The Future Is Not What It Used To Be

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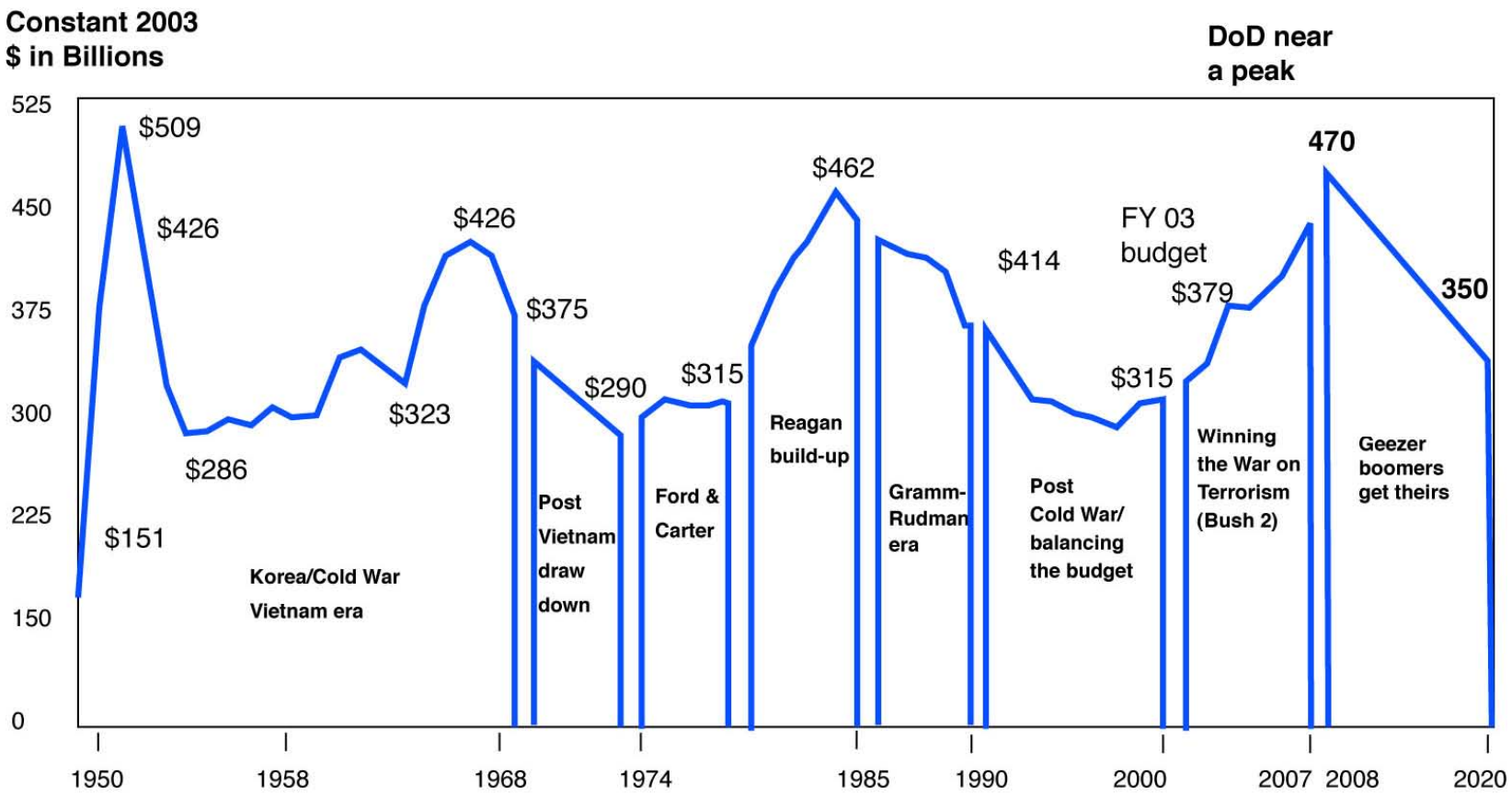
DoD budget authority cycles



