



U.S. SPACE INDUSTRY 'DEEP DIVE'

A COLLABORATION BETWEEN THE DOC AND THE USAF, NASA, AND NRO

FINAL DATASET FINDINGS

FAA Commercial Space Transportation Conference
February 5, 2014

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Source: U.S. Department of Commerce, Bureau of Industry and Security,
U.S. Space Industry Deep Dive Assessment, February 2014.

BIS/OTE Industry Assessments – Background

- Under the Defense Production Act of 1950 and Executive Order 13603, ability to survey and assess:
 - Economic health and competitiveness
 - Defense capabilities and readiness
- Mandatory Data Collection Authority under Section 705 of the Defense Production Act.
- Enable industry and government agencies to:
 - Share data and collaborate in order to ensure a healthy and competitive industrial base
 - Monitor trends and benchmark industry performance
 - Raise awareness of diminishing manufacturing and technological capabilities

OTE Industry Assessments – Completed Assessments

Over 50 industry studies and more than 150 survey instruments since 1986, including:

- Consumers of Electro-Optical Satellite Imagery
- Cartridge and Propellant Actuated Devices (CAD/PADs) – 4th Review
- Telecommunications Industry Infrastructure
- NASA Industrial Base – Post-Space Shuttle/Constellation Program
- Healthcare and Public Health Sector - Foreign Sourcing
- Night Vision Focal Plane Arrays, Sensors, and Cameras
- Counterfeit Electronics
- Imaging and Sensors Industry
- DoD Obsolescence Cost Metrics - DMSMS
- Shipbuilding and Repair Industry
- Munitions Power Sources - Batteries
- U.S. Microchip Fabrication and Design Capabilities
- C-17 Aircraft Supply Chain Network

U.S. Space Industry 'Deep Dive' Assessment - Background

- Partnership with the U.S. Air Force, National Aeronautics and Space Administration, and the National Reconnaissance Office.
- The principle goal is to gain an understanding of the intricate supply chain network supporting the development, production, and sustainment of products and services across the defense, intelligence, civil, and commercial space sectors.
- Objectives:
 - a) Map the space industrial base supply chain in unprecedented detail;
 - b) Identify interdependencies between respondents, suppliers, customers, and USG agencies;
 - c) Benchmark trends in business practices, competitiveness issues, financial health, etc. across many tiers of the industrial base; and
 - d) Share data with USG stakeholders to better inform strategic planning, targeted outreach, and collaborative problem resolution.

Space Industry Survey Topics

(Covers 2009 - 2012)

- Financials
- Research & Development
- Capital Expenditures
- Employment
- Mergers & Acquisitions
- Sales
- Areas of Potential USG Assistance for Respondents
- Impacts of Decreased USG Demand
- Impact of U.S. Export Controls
- 205 USG Space Programs
- Suppliers (U.S. & non-U.S.)
- Customers (U.S. & non-U.S.)
- Top Competitors (U.S. & non-U.S.)
- Codes: DUNS, CAGE, NAICS
- Capacity Utilization and Inventory
- Rare Earth Elements and Counterfeiting Issues
- Challenges to Competitiveness
- SBIR and STTR Awards

This presentation only scratches the surface of our data.

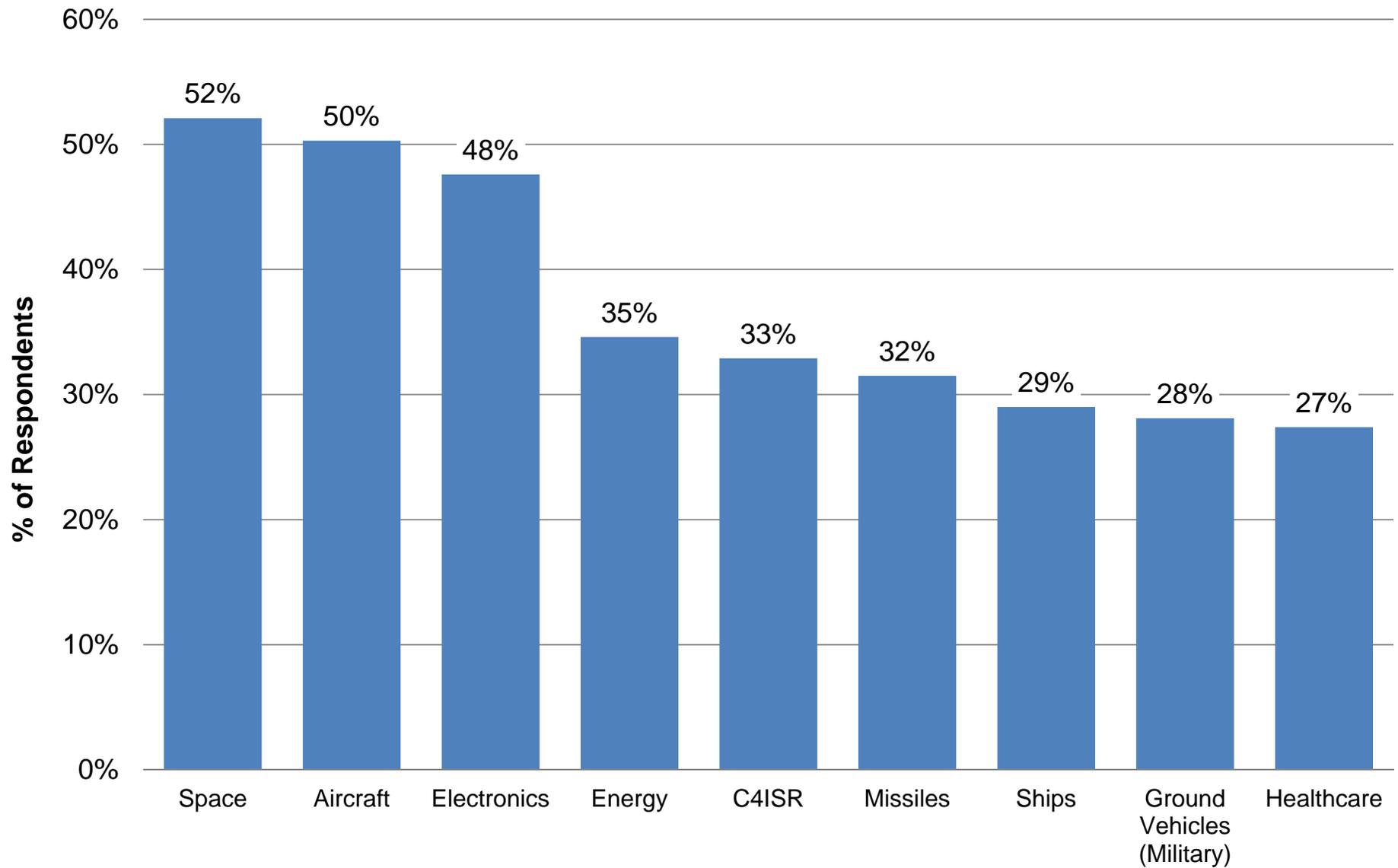
Overview of Respondents

| Respondents by Type of Organization | |
|-------------------------------------|--------------|
| Commercial Companies | 3,585 |
| Universities | 125 |
| Non-Profit Organizations | 49 |
| U.S. Government Agencies | 21 |
| Total | 3,780 |

62% of respondents are small businesses, as defined by the Small Business Administration

| Respondents by Average Annual Net Sales (2009-2012) | |
|---|-------|
| Very Small (Less than \$10M) | 1,648 |
| Small (\$10 – 50M) | 929 |
| Medium (\$50 – 250M) | 498 |
| Large (\$250M – 1B) | 234 |
| Very Large (Greater than \$1B) | 165 |
| No Sales | 306 |

Involvement in Market Segments



Source: U.S. Department of Commerce, Bureau of Industry and Security,
U.S. Space Industry Deep Dive Assessment, February 2014.

