



DoD Research and Engineering Enterprise Strategic Direction

TechAmerica

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Summary



- DoD at a Strategic Crossroads: **Our Challenges**
- DoD adjustments to meet priorities for a **21st Century security environment**
- With funding **decreasing**, the need for Collaboration has **increased**: across the Department, with our industrial base partners and Internationally
- Opportunities for industry/academia to learn about our challenges and provide solutions

Maintaining Tech Superiority is the foundation of the R&E strategy



DoD at Strategic Crossroads



- “Across the services, we will need to carefully reconsider the mix between capacity and capability, between active and reserve forces, between forward-stationed and home-based forces, and between conventional and unconventional warfighting capabilities.”

Secretary Hagel
Budget Roll-Out Brief
24 Feb 2014

- “In some cases we will make a shift, for example, by ***prioritizing a smaller, modern, and capable military over a larger force with older equipment.***”



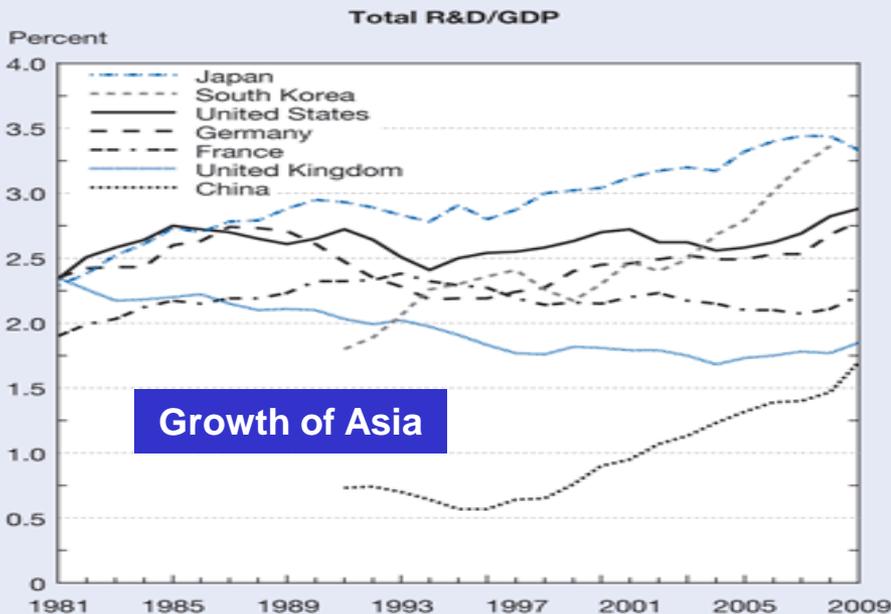
Globalization of Technology

Technological Progress Directly Proportional to R&D



Global R&D funding is changing rapidly

Figure 4-16
Gross expenditures on R&D as share of gross domestic product, for selected countries: 1981-2009



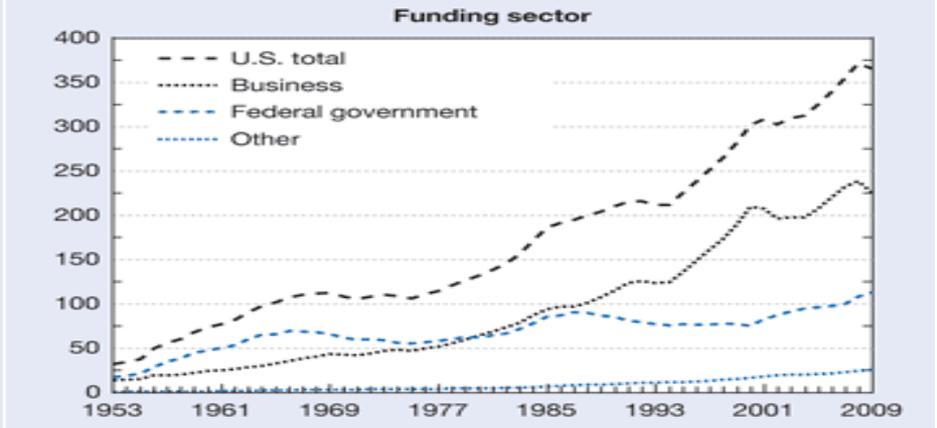
Growth of Asia

GDP = gross domestic product

NOTES: Top seven R&D performing countries. Data not available for all countries for all years. Figures for the United States reflect international standards for calculating gross expenditures on R&D, which differ slightly from the NSF protocol for tallying U.S. total R&D. Data for Japan, for 1996 onward, may not be consistent with earlier data due to changes in methodology.