DoD funding has a 20-year cycle

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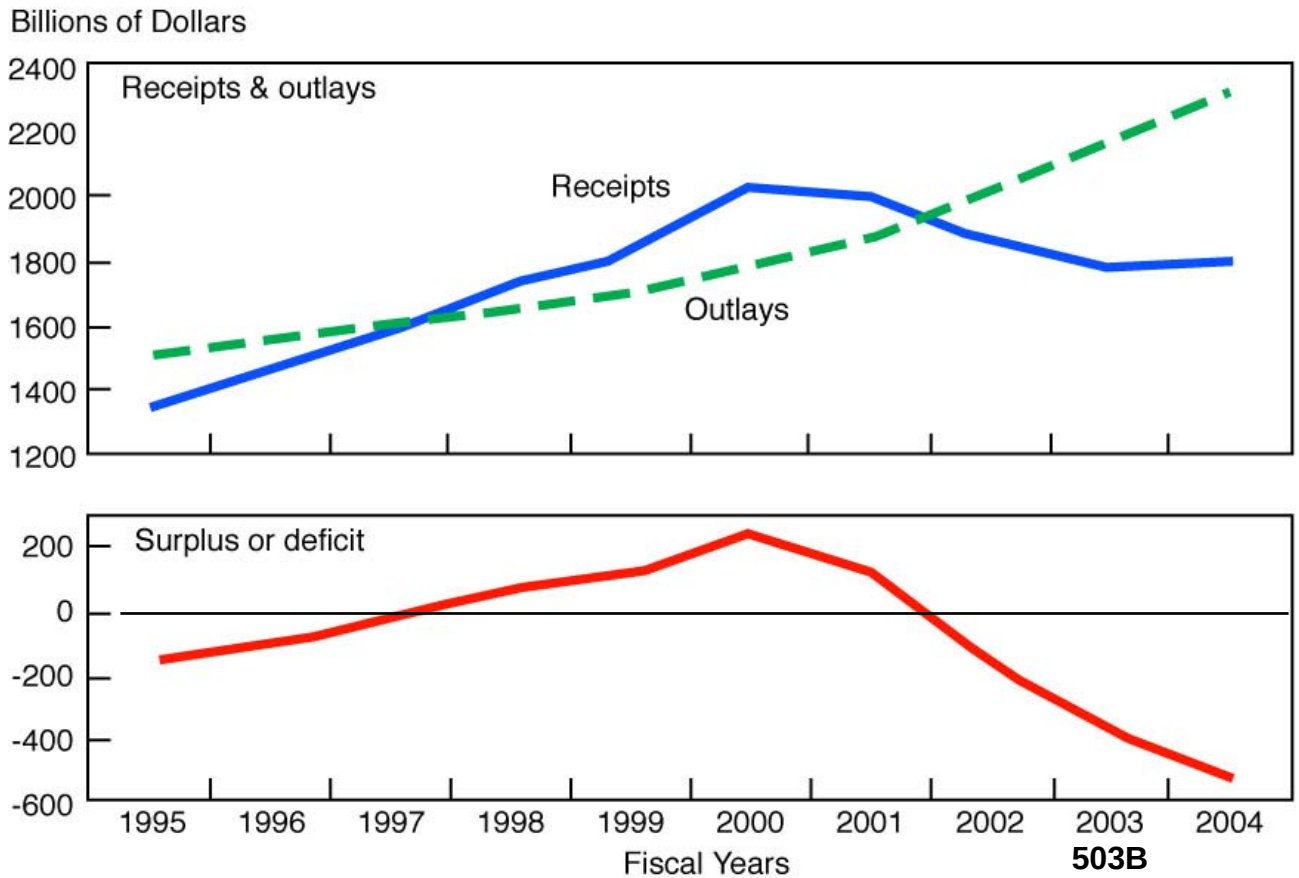
Deficit is high and growing