Structure of the DOC Survey

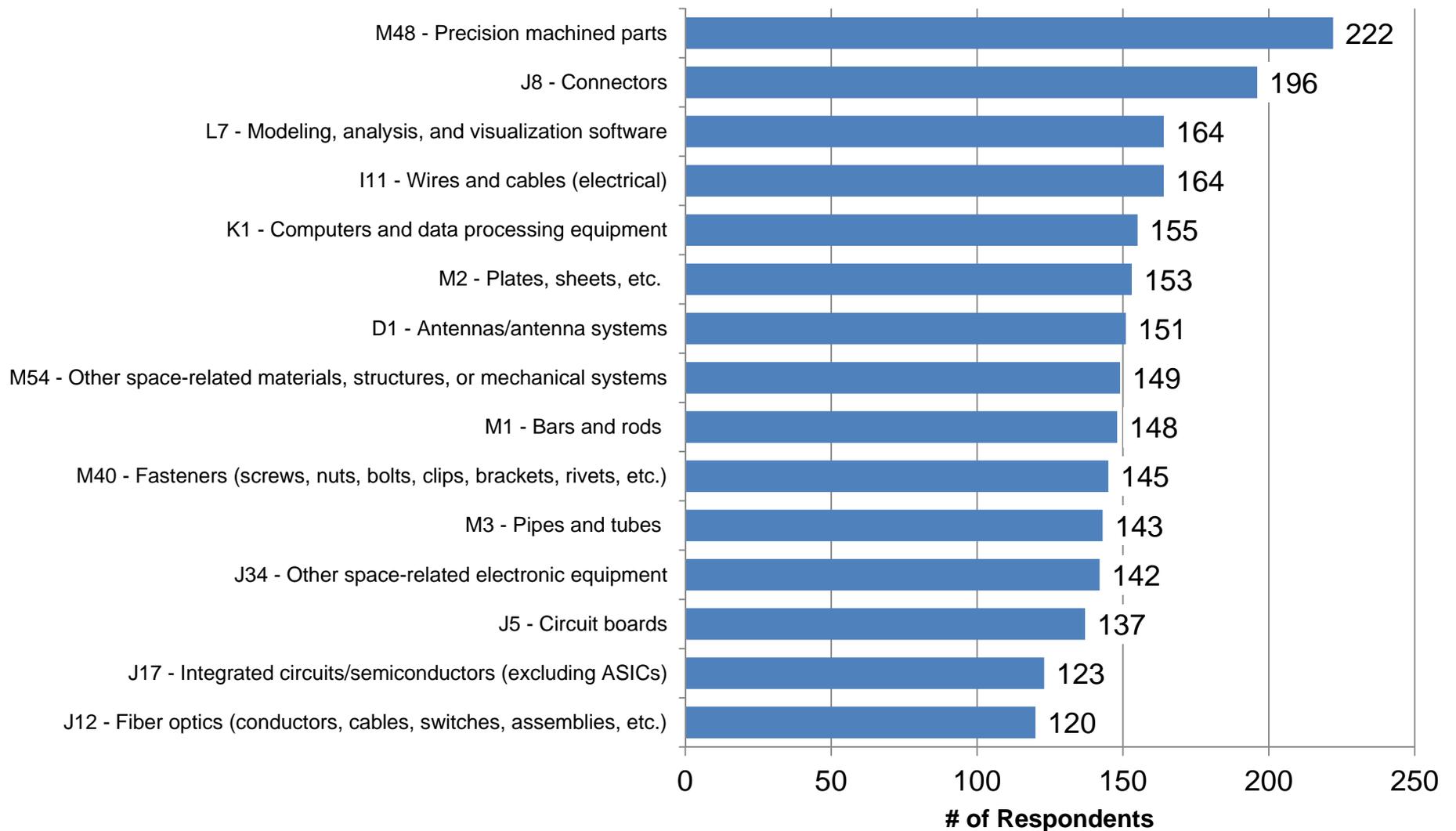
Created 16 general segments comprised of 360 individual products & services.

Product and Service Segments:

- | | |
|--|--|
| A. Spacecraft & Launch Vehicles | I. Power Sources & Energy Storage |
| B. Propulsion Systems & Fuels | J. Electronic Equipment |
| C. Navigation & Control | K. Computer Hardware & Robotics |
| D. Communications Systems | L. Software |
| E. Space Survivability, Environmental Control/Monitoring, and Life Support | M. Materials, Structures, and Mechanical Systems |
| F. Payload Instruments & Measurement Tools | N. Manufacturing Tools & Specialty Equipment |
| G. Ground Systems | O. Services |
| H. Non-Earth Based Surface Systems | P. Research & Development |

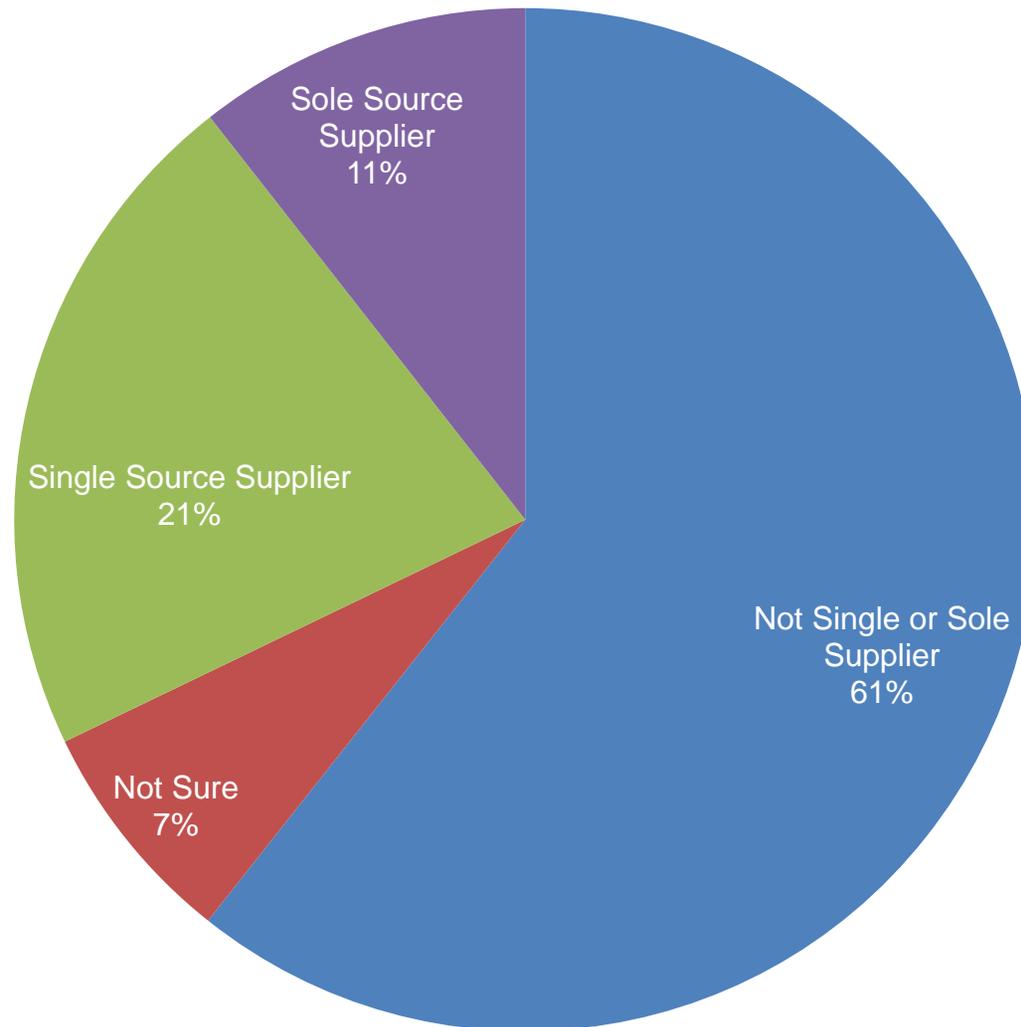
Respondents detail their critical suppliers, customers, and involvement in over 205 USG space programs.