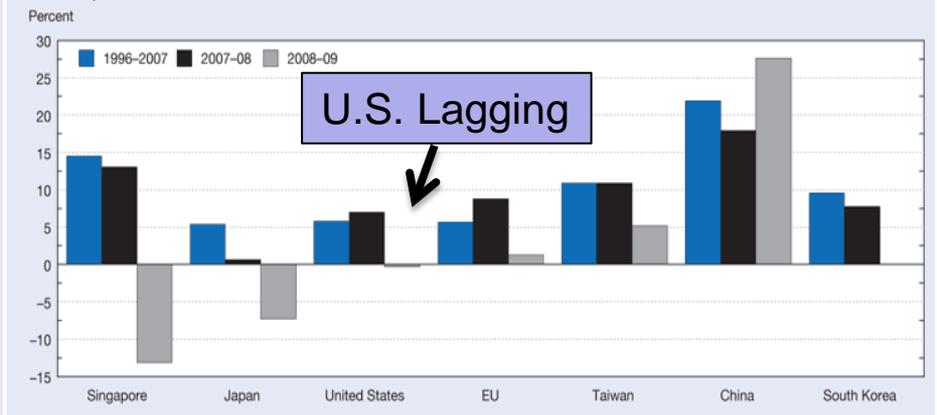
SOURCE: Organisation for Economic Co-operation and Development, Main Science and Technology Indicators (2011/1). See appendix table 4-43.

Science and Engineering Indicators 2012



Decline of Federal Spending, increase in Commercial

Average annual growth of R&D expenditures for United States, EU, and selected Asian economies: 1996-2007, 2007-08, and 2008-09



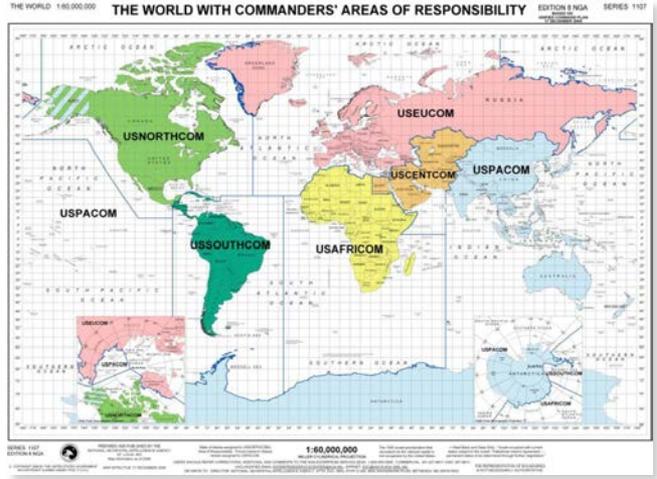
These changes will affect our future



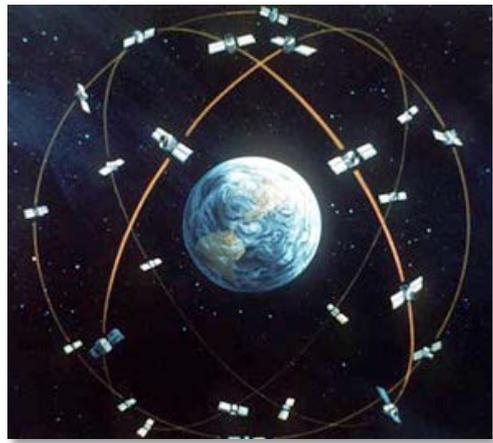
Rise of the “Commons”



