



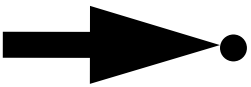
# **Department of Defense Microelectronics Strategy**

**22 March 2011**

**The Honorable Zachary J. Lemnios  
Assistant Secretary of Defense for  
Research and Engineering**



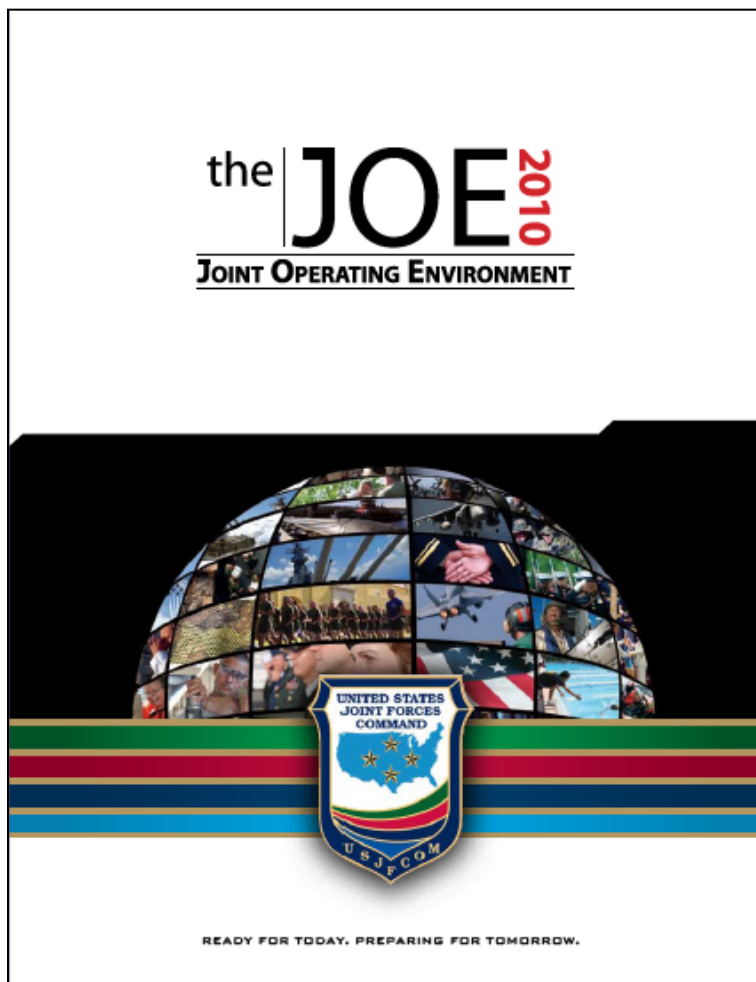
# Outline



- **Operating an a Challenging and Rapidly Changing Environment**
- **Growing Demand for “Trusted Systems”**
- **Transition to an Integrated Research and Engineering Enterprise**



# Global Challenges and Trends



- **Shifting Global Demographics**
- **Globalization shifts**
- **Energy**
- **Climate change & natural disasters**
- **Cyber as a new domain**
- **Challenges to existing state structures**
- **WMD proliferation**