Top 15 Product/Service Areas Provided by Respondents – Excluding Services and R&D



Source: U.S. Department of Commerce, Bureau of Industry and Security,
U.S. Space Industry Deep Dive Assessment, February 2014.

Single and Sole Source Suppliers*



7,361 unique critical suppliers.

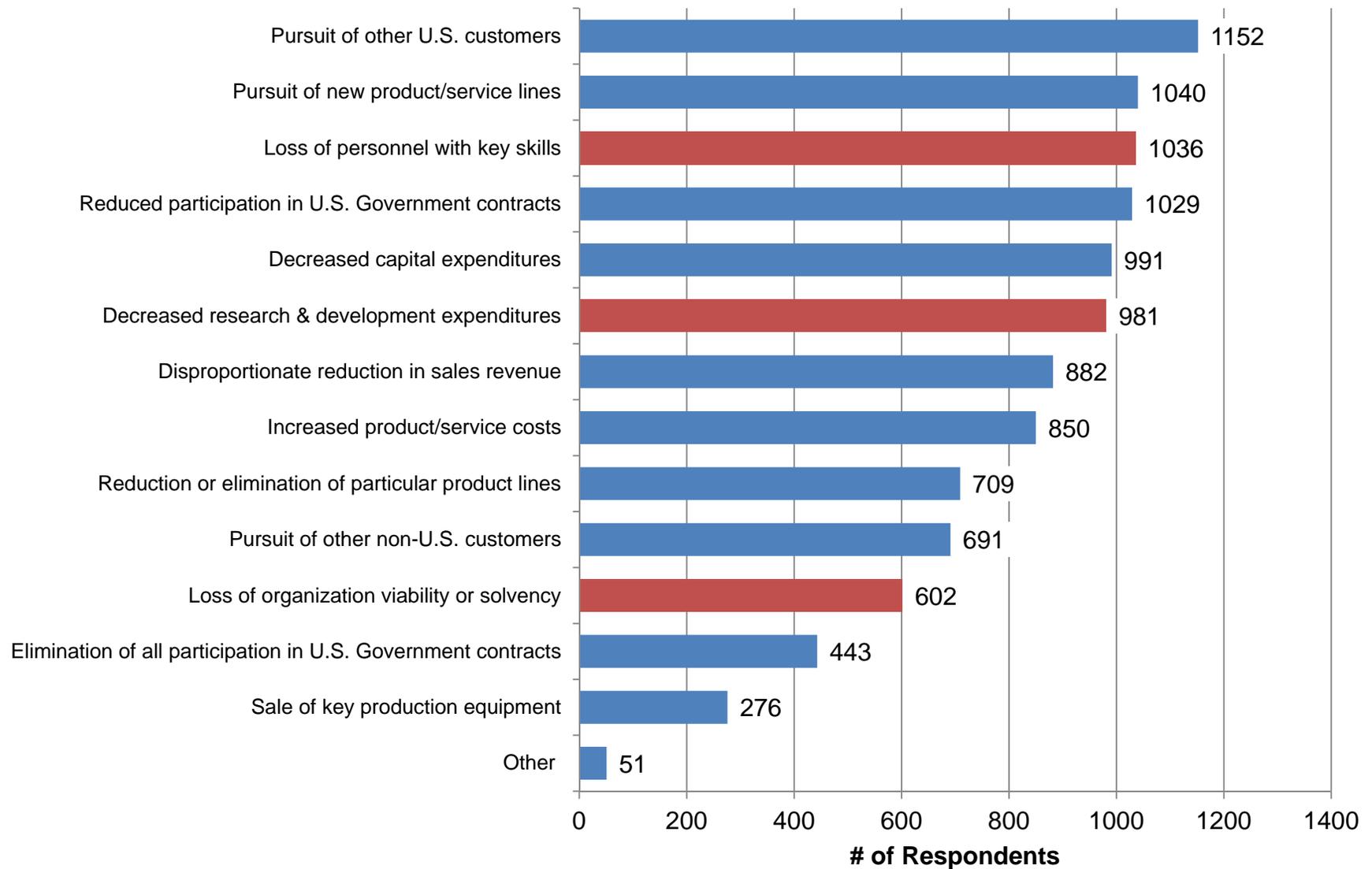
Top 5 Sole Source Product/Service Areas:

1. Integrated circuits/semiconductors
2. Adhesives
3. Chemicals
4. Machining services
5. Antennas/antenna systems

* As a percentage of total products/services provided.