Sources: Department of Treasury & OMB

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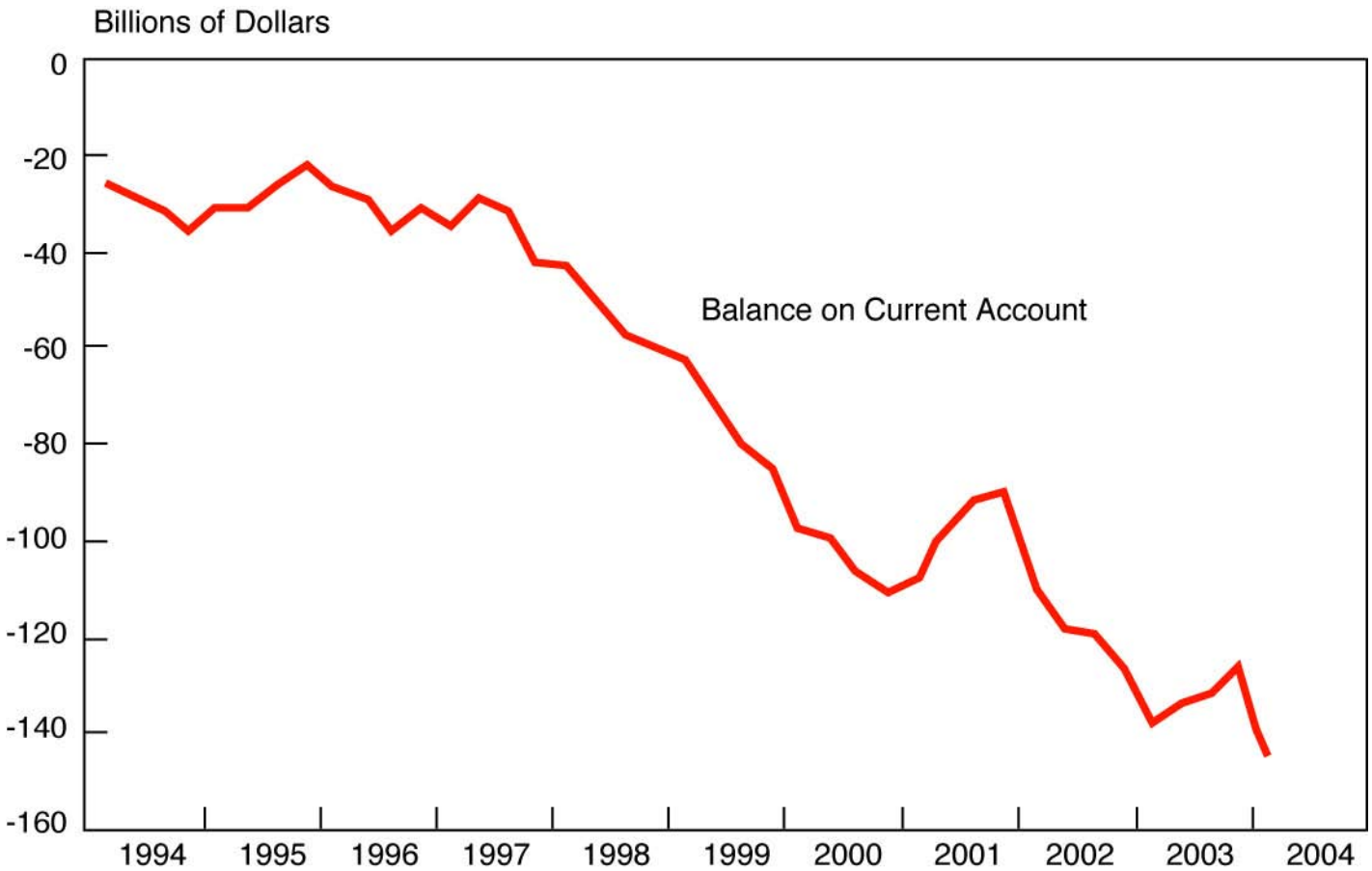
Foreigners are buying our debt and we buy their stuff