# Corporate Research (circa 1980)



## Corporate R&D Laboratories



**parc**  
A Xerox Company



**ITT**

**TRW**

**MCDONNELL  
DOUGLAS**



**HRL**  
LABORATORIES



**IBM**



**Raytheon**

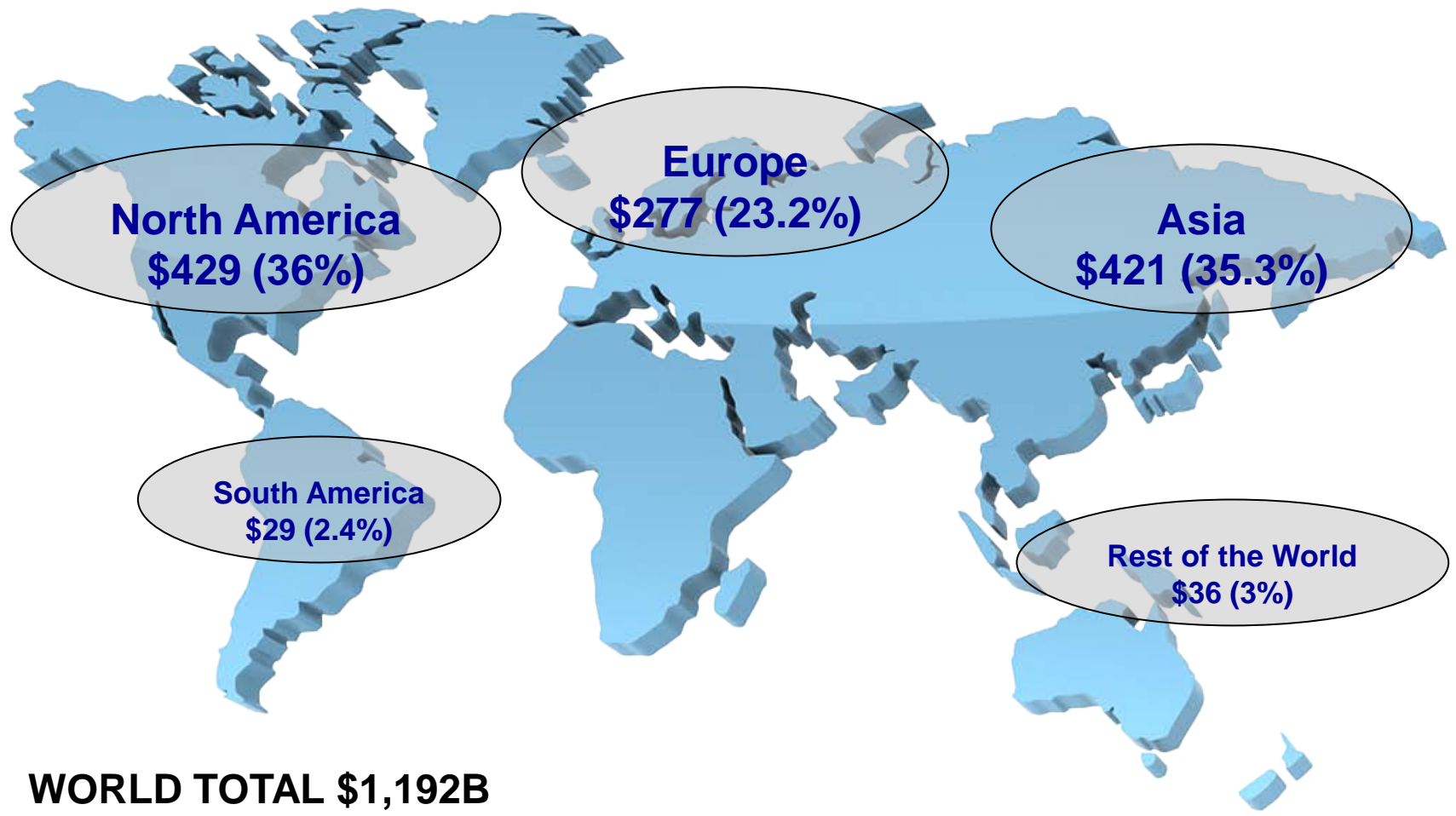


## World class basic research enterprise

- World class talent
- Superb facilities
- Foundational patents
- Seminal publications
- Era of invention