Electronic Warfare



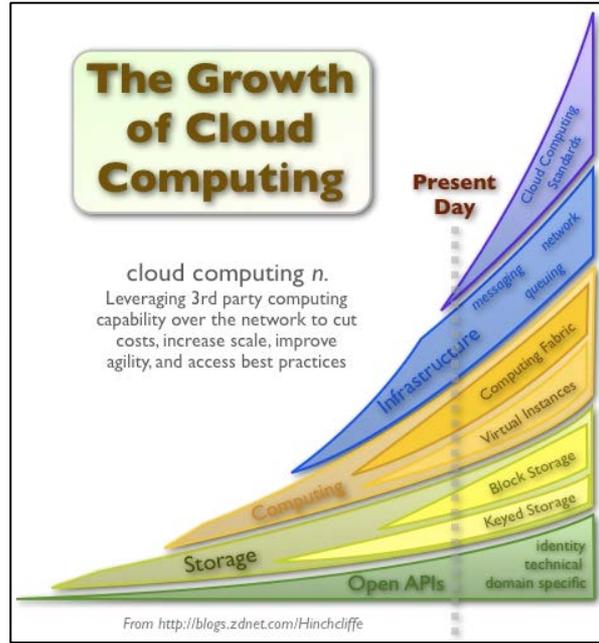
Oceans



Space



Cyber



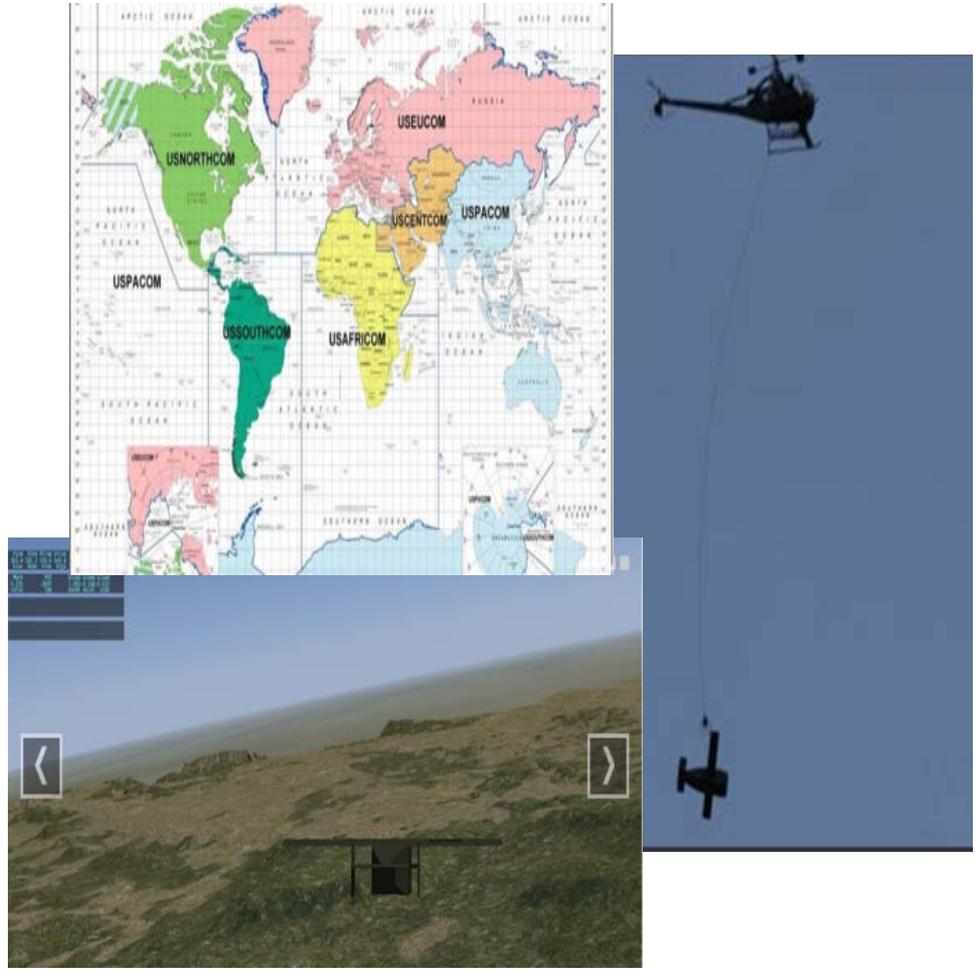
Ubiquitous Data

Military Operations Increasingly Depend on Being Able to Operate in Places “No One Owns” – *The Enablers*



Current Challenges

- For Anti-Access and Area Denial (A2/AD), the ability to globally project power depends on:
- C4ISR
- Space
- Distributed Logistics
- Reach at ranges that impose cost

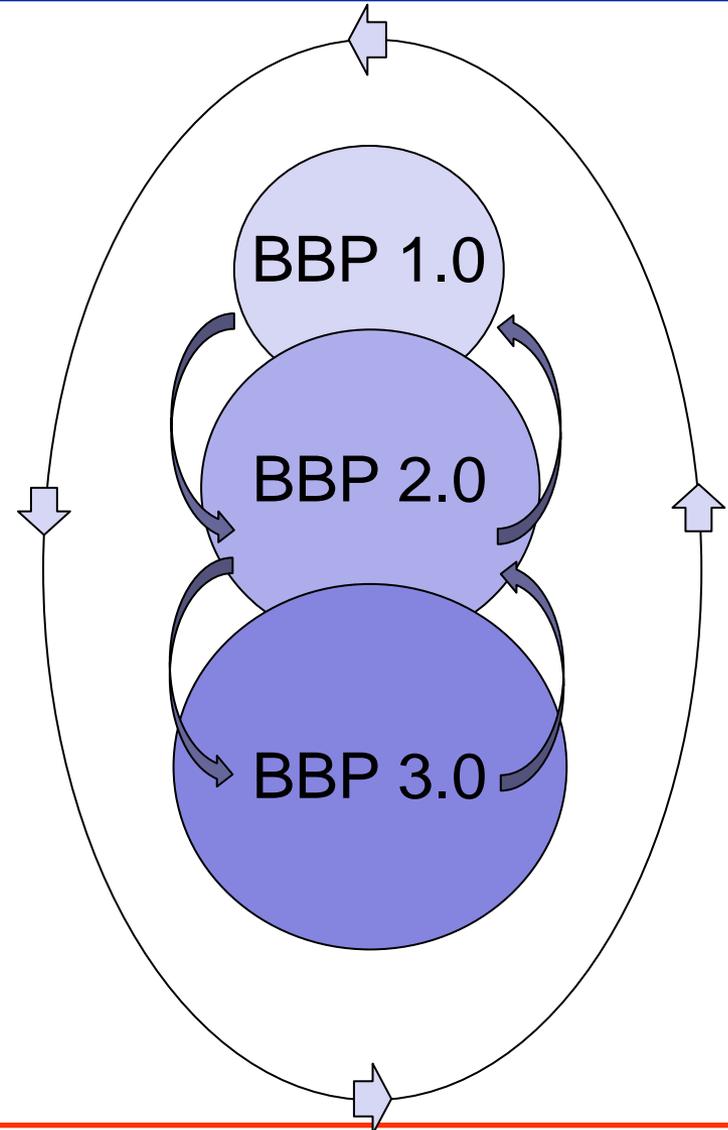




Better Buying Power (BBP) Continuous Improvement Process



- **USD(AT&L) Frank Kendall**
- **BBP 1.0:** Focused on **Best Practices** and Business Rules
 - Affordability, 'Should-Cost', Performance-Based Contracting
- **BBP 2.0:** Focused on **Critical Thinking**, making better business decisions
 - Supplier Incentive Programs, Open Systems Architectures and Risk Reduction
- **BBP 3.0:** Continues and builds upon prior elements – and takes the focus to our Products
 - **Innovation**
 - **Technical Excellence**
 - **Speed to Market**