Source: Department of Commerce

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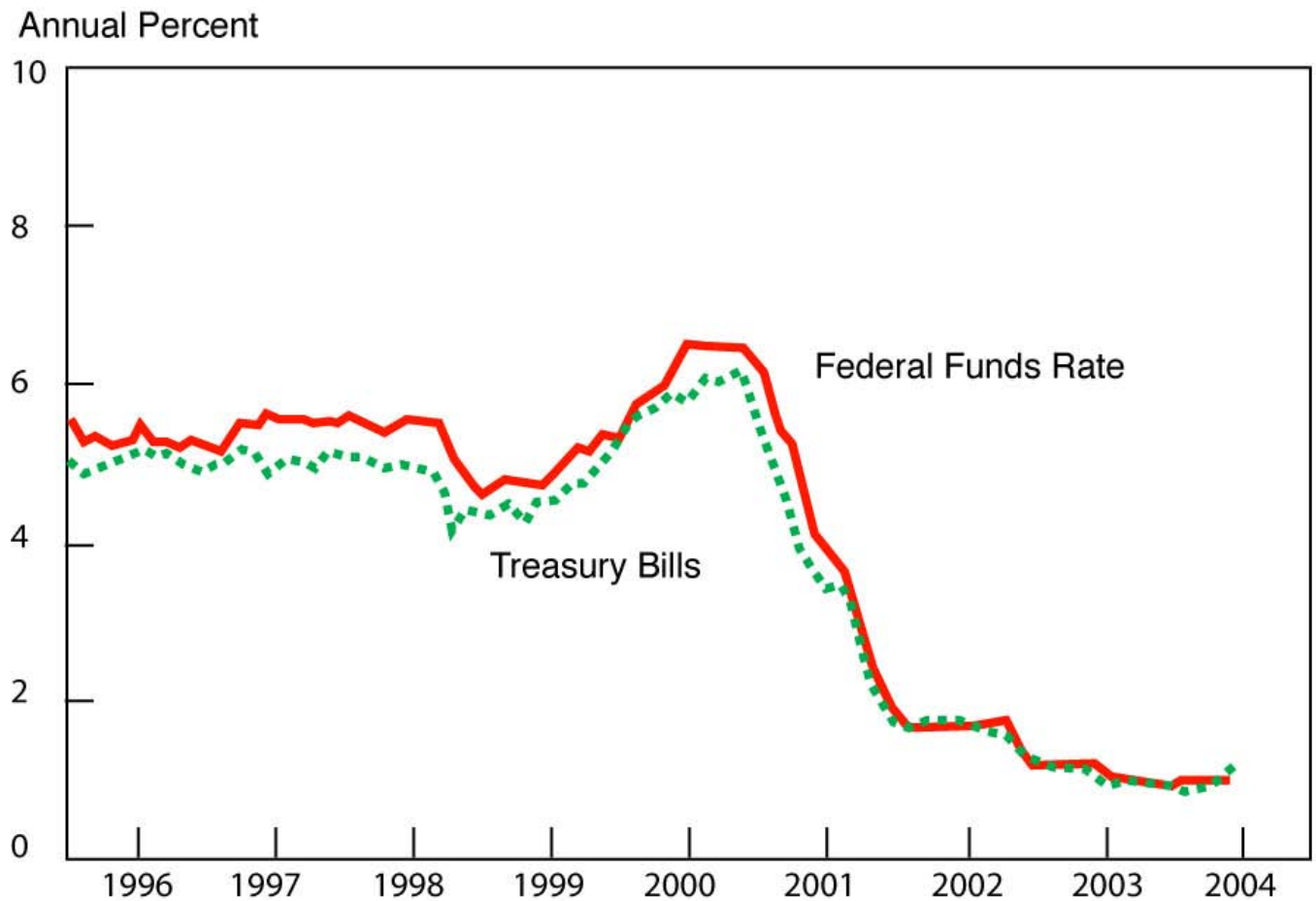