# Globalization of R&D

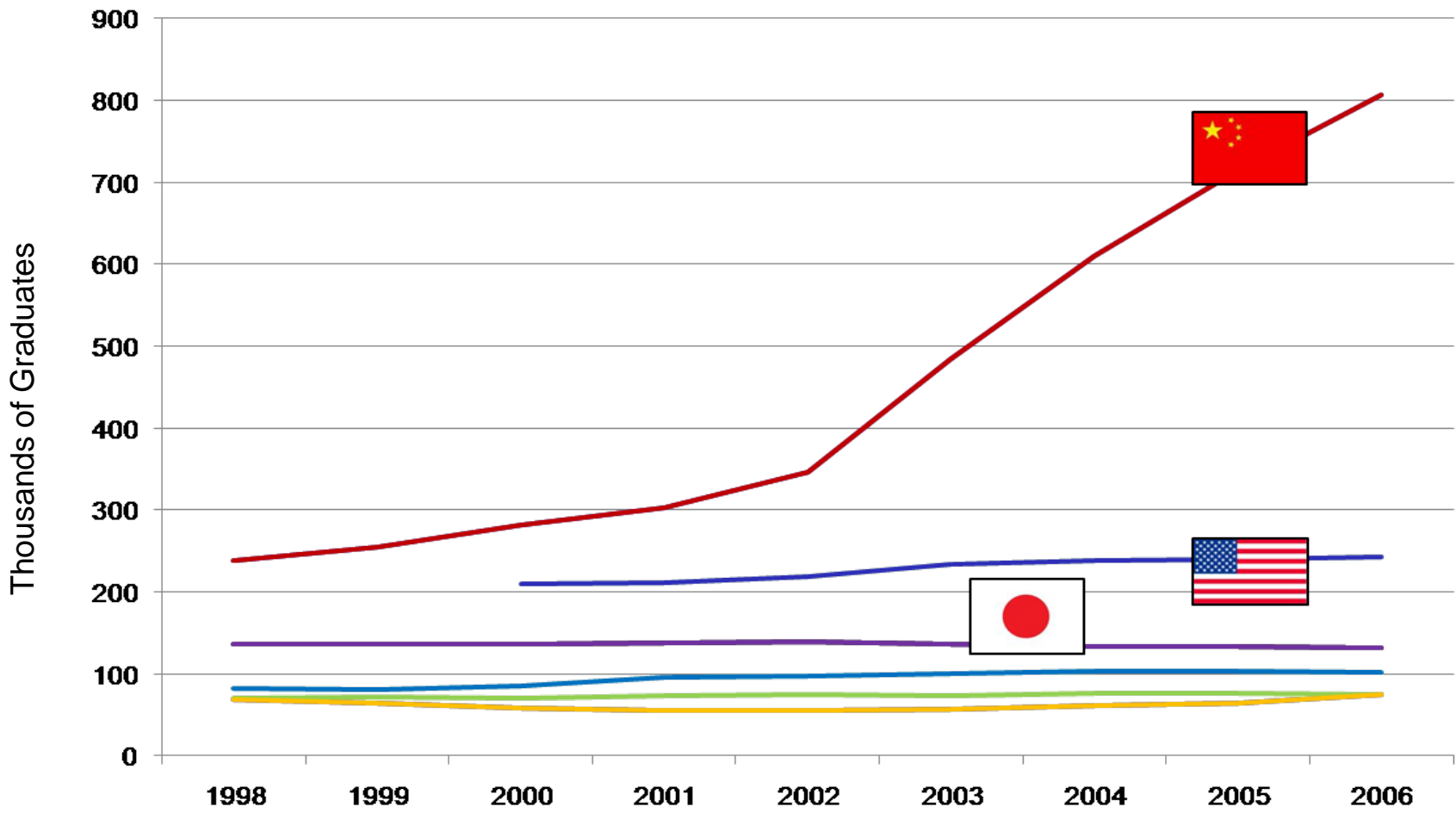


Source: [www.rdmag.com](http://www.rdmag.com) "2011 Global R&D Funding Forecast" - Battelle





