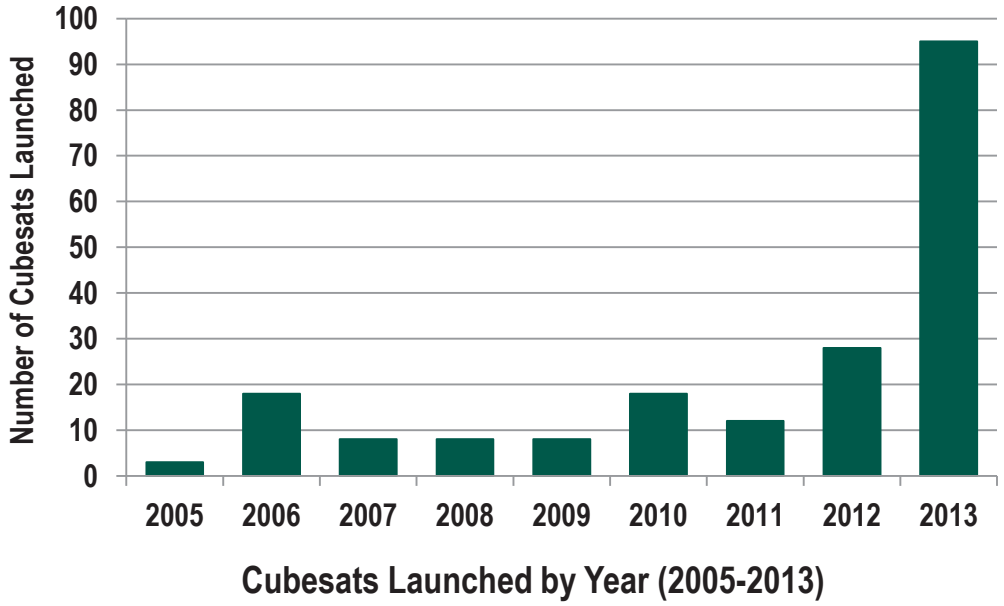
- Orders to launch 32 satellites were placed in 2013, up from 25 in 2012
- 6 satellite launch orders were won by U.S. companies, down 25% from 8 in 2012
- Europe's launch provider retained the largest share of commercial launch orders (18)



NOTE: A single launch contract may cover the launch of more than one satellite (each described as an "order")

Case Study: Cubesats

- 91 cubesats were launched in 2013, more than in the last 8 years combined
- Not a major driver of launch revenues, ~$100,000 to launch, and cubesats for education launch for free
- Cubesat are used predominantly for test and R&D by governments, universities, and non-profits
- 8 commercial cubesats launched in 2013 for remote sensing and communications
- All cubesats currently launched to LEO, developments underway to send cubesats GEO in late 2015



What is a Cubesat?

A cubesat is a cube-shaped satellite bus measuring 10cm on a side, with a mass of 1-2 kilograms. Several can be stacked together (2U, 3U, 6U) depending on mission

Cubesat Costs

» **Low Cost:** 1U cubesat bus kits can be purchased for $13,000, with 6U configurations reaching around $30,000

» **Moderate Cost:** Boeing-built cubesat platforms for NRO are expected to cost no more than $250,000