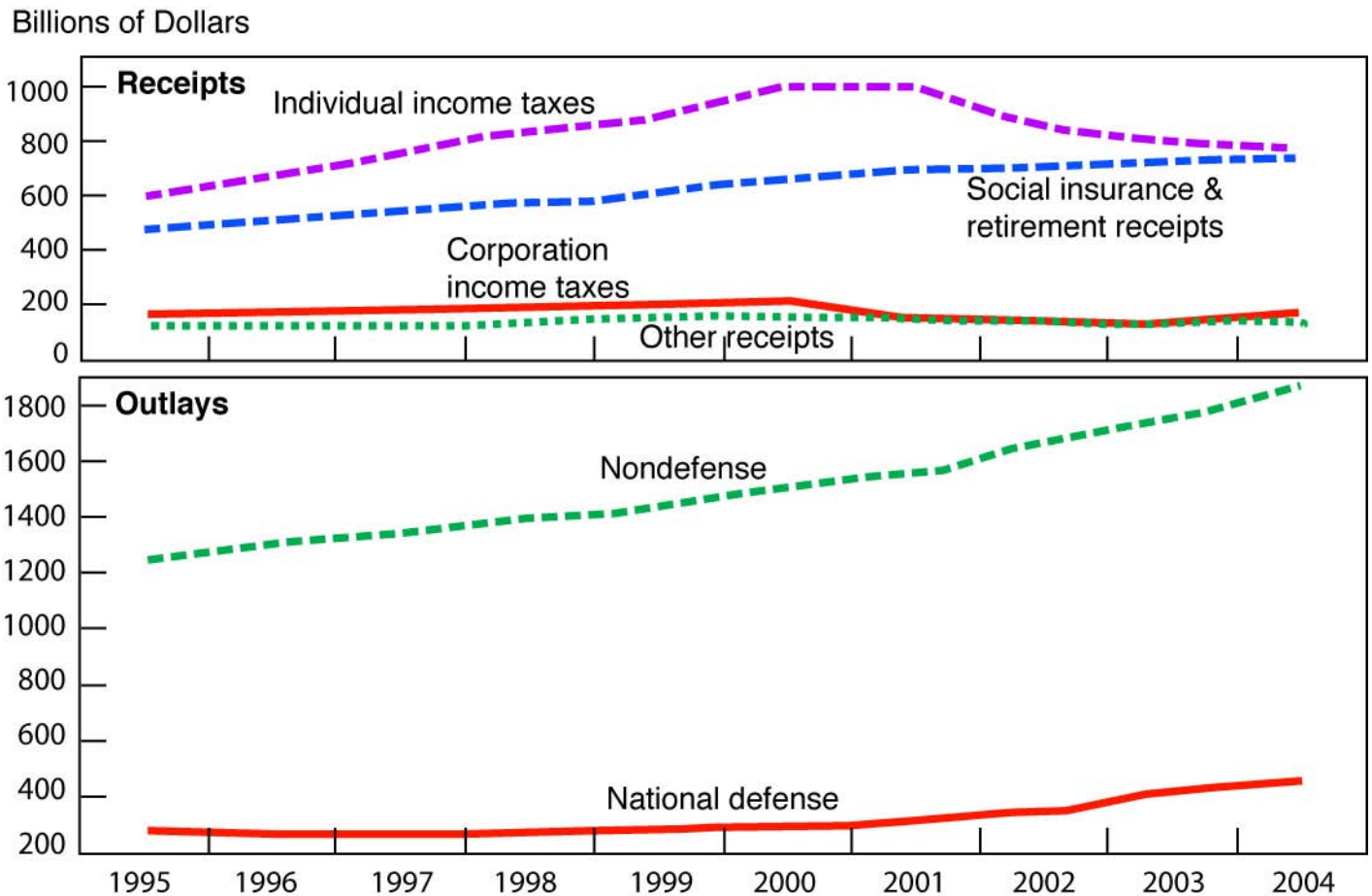
Interest rates are low and will increase