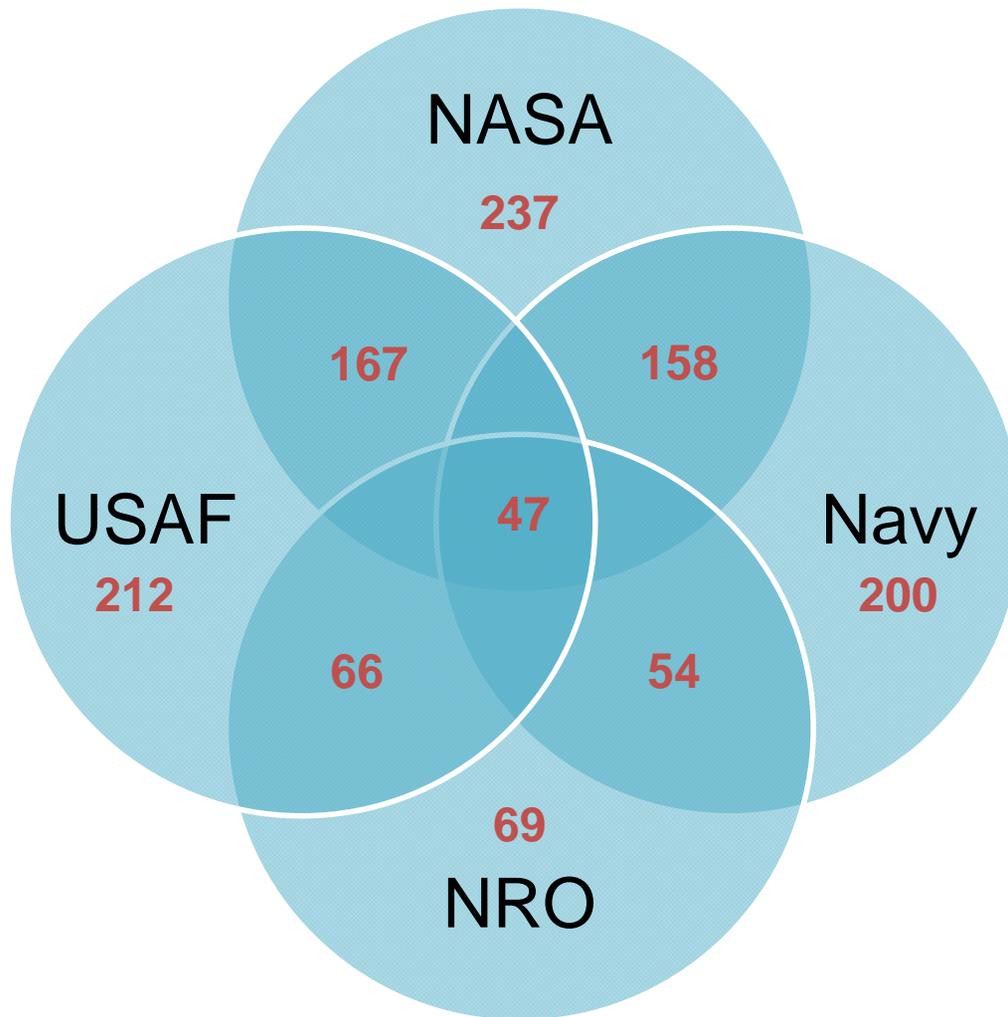
Source: U.S. Department of Commerce, Bureau of Industry and Security, *U.S. Space Industry Deep Dive Assessment*, February 2014.

Potential Impacts of a Sudden Decrease in USG Space-Related Demand



Source: U.S. Department of Commerce, Bureau of Industry and Security,
U.S. Space Industry Deep Dive Assessment, February 2014.

Shared Government Risk

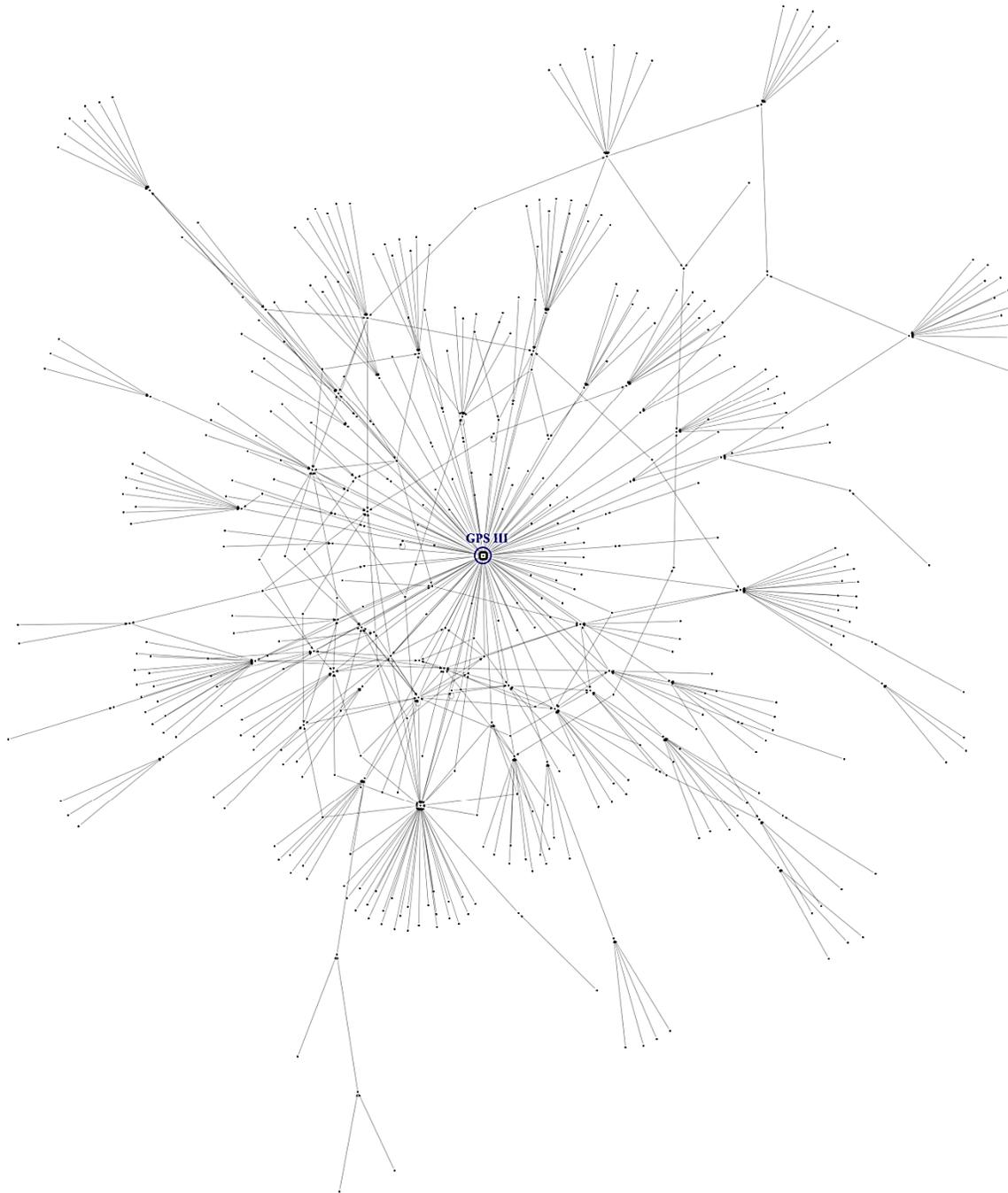


354 respondents were determined to be financially high/severe risk.*

Sample of four USG agencies and their shared supplier risk.

Cross-cutting relationships can be viewed by product or program.

* Based on a series of financial risk measures, taking into account profitability, liquidity, leverage, and others.



Supply Chain Mapping: GPS III

462 entities in supply chain map.

43 respondents – indicated potential loss of viability/solvency with a sudden decrease in USG demand.