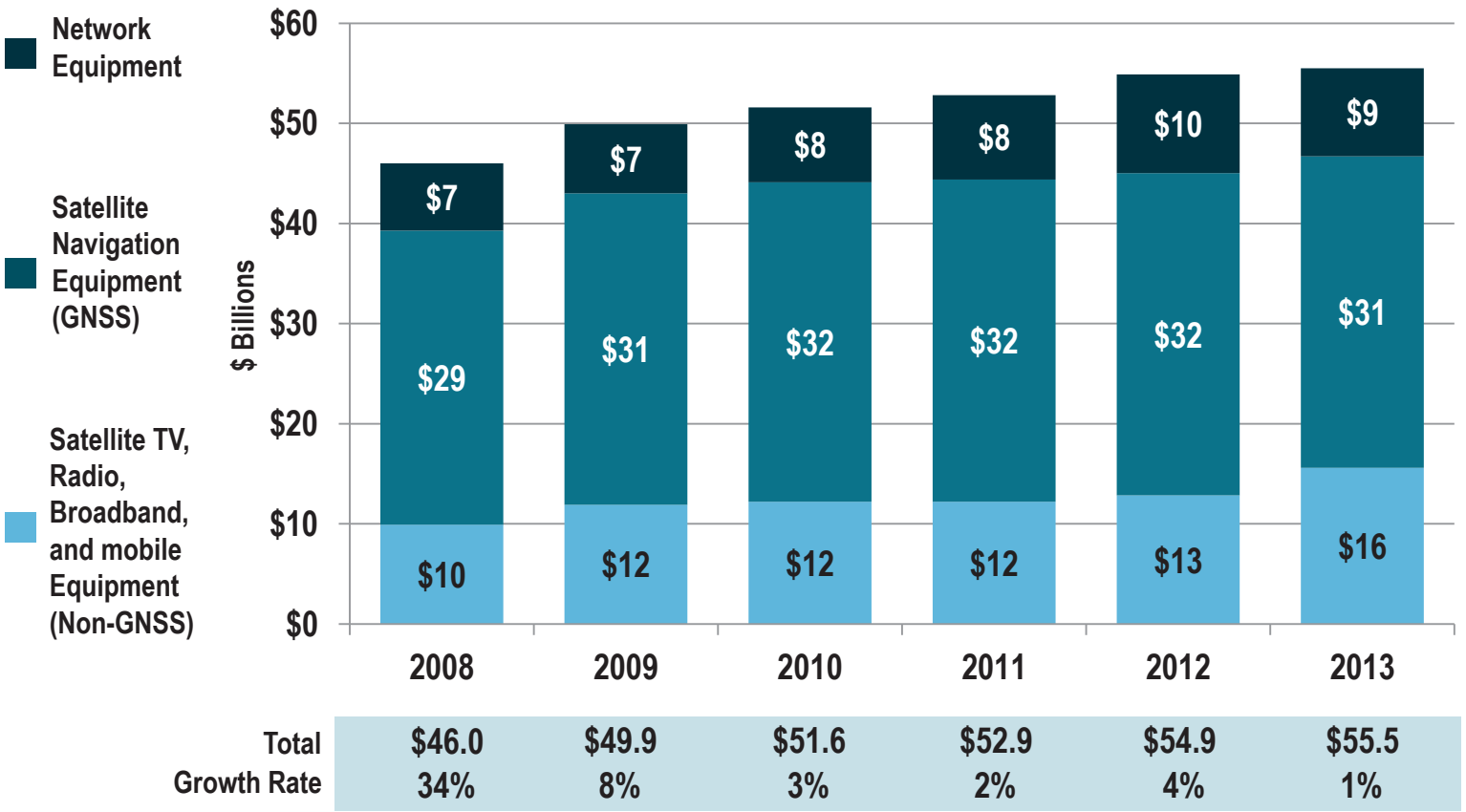
» **Higher Cost:** NASA expects that cubesats used for planetary science missions may cost between $3-$10 million

Satellite Industry Segments

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

Global Satellite Ground Equipment Revenues



	2008	2009	2010	2011	2012	2013
Total	$46.0	$49.9	$51.6	$52.9	$54.9	$55.5
Growth Rate	34%	8%	3%	2%	4%	1%

1%

2012 – 2013 Global Growth

The U.S. share of ground equipment revenue in 2013 was **43%**

Includes:

Network Equipment — Gateways, Network Operations Centers (NOCs), Satellite News Gathering (SNG) equipment, flyaway antennas, and Very Small Aperture Terminal (VSAT) equipment

Consumer Equipment — Satellite TV, radio, and broadband equipment, mobile satellite terminals, and stand-alone satellite navigation devices, not including chipsets integrated into devices (such as smartphones) whose primary use is not satellite navigation