Source: Council of Economic Advisors

Non-defense* will grow



***(health, Medicaid, income security, social security, interest, other)**

Sources: Department of Treasury & OMB

Technologies from cold war S&T investment

(from OSD DT&E / 03)

Stealth
High performance fighter aircraft, jet engines
Spy satellites
Hypersonics
Terrain matching navigation
High precision navigation
High performance armor
High energy lasers
High power microwave weapons
Advanced signal processing (acoustic & radar)
Advanced simulators
Night vision devices
Synthetic Aperture & MTI Radar
High bandwidth communications
Unbreakable codes
High performance jammers

So what is the plan?

AF -- UAVs -- Robots
Army -- FCS -- Robots
Navy -- guided missiles from subs -- Robots
SOF -- sensor network assisted humans

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How will the nation spend its money on R&D?

- Energy → plentiful, clean, affordable
- Environment → clean, affordable
- Education → available, effective, affordable
- Transportation → clean, safe, affordable
- Manufacturing → flexible, clean, affordable
- Health Care → effective, affordable
- Security → effective, affordable, preserve civil liberties

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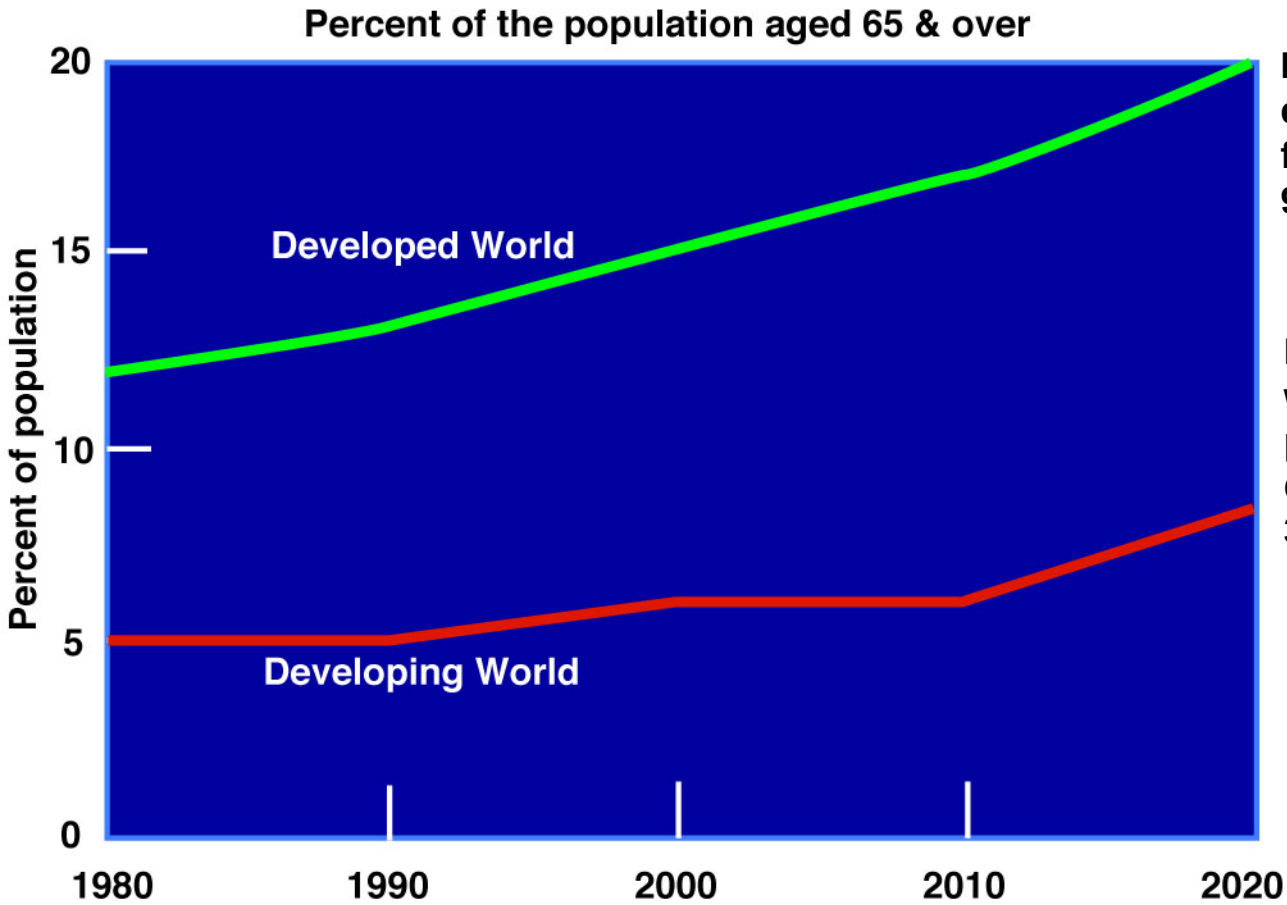
The barriers to affordable solutions are often technical

- Materials
- Computing
- Sensors
- Information technology
- Software
- Manufacturability
- Biotechnology

But, it is also the people, stupid!
or
Is it stupid people?