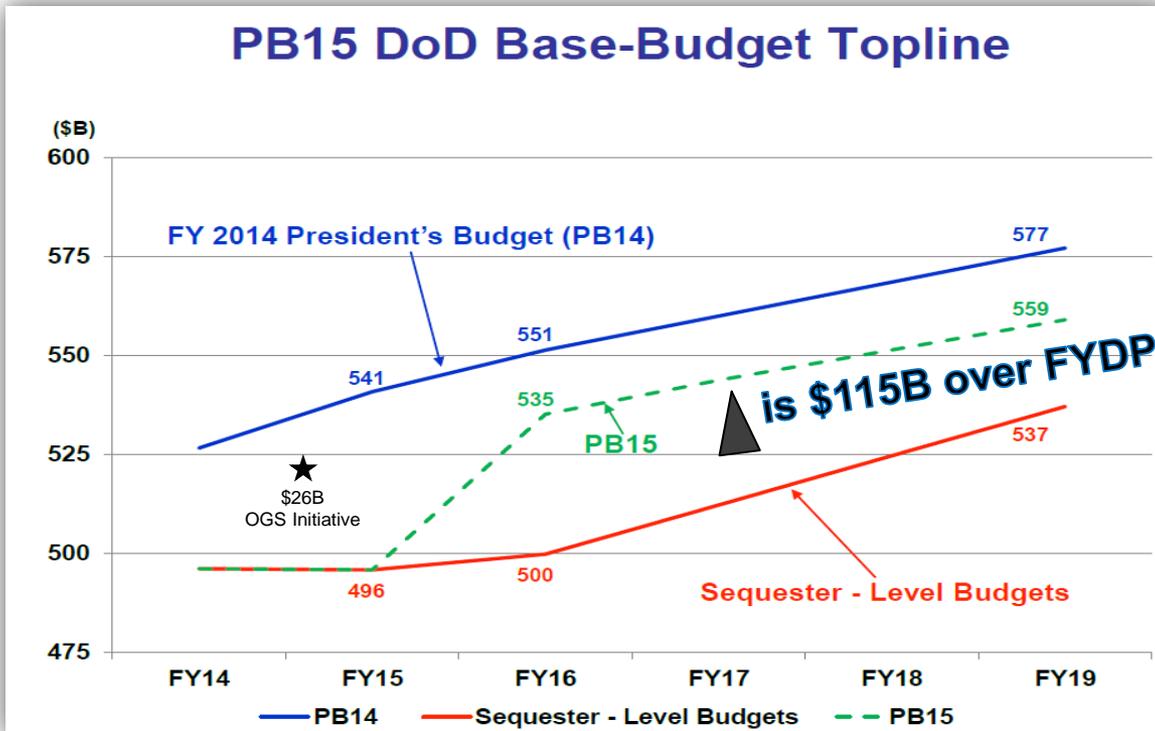




Strategic Future and Fiscal Uncertainty



- If Budget Control Act holds over President's Budget the Department will face reduced capability at sequester-level budgets.
- In FY16-19, the DoD is asking for funding that exceeds the current budget caps by a total of \$115B to meet defense requirements.