# First Degrees in Natural Sciences & Engineering

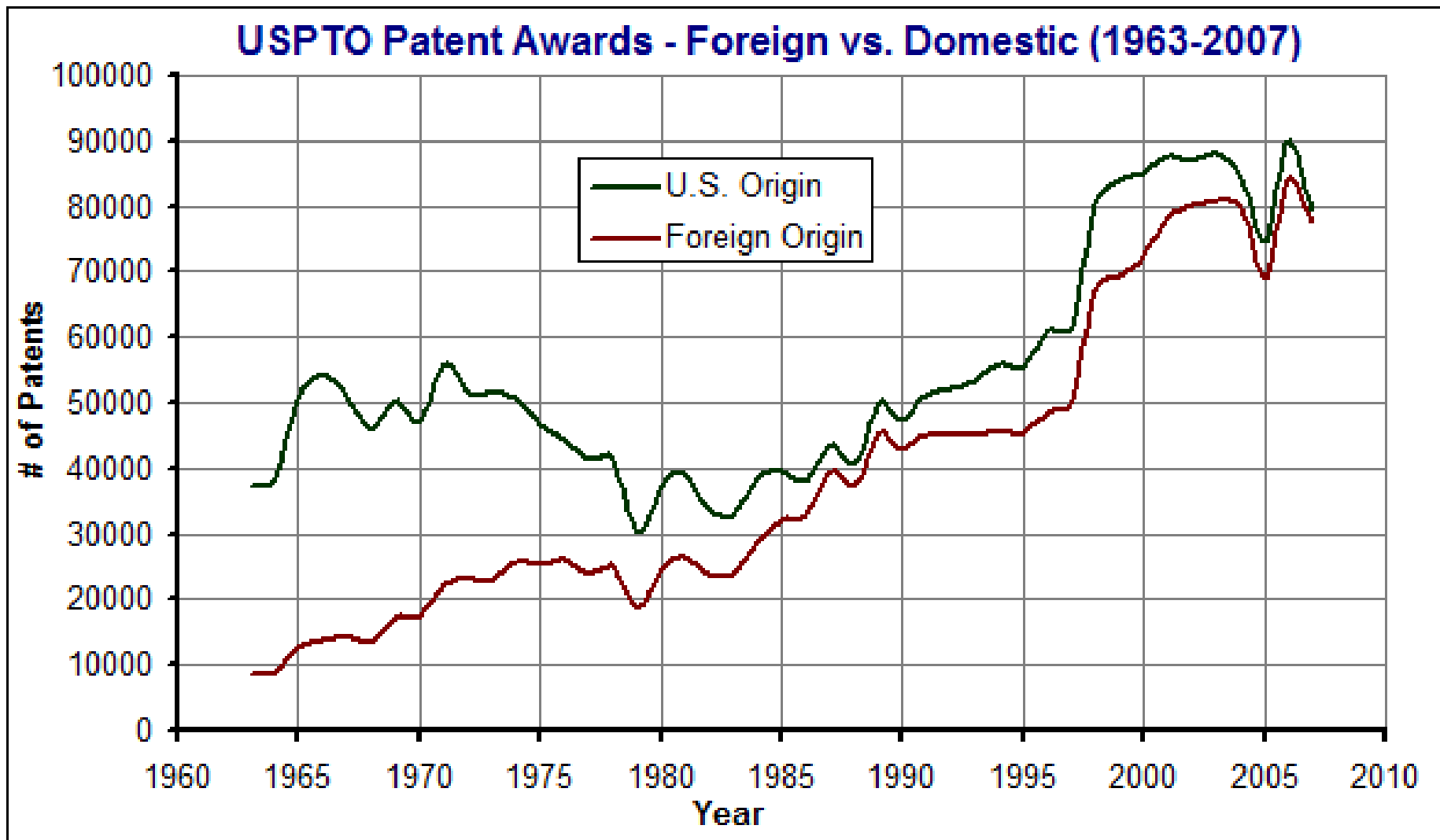


Source: National Science Board, S&E Indicators, 2010





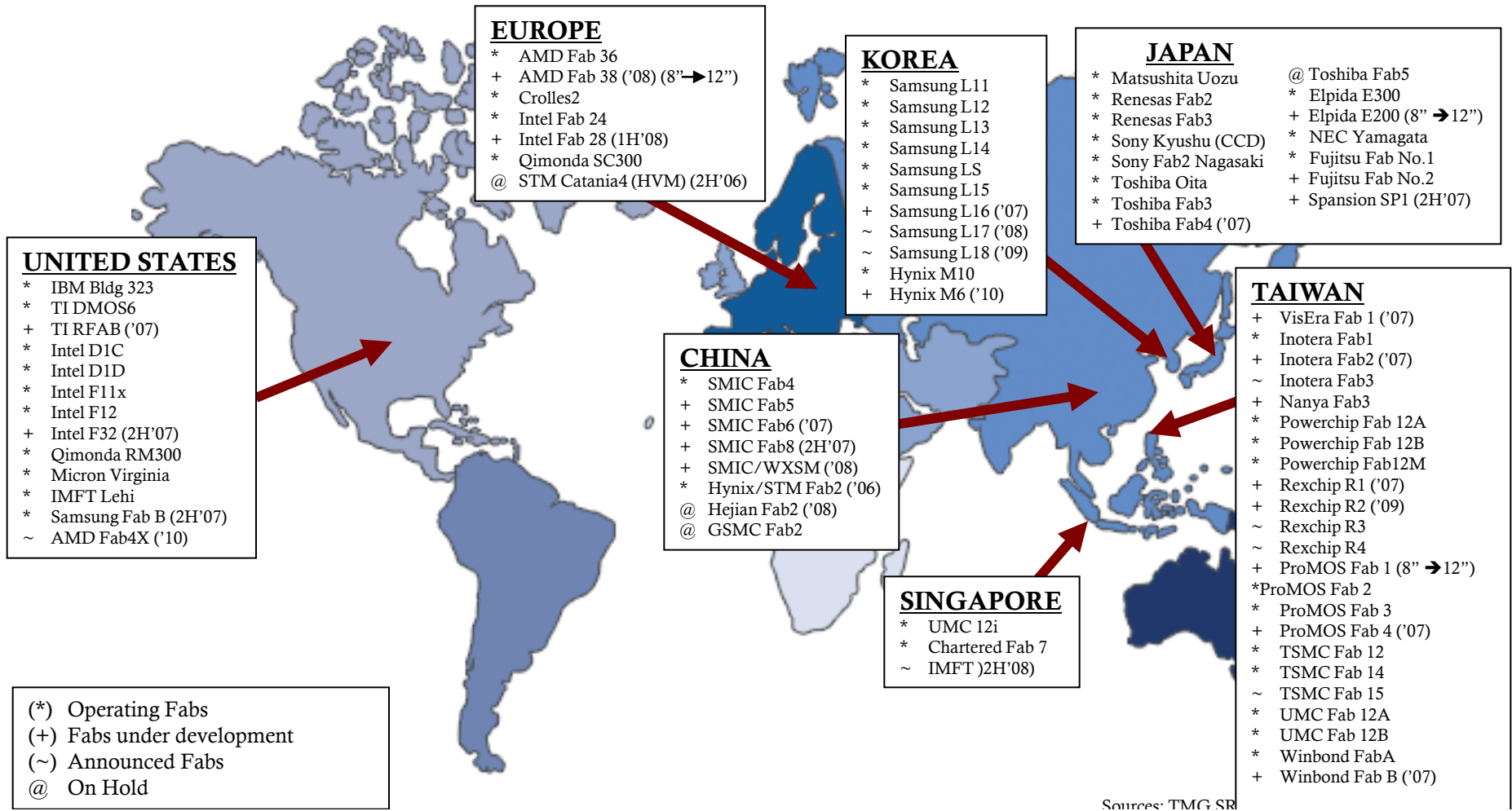