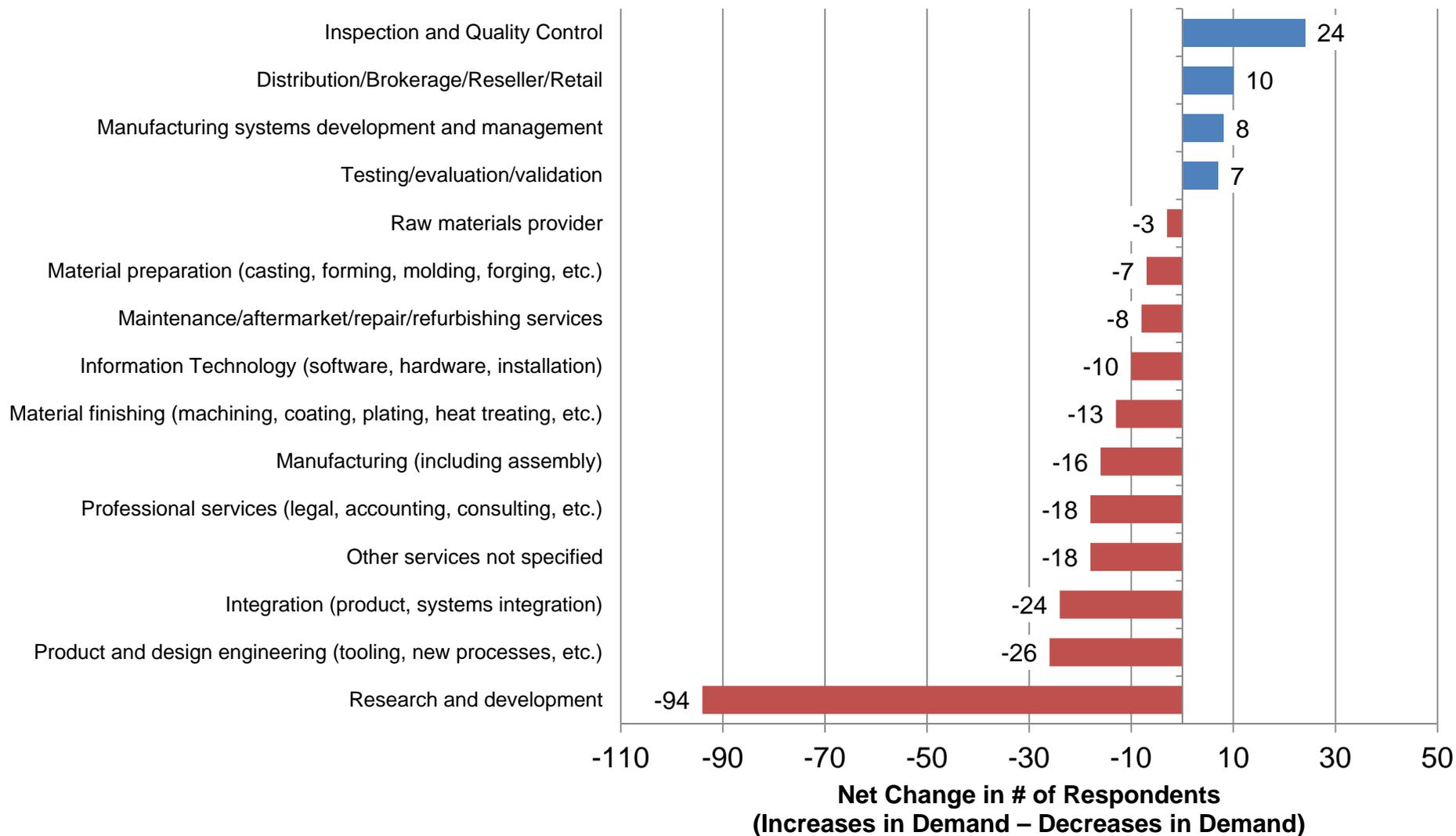
12 respondents were identified as high/severe financial risk.

GPS III respondents support over 236 USG space programs.

Most prominently:

- GOES-R (NOAA)
- AEHF (USAF)
- MUOS (U.S. Navy)
- SBIRS (USAF)
- Other GPS Systems

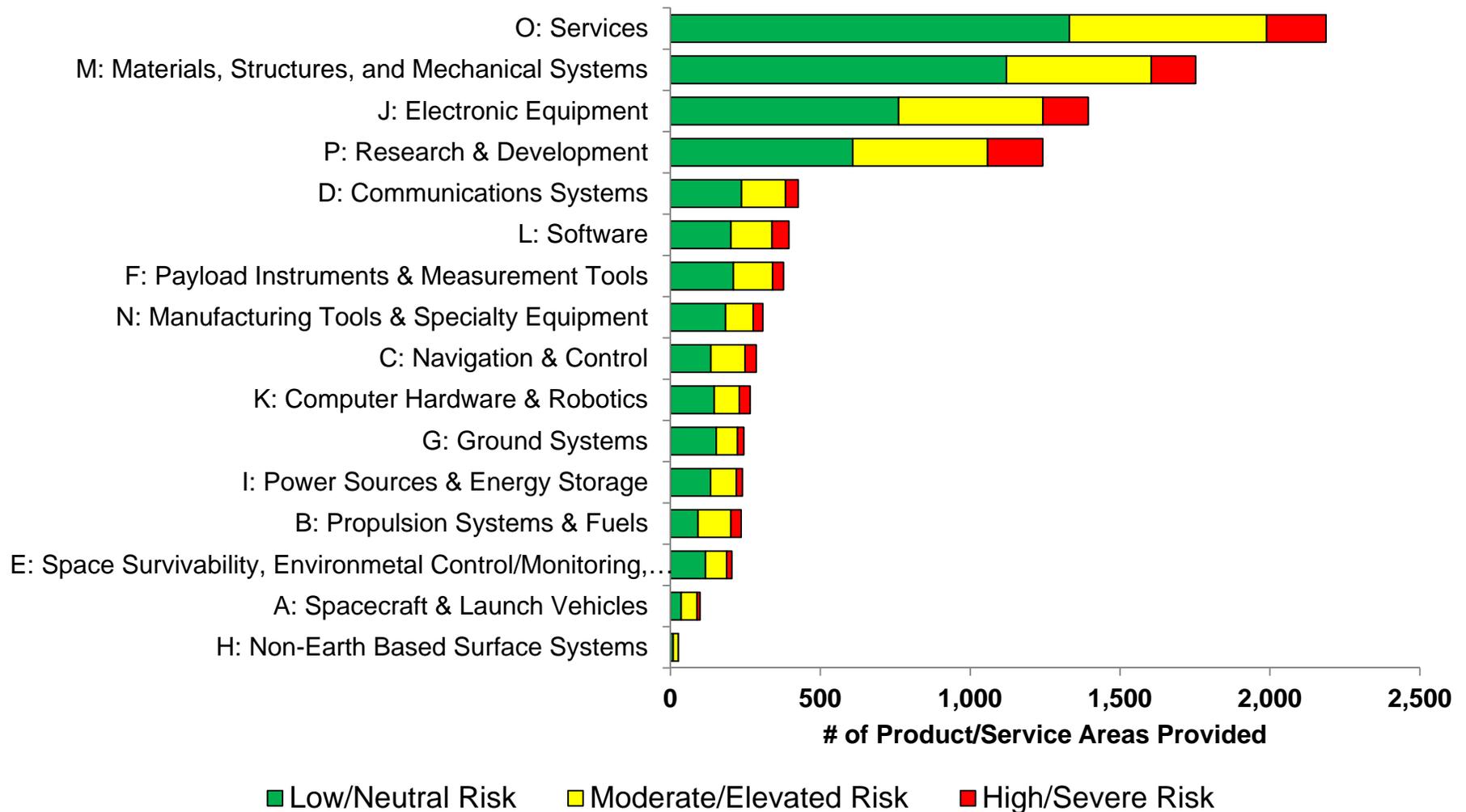
Net Change in Space-Related Customer Demand for Respondents' Business Lines (2009-2012)



Source: U.S. Department of Commerce, Bureau of Industry and Security,
U.S. Space Industry Deep Dive Assessment, February 2014.