3 Budget Levers:

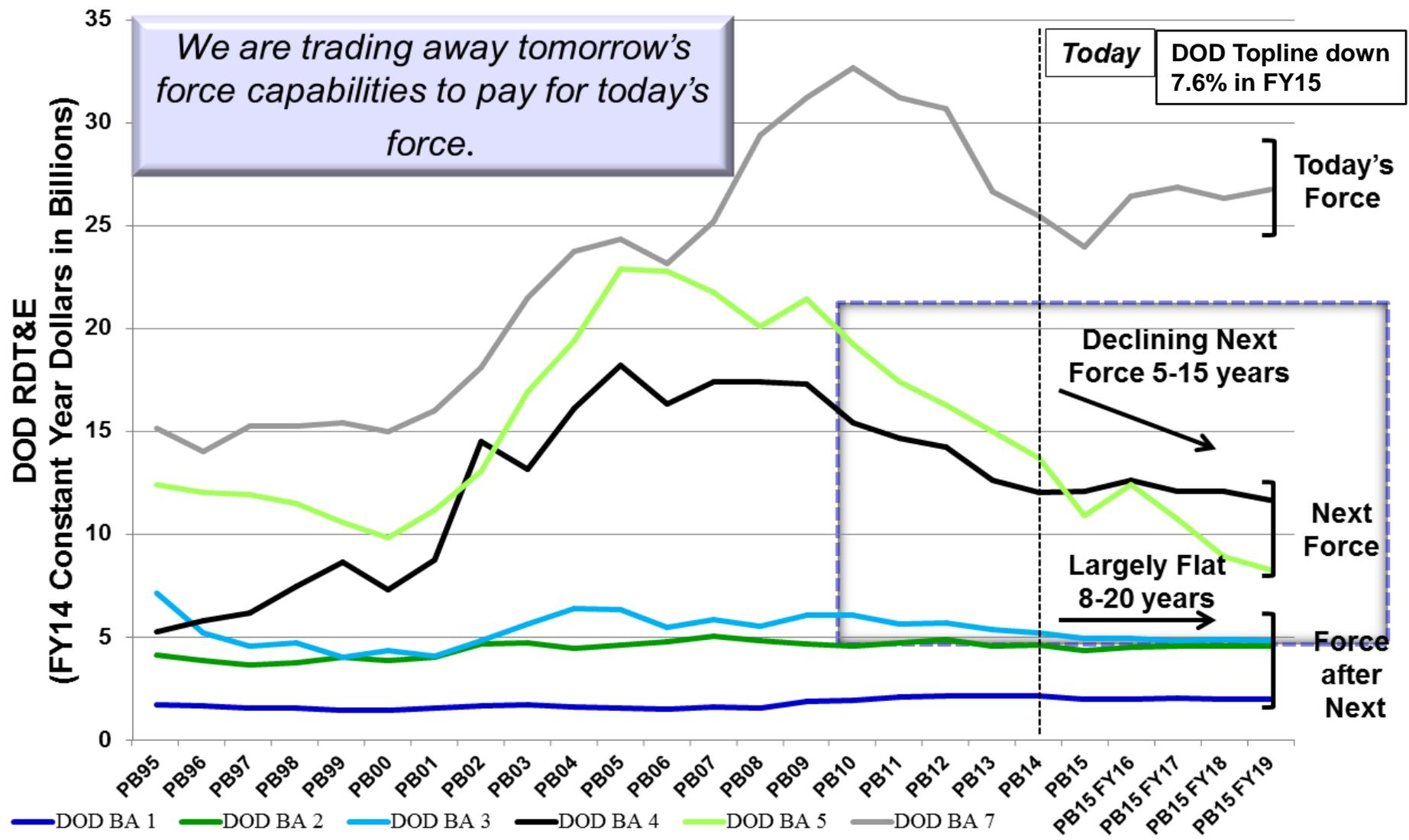
- Force Structure
- Readiness
- Modernization

This gap increases **Risk**

Source: DoD Comptroller / CFO 2015 Budget Request, March 2014, pg 3



DOD RDT&E Budget President's Budget 1995-2015

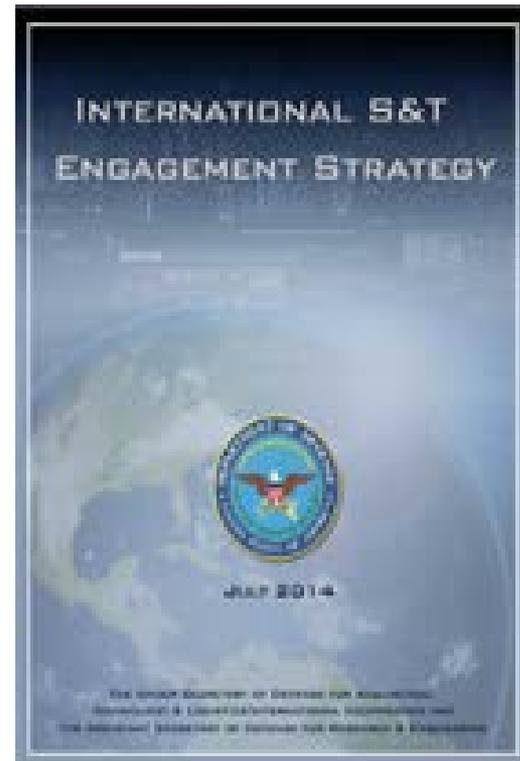
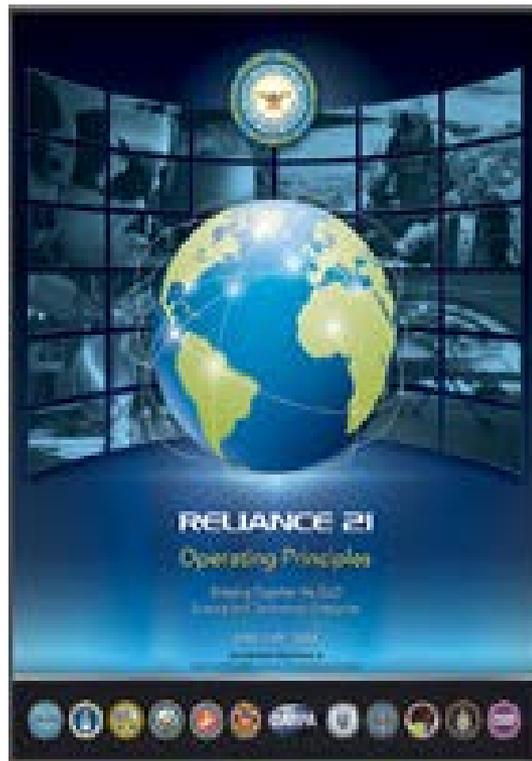
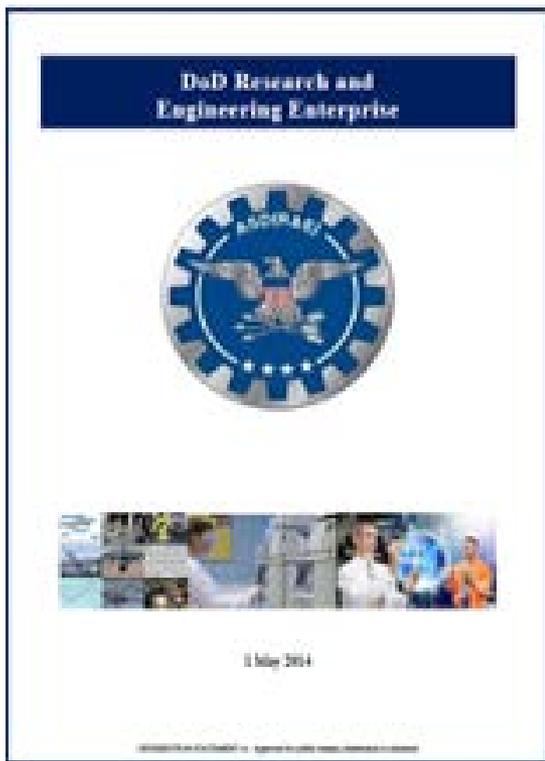