Ground Equipment Findings

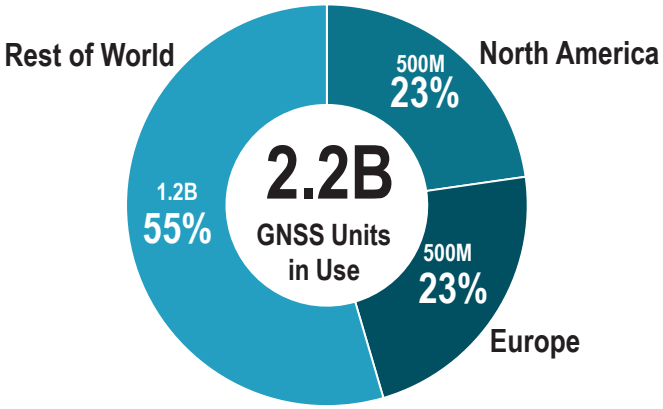
- Global satellite ground equipment revenues grew 1% in 2013
- Network equipment revenues decreased 10%
- Satellite navigation (GNSS) equipment represents nearly 57% of overall ground equipment revenue down from 60% in 2012
  - » Revenue down 3% this year, reflecting a migration away from stand-alone devices (included in this study) towards embedded chipsets (not included in this study)
- Consumer equipment revenues grew 22% with more terminals in service across all segments (satellite TV, radio, broadband equipment, and mobile satellite terminals) in 2013

Case Study: Market for Satellite Navigation Equipment

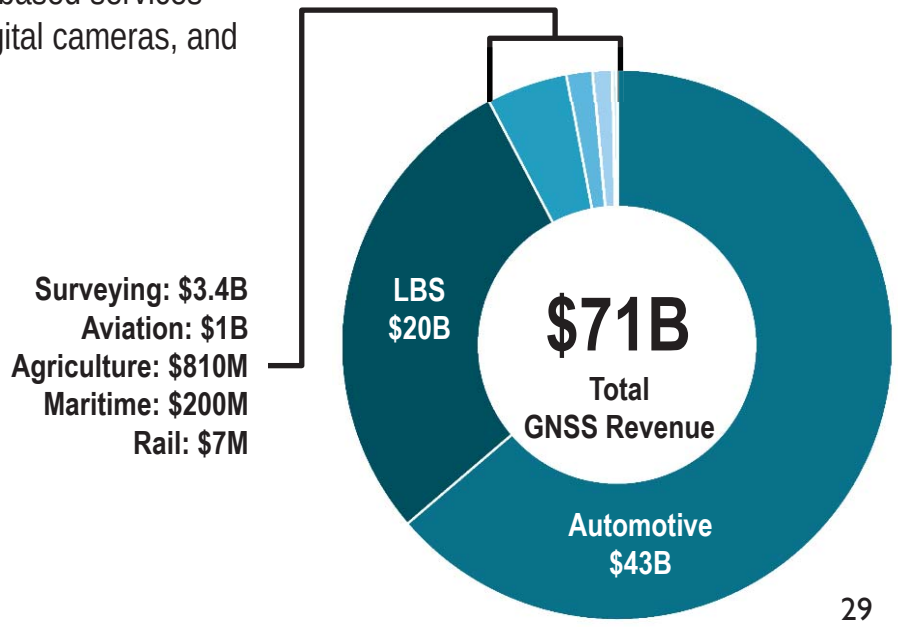
- Global Satellite Navigation System Services (GNSS) equipment supports the use of satellites for positioning, navigation, and timing services using stand-alone devices or embedded chipsets
  - » Includes devices receiving signals from the Navstar GPS (U.S.), GLONASS (Russia), BeiDou/Compass (China), and Galileo (Europe) satellite constellations
  - » ~$70B direct sales of GNSS devices worldwide
  - » ~2.2B GNSS-enabled devices currently in use, with about 7 billion projected by 2022
  - » 47% of GNSS revenues come from chipset location-based services (LBS) embedded in smart phones, pads, laptops, digital cameras, and other mobile devices

Key GNSS Markets

- Agriculture
- Automotive
- Aviation
- Location-Based Services (LBS)
- Maritime
- Rail
- Surveying