Small Business Financial Health

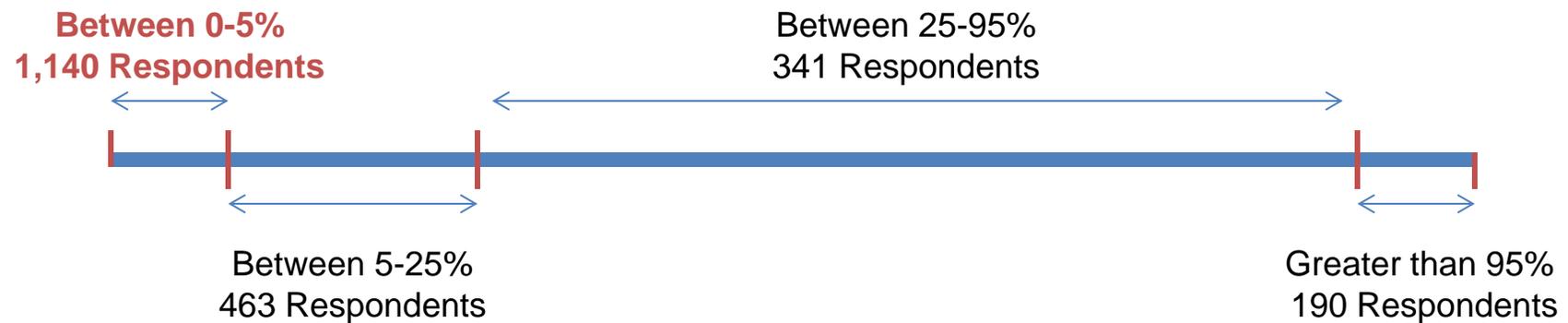
*At Risk Product/Service Areas by Segment**



* Based on 233 high, 692 moderate and 1,388 low risk small business respondents

Source: U.S. Department of Commerce, Bureau of Industry and Security,
U.S. Space Industry Deep Dive Assessment, September 2013.

Exposure to Space-Related Sales*

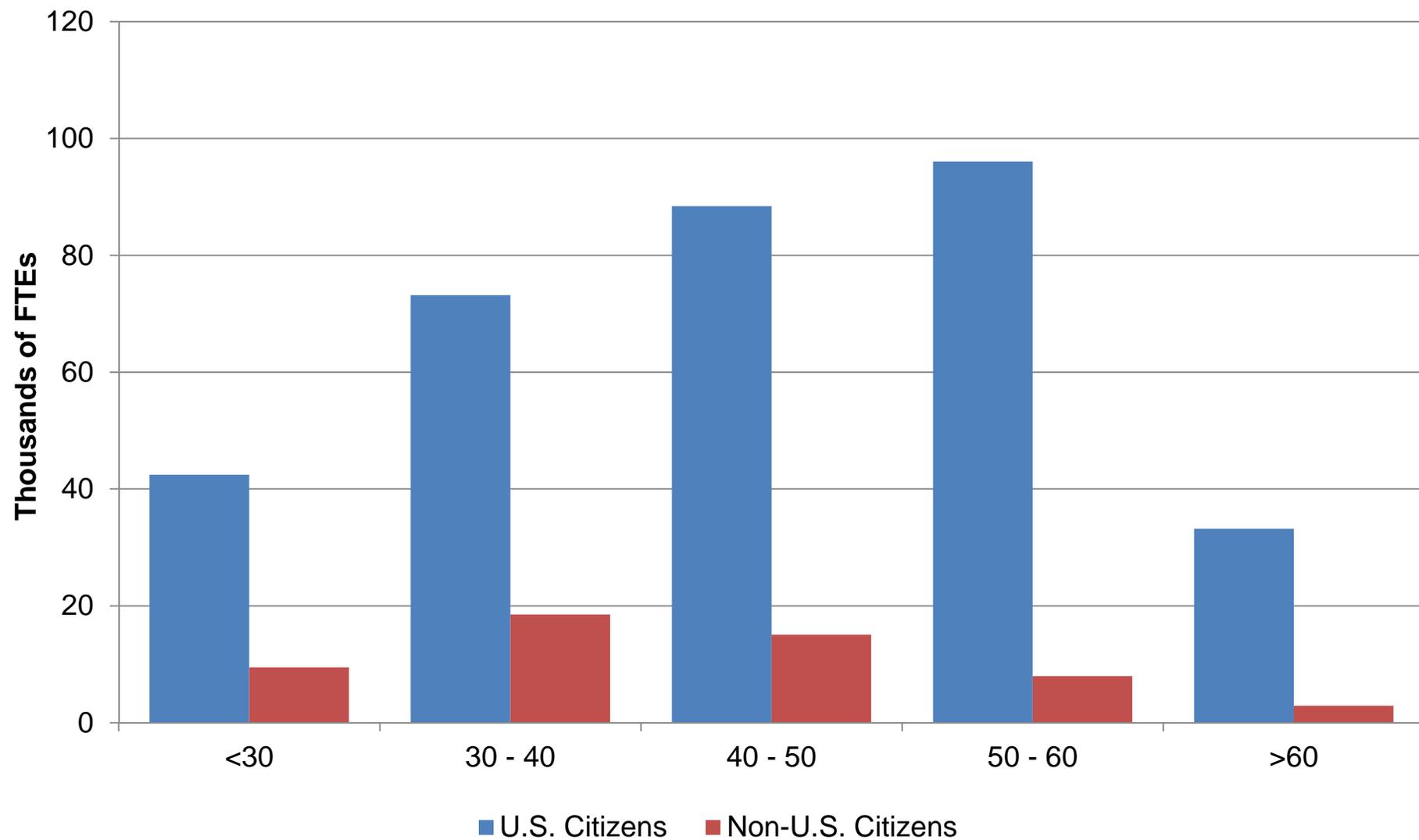


Need to understand the potential impact of USG policy decisions on respondents, space-related or otherwise.

* 1,646 respondents declared that they had no “space-related” sales.

Source: U.S. Department of Commerce, Bureau of Industry and Security,
U.S. Space Industry Deep Dive Assessment, February 2014.

Age Range of Engineers, Scientists, and R&D Staff*



* Excluding universities

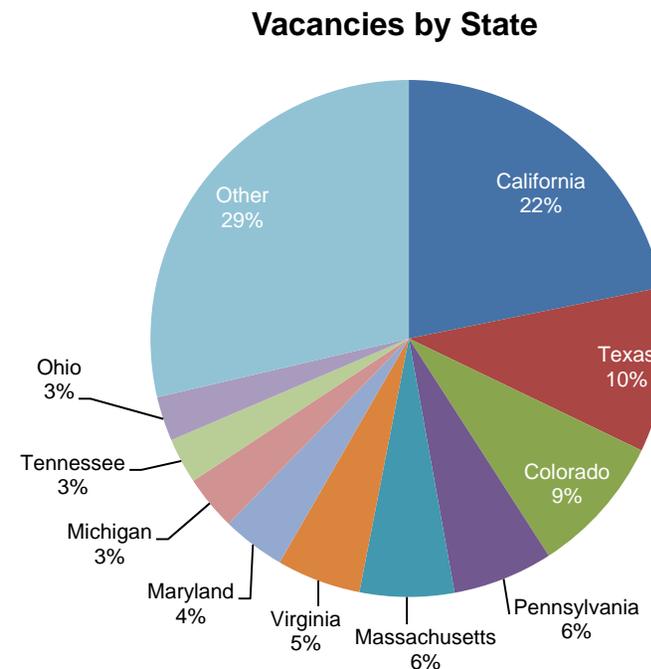
Source: U.S. Department of Commerce, Bureau of Industry and Security,
U.S. Space Industry Deep Dive Assessment, February 2014.