# Global Innovation is increasing







# World's 300mm Fab Capacity and Location



**Leading edge foundry's have migrated to Asia**



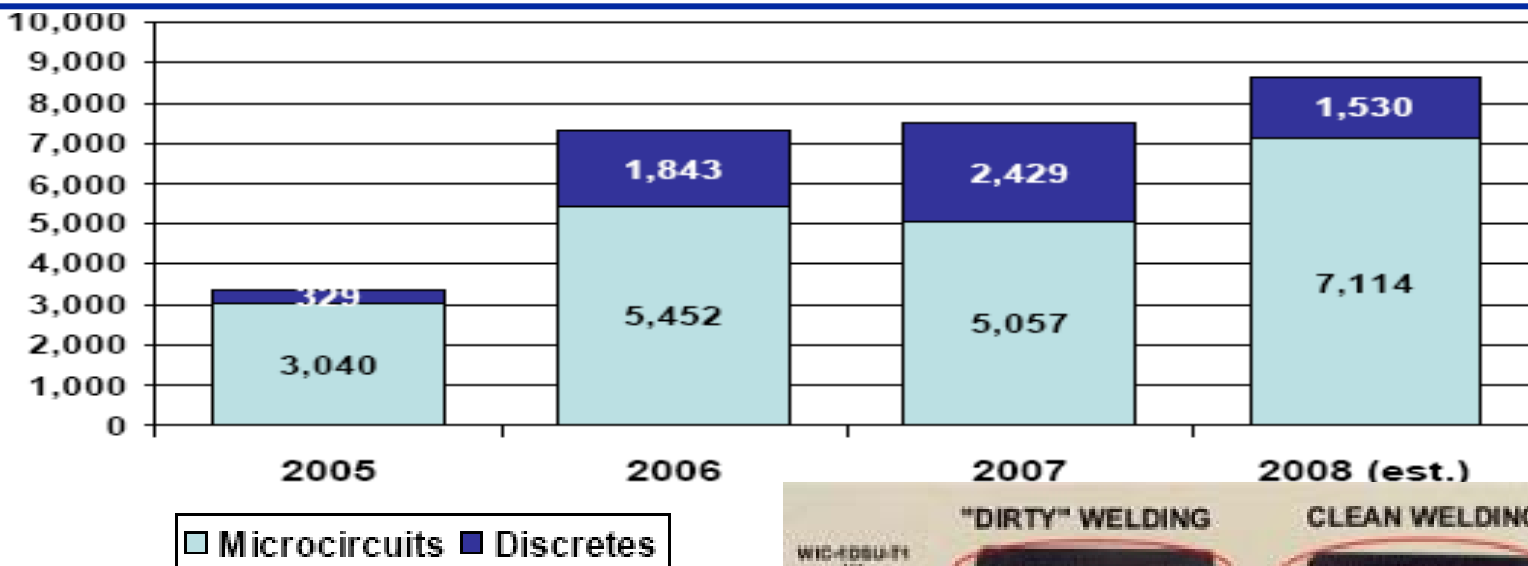
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# Counterfeit Incidents