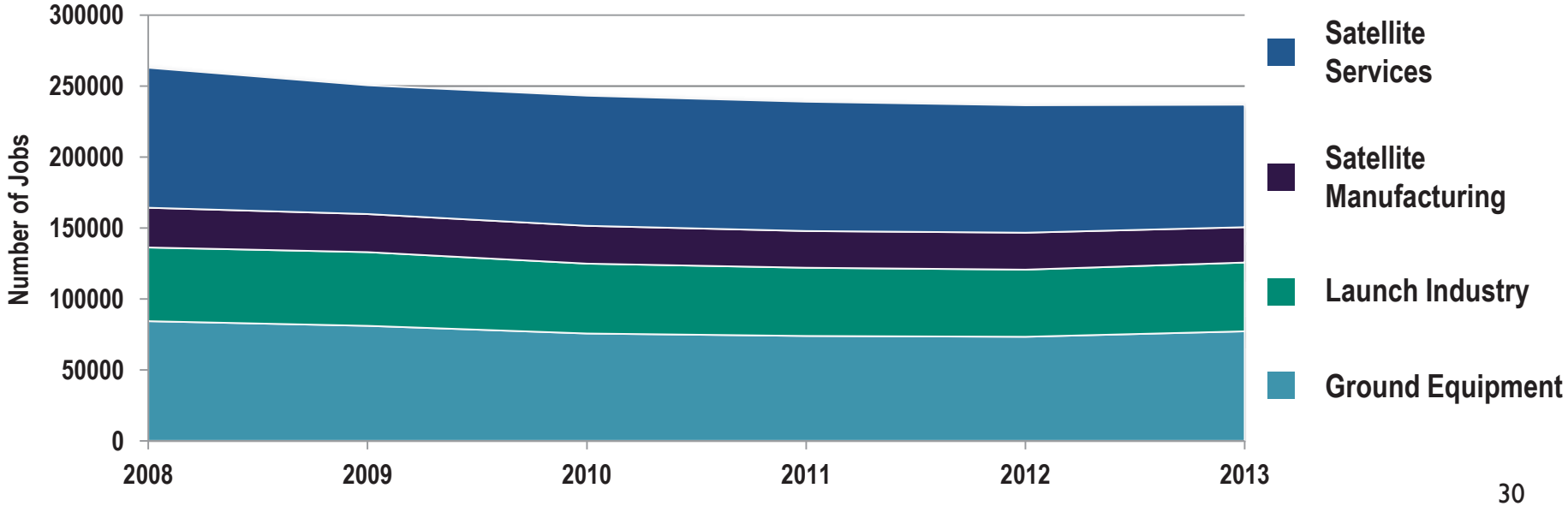
Global Number of GNSS Devices In Use in 2013



Source: GNSS Market Report (October 2013), European GNSS Agency. Note: Case study reflects total market for equipment including stand alone devices (in this study) and embedded chipsets (not in the study)

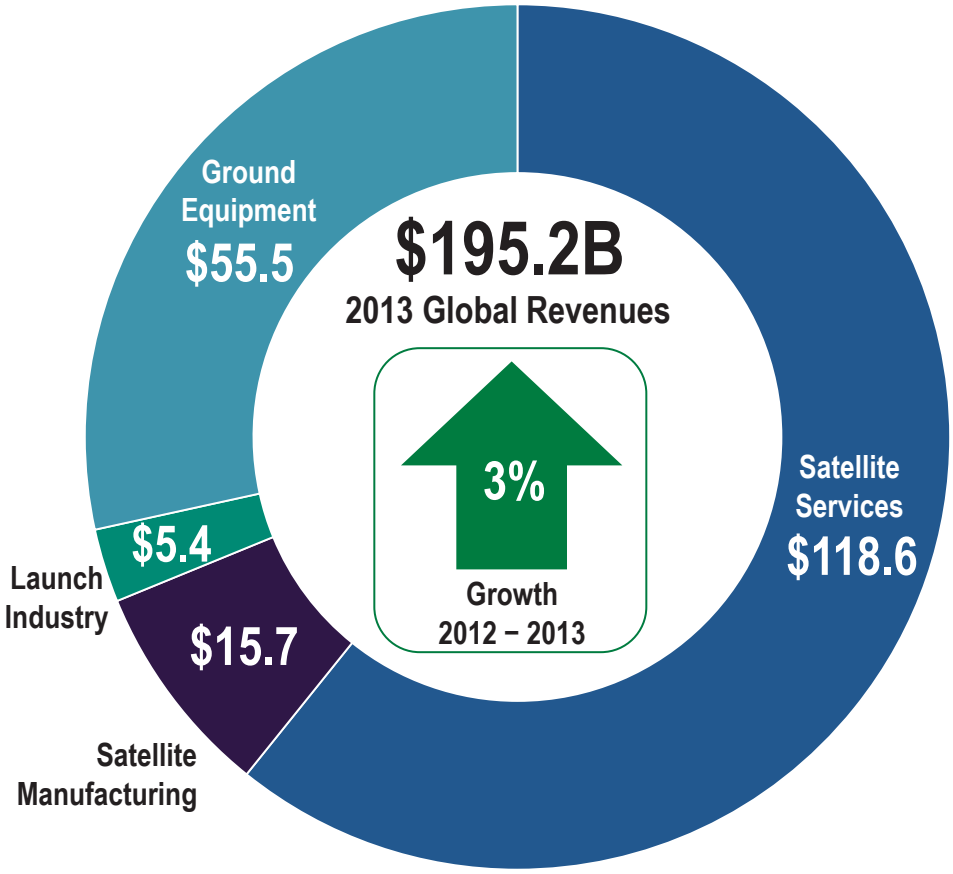
2013 U.S. Employment Estimates (Private Sector Employment Only)