Unfilled Vacancies for Skilled Positions

- Respondents identified how many **unfilled vacancies** they currently have for the following positions:
 - Engineers, Scientists, and R&D Staff
 - Production Line Workers
 - Testing Operators, Quality Control, & Support Technicians
- 1,234 respondents (33 percent) **currently have 24,836 vacancies** for these positions.

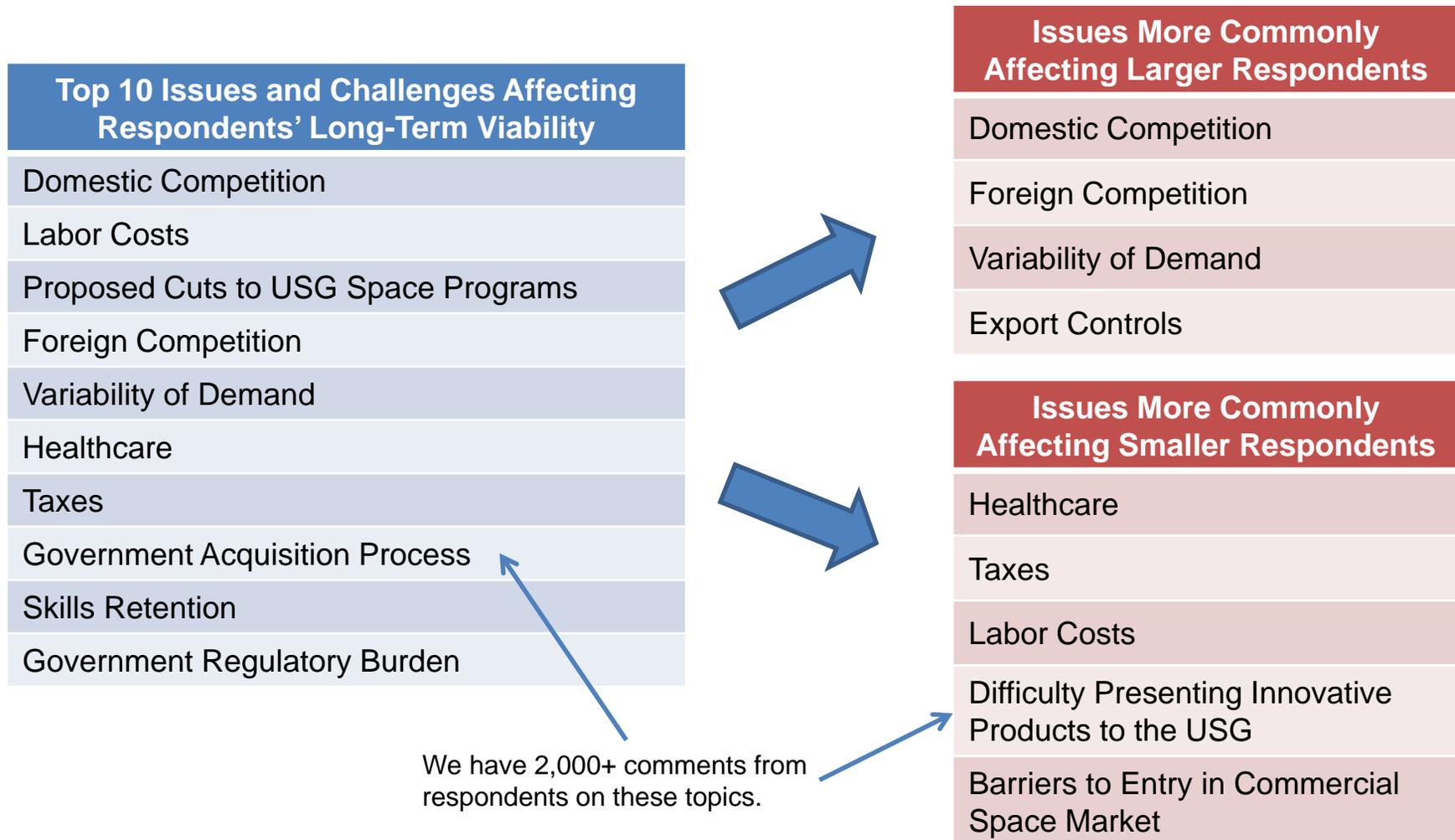
Why are these vacancies unfilled?

1. Lack of proper skills
2. Difficulty attracting workers to manufacturing
3. Geographic difficulties
4. Instability of demand



Source: U.S. Department of Commerce, Bureau of Industry and Security,
U.S. Space Industry Deep Dive Assessment, February 2014.

Strategic Environment: “Understand the Collective Problem”