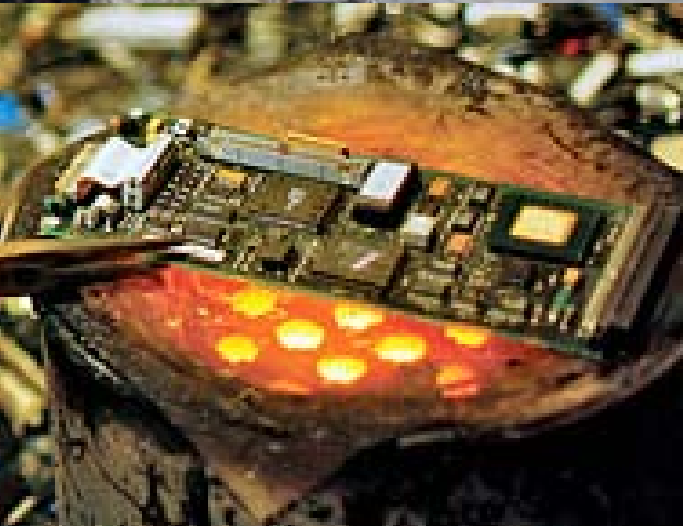
Source: U.S. Department of Commerce, Office of Technology Evaluation, Counterfeit Electronics Survey, November 2009.

**Counterfeit CISCO routers sold to DOD, GSA, defense contractors**





# Global Counterfeit Parts Industry







# Trusted Defense Systems



- **Improve system security through coordination of disciplines**
- **Support current acquisition programs**
- **Advancing the state of practice to scale these activities and increase assurance**