Strategic Guidance



“Our technological superiority is not assured, and in fact it is being challenged very effectively right now.”
-Frank Kendall, USD(AT&L) 19 Sec 2014



Available at www.DefenseInnovationMarketplace.mil



DoD Research & Engineering (R&E) Strategic Guidance

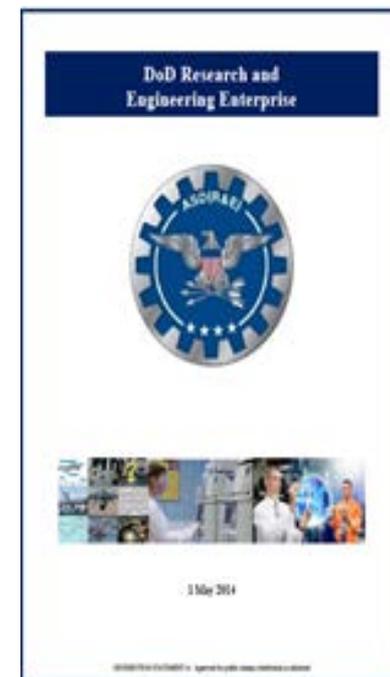


- Provides strategic guidance for DoD components to shape their R&E programs

- Why we do R&D? “*Three Enduring Principles*”:

1. **Mitigate** or eliminate current and emerging threats to national security
2. **Affordably** enable new or extended military capabilities
3. Create **technology surprise** through science and engineering

- Supports the Defense Strategic Guidance, signed January 2012, “*Sustaining U.S. Global Leadership, Priorities for 21st Century Defense*”



Available at [www.defenseinnovationmarketplace.mil/resources/ASD\(R&E\)_Strategic_Guidance_May_2014.pdf](http://www.defenseinnovationmarketplace.mil/resources/ASD(R&E)_Strategic_Guidance_May_2014.pdf)



International S&T Engagement Strategy

A Coordinated & Strategic Approach



- Collaborative effort between ASD(R&E) and AT&L International Cooperation (IC) Directorate
 - Co-signed and released by Mr. Alan Shaffer and Mr. Keith Webster in July 2014
- Developed as **guidance to provide a more coordinated and strategic approach to DoD international S&T collaboration and engagement**

Available at www.defenseinnovationmarketplace.mil/resources/jp3_18.pdf



Current U.S. International R&D Relationships



Joint Acquisition

Basic Science

Prototyping / Demonstration

Information Exchange

South Korea

Japan

Australia

Singapore

Canada

Joint Experimentation

Taiwan

United Kingdom

Defense Intelligence

France

New Zealand

India



Italy

Germany



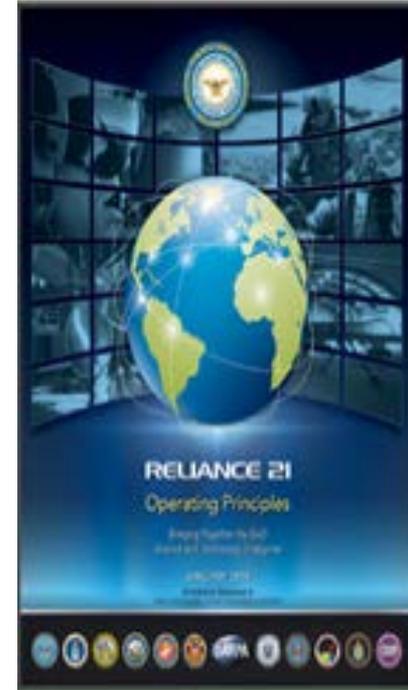


Reliance 21: Operating Principles



- **Operational Framework of the DoD S&T Joint Planning and Coordination process (Updated January 2014)**