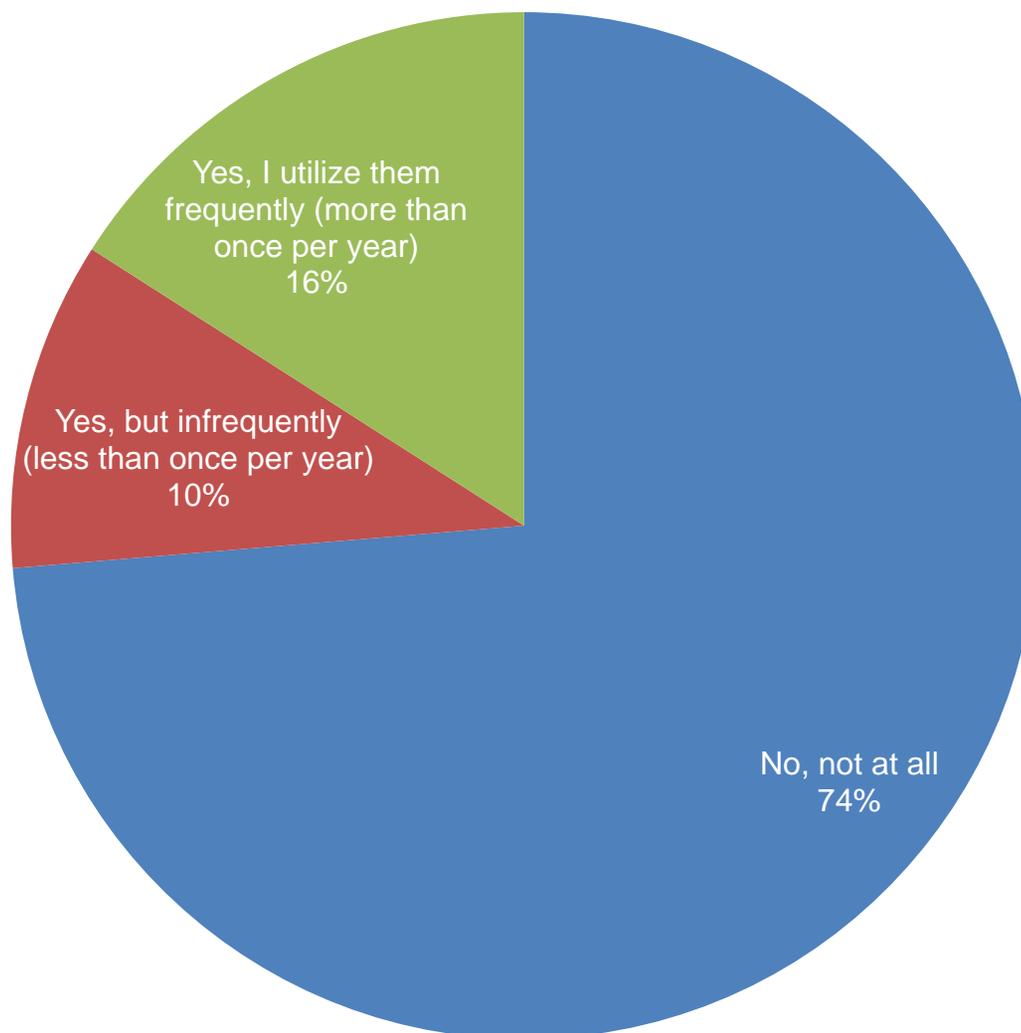


Source: U.S. Department of Commerce, Bureau of Industry and Security,
U.S. Space Industry Deep Dive Assessment, February 2014.

Use of U.S. Export Control System (ITAR/EAR) for Space-Related Products/Services

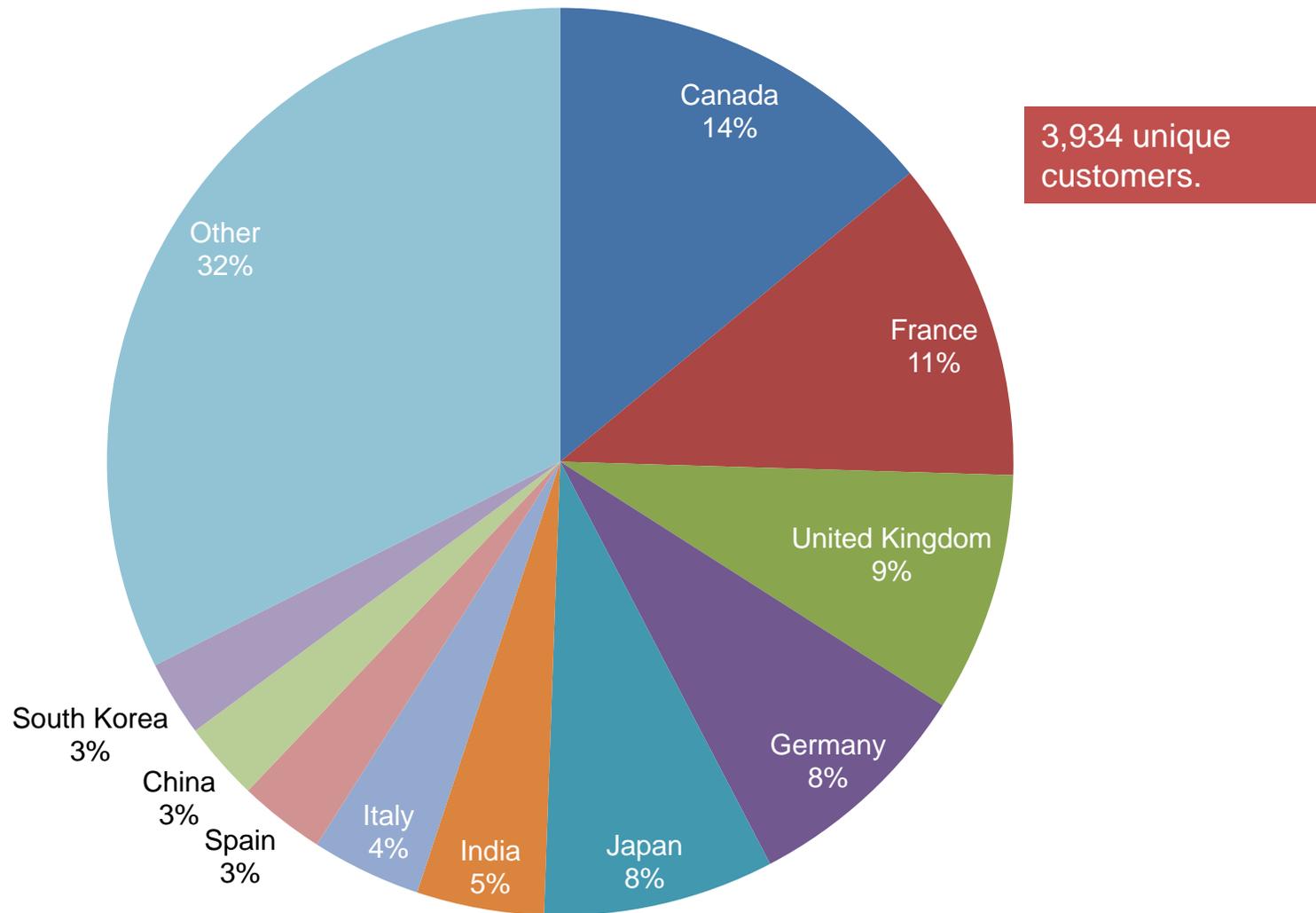
995 respondents utilized the export control system in some form

519 of those respondents are self-identified small businesses



Source: U.S. Department of Commerce, Bureau of Industry and Security, *U.S. Space Industry Deep Dive Assessment*, February 2014.

Location of Non-U.S. Based Space-Related Customers*



* As a percentage of the total number products and services provided.

Source: U.S. Department of Commerce, Bureau of Industry and Security,
U.S. Space Industry Deep Dive Assessment, February 2014.

Potential Impact of Export Control Reform

- Based on proposed regulations, OTE identified 155 product/service areas in the survey that *may* move to the CCL under Export Control Reform
- 1,941 respondents provide at least one of these 155 product/service areas
 - 1,288 of these respondents do not currently utilize the U.S. export control system for space-related products/services
 - 865 of those 1,288 respondents are small businesses

Respondents Interested in Available USG Assistance Programs and Services

| Program | # of Respondents |
|--|------------------|
| Business development | 715 |
| R&D programs | 527 |
| SBIR and STTR contracts | 492 |
| Global export opportunities | 443 |
| Training Opportunities | 416 |
| Export licensing (ITAR/EAR) | 405 |
| Manufacturing technology development | 395 |
| Financing | 353 |
| Government procurement guidelines and e-commerce | 346 |
| Marketing assessment skills | 329 |
| Product/service development | 314 |
| Energy and environmentally conscious manufacturing | 213 |
| Patents and trademarks | 196 |
| Country Commercial Guides | 60 |

OTE developed/distributed informational fact sheets to over 1,300 respondents

BIS is in process of creating interagency team to address weaknesses in the industrial base.

- NIST's Manufacturing Extension Partnership
- Defense Contract Management Agency
- USAF Office of Small Business
- NASA Space Technology Mission Directorate
- Federal Laboratory Consortium
- State Economic Development Agencies

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- **For further results from this assessment, see:**
www.bis.doc.gov/SpaceDeepDiveResults