**Uncompromised and secure military systems for the warfighter**



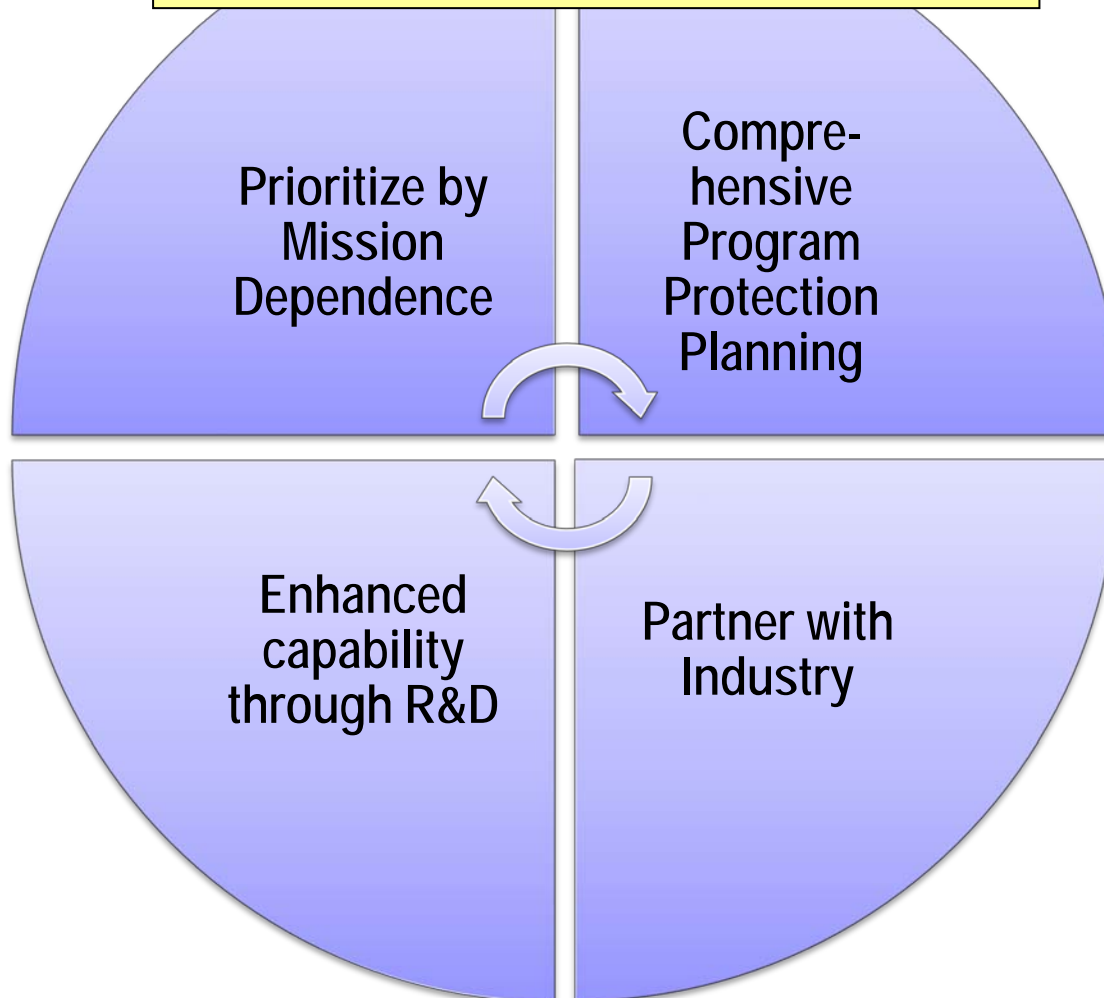
# Trusted Defense Systems Strategy



## Drivers/Enablers

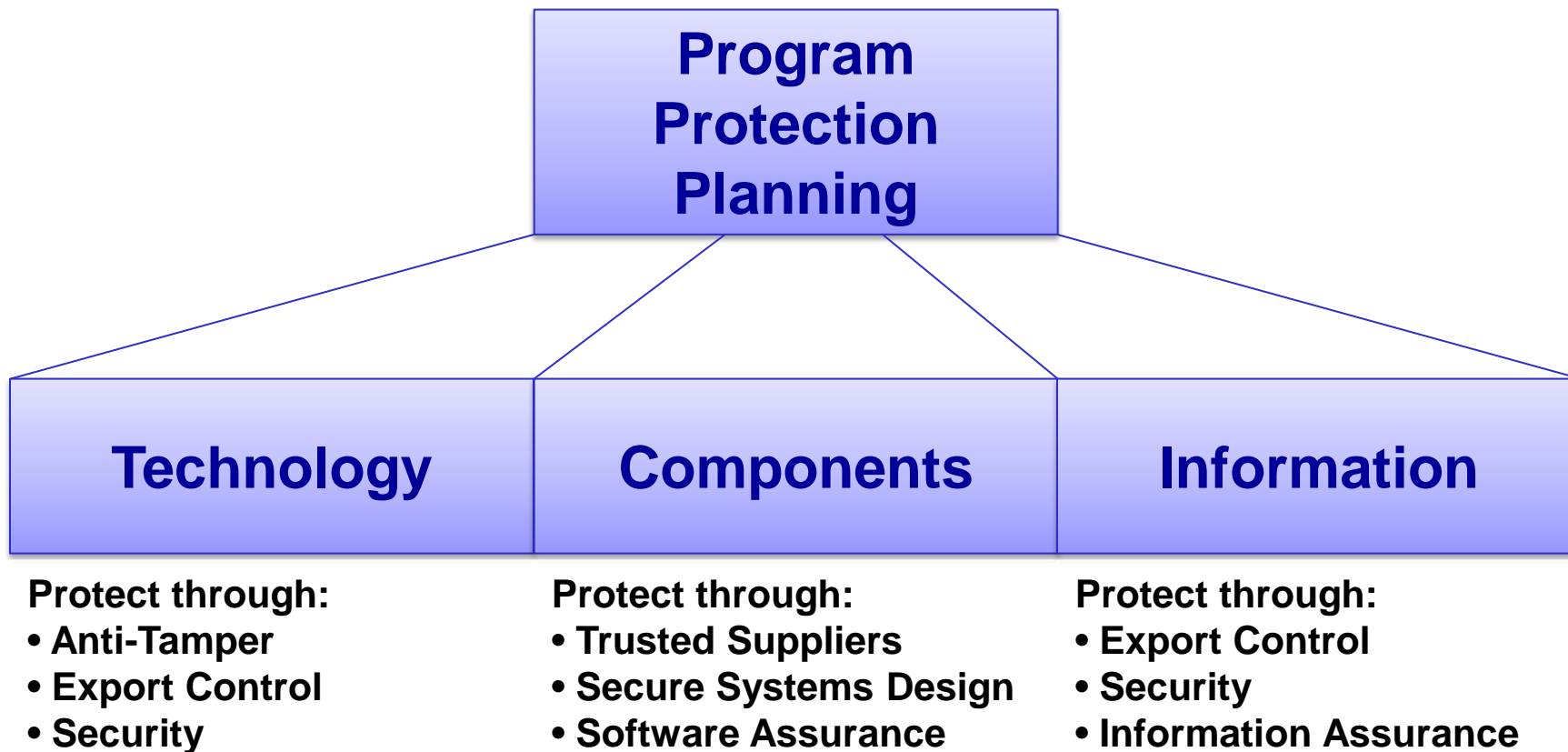
- National Cybersecurity Strategies
- Congressional Interest
- DoD Policy and Directives
- Globalization Challenges
- Increasing System Complexity