- Executes the DoD R&E Strategies
- Portfolio Management infrastructure to enable:
 - Information sharing
 - Alignment of effort against capability gaps
 - Coordination of priorities and investments
 - Exploit synergies and develop new opportunities
 - Support for scientists and engineers across the DoD R&E Enterprise
- Communities of Interest (COI)
 - 17 **cross-domain** technical areas, each with their own Steering Group Lead and multiple technical 'challenge areas' or sub-groups, staffed with Subject Matter Experts (SMEs)
 - Specific cross-cutting technology areas where there is substantial investment **across multiple Components**



Available at www.defenseinnovationmarketplace.mil/resources/2014-Reliance21OperatingPrinciples.pdf

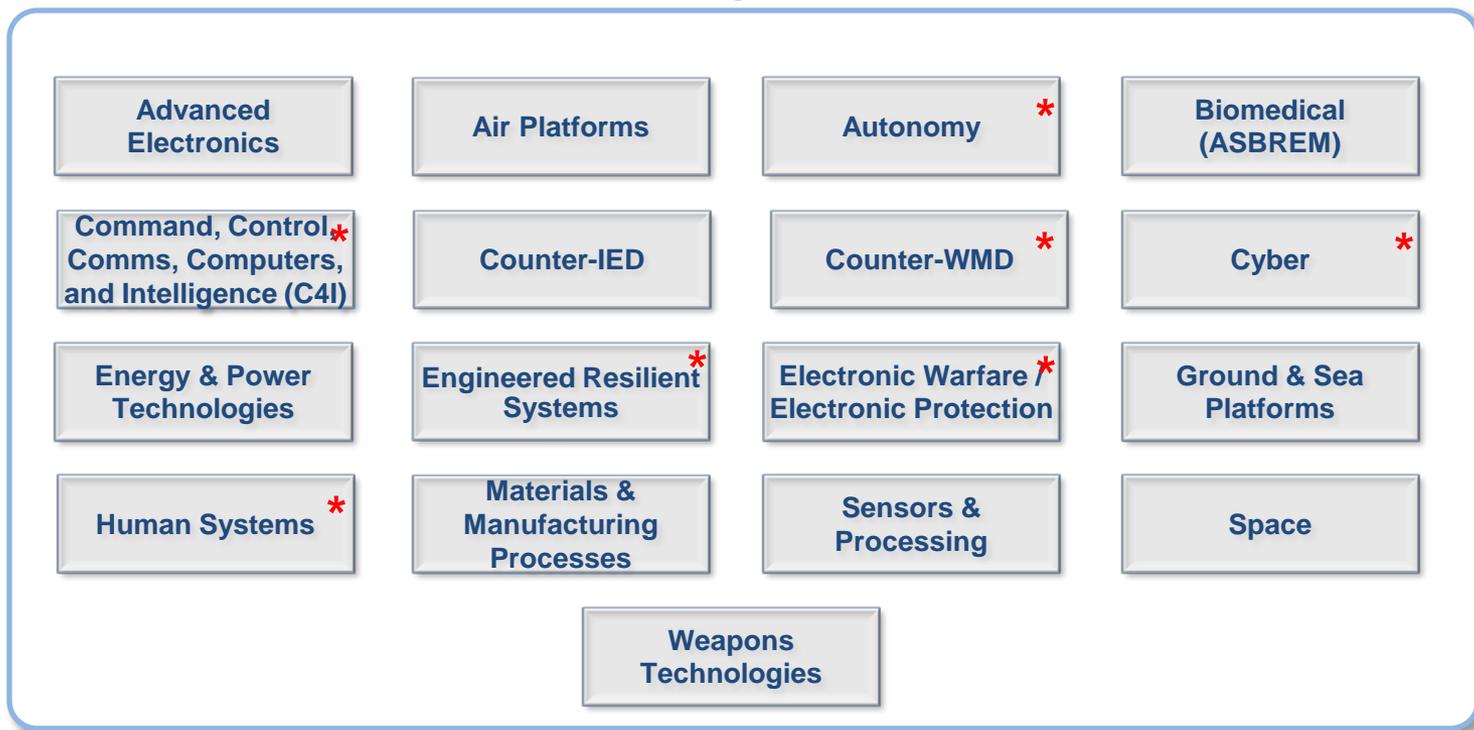


DoD Engagement Strategy



Mission

Leverage **global commercial and non-commercial research and development (R&D)** to ensure superior and affordable development in areas critical to defense, including but not limited to:



* Denotes DoD cross-cutting S&T Priorities (Data-to Decisions is found in C4I)



COI Technology Roadmaps



Strategic outlook, 10 to 15 years



- **Investment-grade Technology Roadmaps to identify the technology challenges:**
 - Where do we want the DoD R&E Enterprise R&E participants to invest?
- **Goals and Metrics: What technical plans are in place, and where are the gaps?**
 - When does it need to happen to make a difference?
 - What are recommended approaches to close gaps / deliver capabilities?
- **Motivation: What is military need / impact of meeting these technical needs?**
 - Enable new or extend missions or capability; reduce life-cycle costs, achieve game-changing level of performance
- **Analysis: Where are the opportunities to leverage external investment / expertise?**
 - Technology “Off-Ramps”: Cross-Government, Industry, Academia, and International