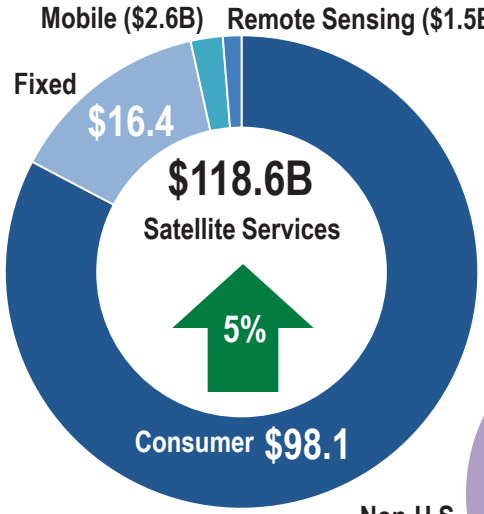
- Satellite industry employment in the U.S. remained essentially flat in 2013, increasing by less than 400 jobs (~0.1%)
- While U.S. satellite companies reduced employment by 10% between 2008 and 2012, individual segment employment is beginning to recover, as evidenced by the slight overall increase
- Two of the four satellite industry segments added jobs in 2013
  - » Satellite Services added 3,851 jobs, or +5% (2012: +4%)
  - » Satellite Manufacturing employment decreased by 1,041 jobs, or -4% (2012: -4%)
  - » Launch Industry employment increased by 1,155 jobs, or +2% (2012: -2.4%)
  - » Ground Equipment employment decreased by 3,595 jobs, or -4% (2012: -4%)

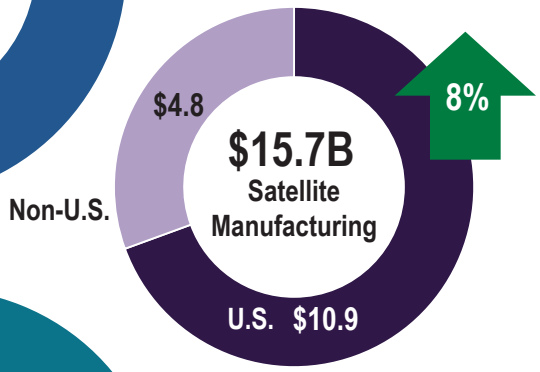


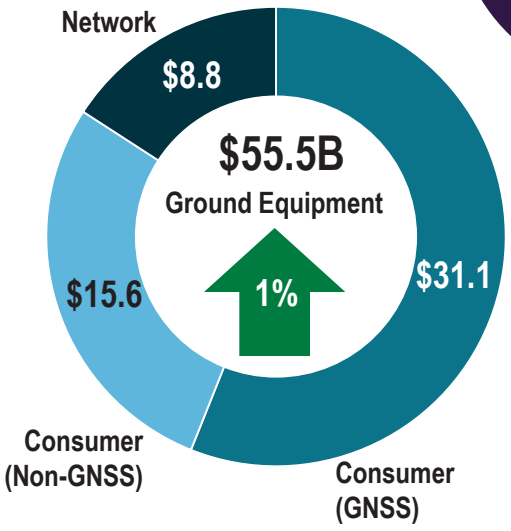
Source: U.S. Bureau of Labor Statistics (BLS).