## Delivering Trusted Systems





# Program Protection Planning



***Integrating Security and Engineering disciplines is essential to comprehensive system security***





# DOD Microelectronics Supply Chain

Program Protection Planning

System Components

Source critical hardware components from trusted suppliers

DOD Microelectronics Supply Chain

State of the Art

State of the Practice

Legacy

R&D (24nm)

ASICs

FPGAs

Micro-processors

Trusted Supply Chain (DMEA Accredited)





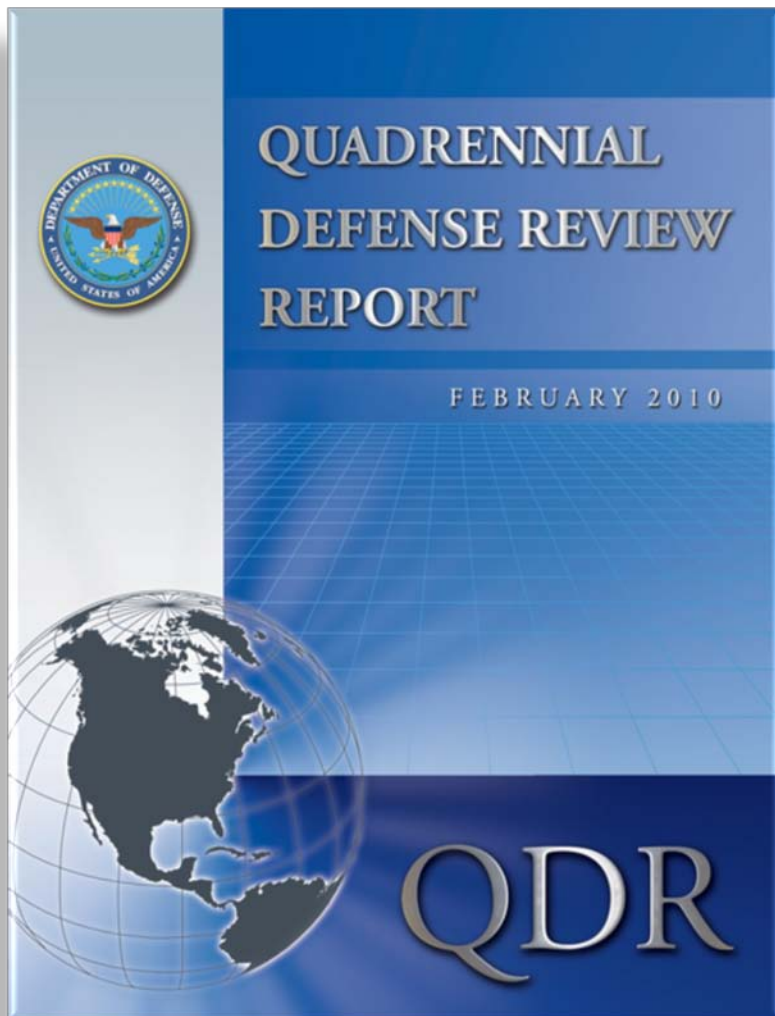
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# Quadrennial Defense Review Missions Require New Capabilities



1. Defend the United States and Support Civil Authorities at Home
2. Succeed in Counterinsurgency, Stability, and Counterterrorist Operations
3. Build the Security Capacity of Partner States
4. Deter and Defeat Aggression in Anti-Access Environments
5. Prevent Proliferation and Counter Weapons of Mass Destruction
6. Operate Effectively in Cyberspace.



# Capability Priorities for FY12-16



## Complex Threats

**Electronic Warfare /  
Electronic Protection**

**Cyber Science and  
Technology**

**Counter Weapons of  
Mass Destruction**

## Force Multipliers

**Data-to-Decisions**

**Autonomy**

**Engineered Resilient  
Systems**

**Human Systems**



# Innovation Model

## *Operational Users Community*

**Academia**

**Labs  
FFRDCs,  
UARCs**

**Industrial Base  
(IR&D / CR&D)**

**SBIR**

## *Requirements & Acquisition Community*

**Incentives and Processes to Create A Tightly-Coupled Community**



# Summary



- **Depending solely on COTS is too risky for DoD.**
- **Trusted systems acquisition will drive need for trusted components, demand will ramp.**
- **Trusted systems design methods will provide options, enable globally sourced components**
- **DoD's support for Science, Technology, Engineering, and Math will create a large diverse pool of talent for DoD and contractor community.**