Industry Independent Research & Development (IR&D): Why it is important



- **DoD – and industry – benefit from** IR&D efforts to address technical challenges – reduce cost, technical and schedule risk early.
- **IR&D as Market Research:** DoD uses the IR&D Secure Portal to find projects that address, mitigate, or improve a DoD technical challenge – transition to a program of record.
- **Encourages greater contribution to technology** related to future defense systems.
- **Creates technology surprise.**
- **Hedges** against the uncertainties, inflexibilities and short time horizon of defense planning and systems development.
- **Translates new ideas and technologies** into defense capabilities.



DoD-Industry Engagement

The Marketplace: Your DoD S&T/R&D Resource



Defense Innovation Marketplace website is **the key communication resource** between DoD S&T/R&D and Industry/Academia

- DoD R&E Strategic Guidance, Service-specific S&T/R&D priorities, documents, events and solicitations are posted.
- Virtual Technology Interchanges highlight very focused technical challenges; seek industry solutions.
- Industry uses the IR&D Secure Portal to submit project summaries of their efforts.
 - To date, more than 15,000 project summaries have been submitted, by 100 companies.
 - Access to summaries restricted to registered & approved DoD government employees and military personnel with R&E/S&T or acq. responsibilities



www.DefenseInnovationMarketplace.mil



Virtual Technology Interchanges: Specific Technology Challenges for Industry Engagement



Joint Service/Industry Human Systems COI



defenseinnovationmarketplace.mil/humansystems.html

Selection of Projects

Response:

- 44 Companies submitted 206 Projects online

Selection:

- 19 companies selected to brief 43 projects

Secure Video Teleconference was used when Gov't could not attend

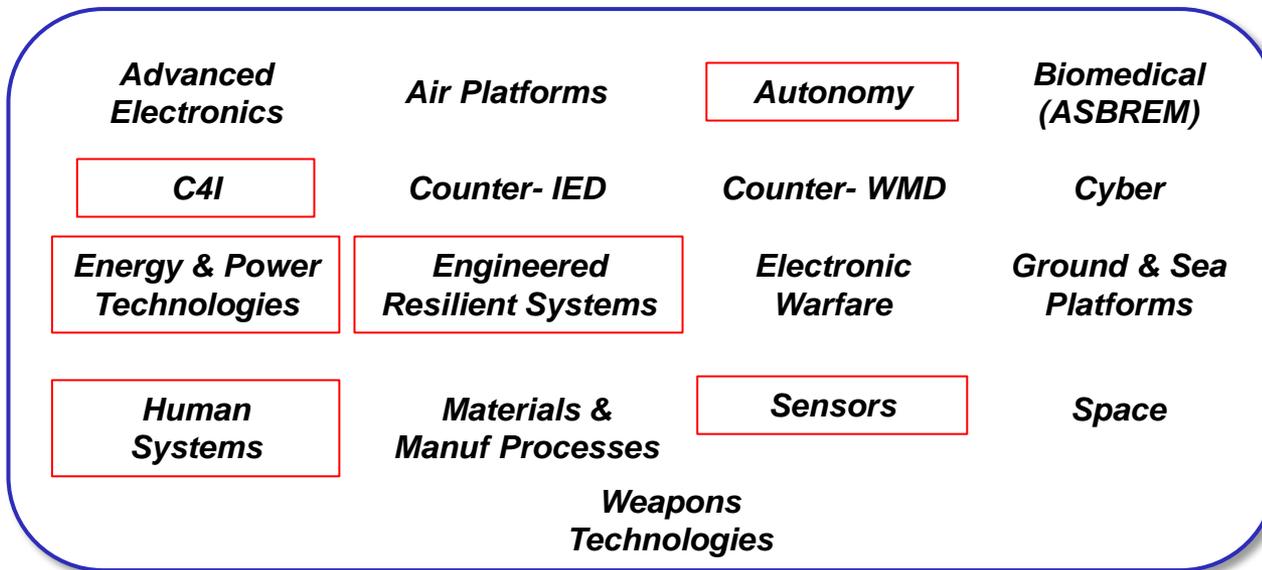
Results/Value

- Good "discovery" mix
- Targeted discussions with industry leaders vs. long briefings
- 6 CRADAs/ partnerships underway
- Proposals in discussion





NDIA Spring 2015 Conference Presentation of COI S&T Roadmaps



COI Roadmaps: An ideal framework to improve engagement with industry

- Industry can use the COI Technology Roadmaps to identify technical challenges
- COIs can use the IR&D Secure Portal to find potential industry solutions

Spring 2015 Event:

- 6 parallel COI sessions for in depth briefing and discussion of challenges & priorities
- 17 Poster Board Displays detailing the Technology Roadmaps
- Break-outs for 1-on-1 sessions with COI Leads



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- **Opportunities for industry/academia** to learn about our challenges and provide solutions



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