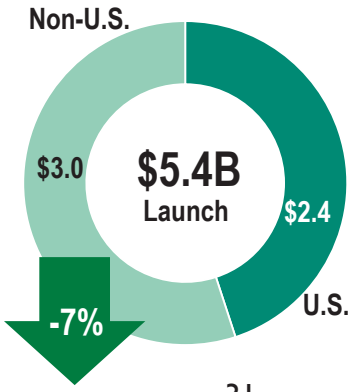
2013 Satellite Industry Indicators Summary





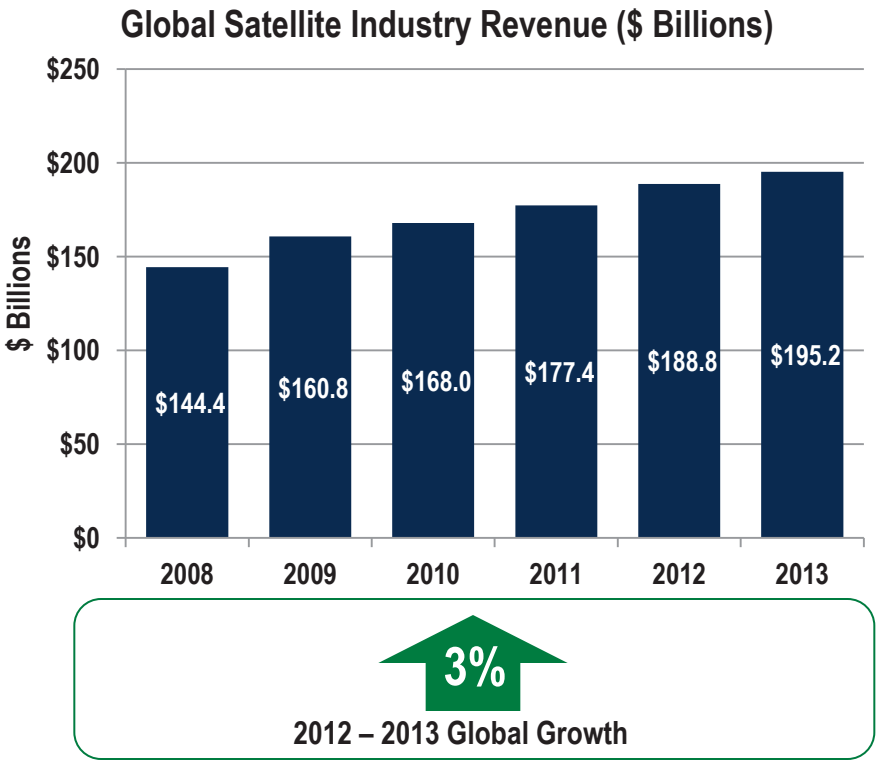






Summary: Top-Level Global Satellite Industry Findings

- Satellite industry revenue was $195.2 billion in 2013
  - » Growth of 3% worldwide in 2013
  - » Decrease from 7% growth rate in 2012
  - » The satellite industry fares well with tracking industries



- Three of the four satellite industry segments surveyed posted growth in 2013
  - » **Satellite services**, the largest segment, grew by 5% - consumer services continues to be a key driver for the overall satellite industry
  - » **Satellite manufacturing** revenues grew by 8%, due to proportionally more expensive commercial GEO and government satellites in 2013
  - » **Launch industry** revenues decreased by 7% in 2013, reflecting fewer launches by Europe and Sea Launch
  - » **Ground equipment** revenues grew 1% in 2013, with increasing growth in consumer equipment and slowing in network and consumer GNSS equipment

Contact

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