Demographics point to a major change



Source: UN (2001)

Max Life expectancy for females -- 90 years

Developed world population declining by 3 million/year

Max Life expectancy for females -- 80 years

Half of people over 85 have Alzheimer's

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Population growth & abrupt climate change could place heavy demands on water supplies

- Biological contaminants are increasing
- Chemicals in water system
- Heavy metals
- Ocean pollution
- Aquifer depletion (in Albuquerque, ~30 feet in 10 years)
- Abrupt climate change?

Water availability is likely to become one of the most pressing and contentious resource issues of this century

- By the year 2025, 48 countries containing 3 billion people will face fresh water shortages

Source: CIA / DoI / 2001

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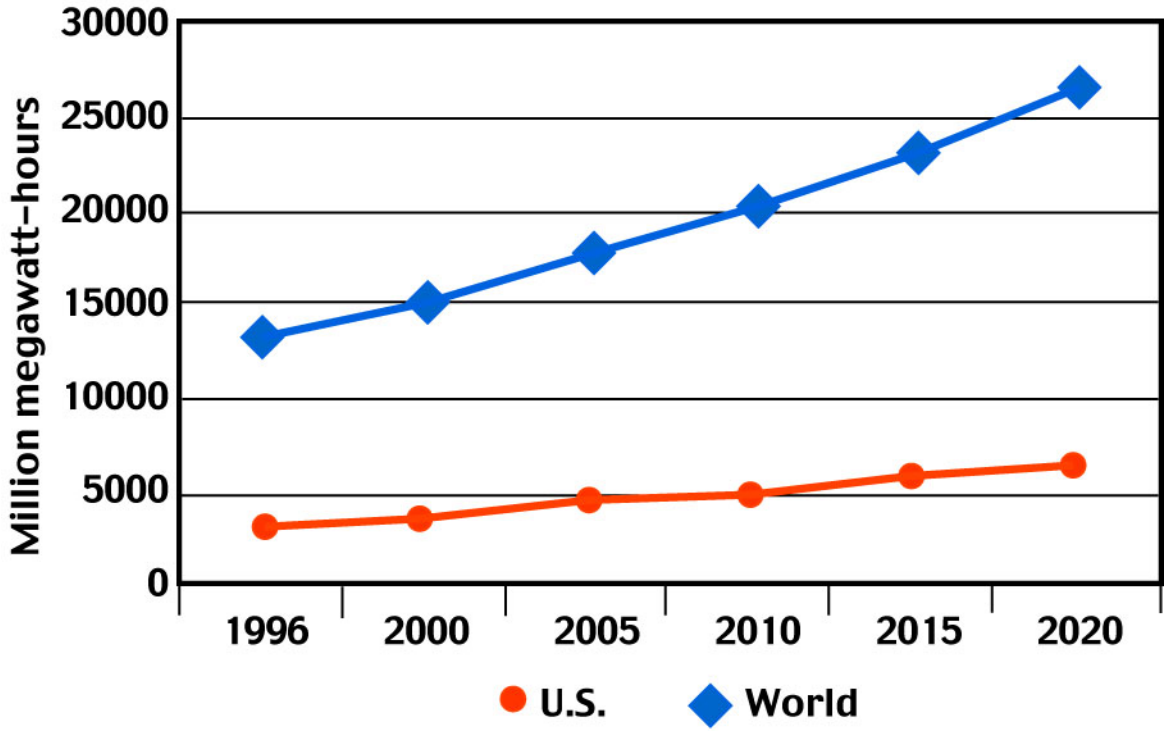
U.S. / world electricity demand



Source: World Energy Council and EIA projections

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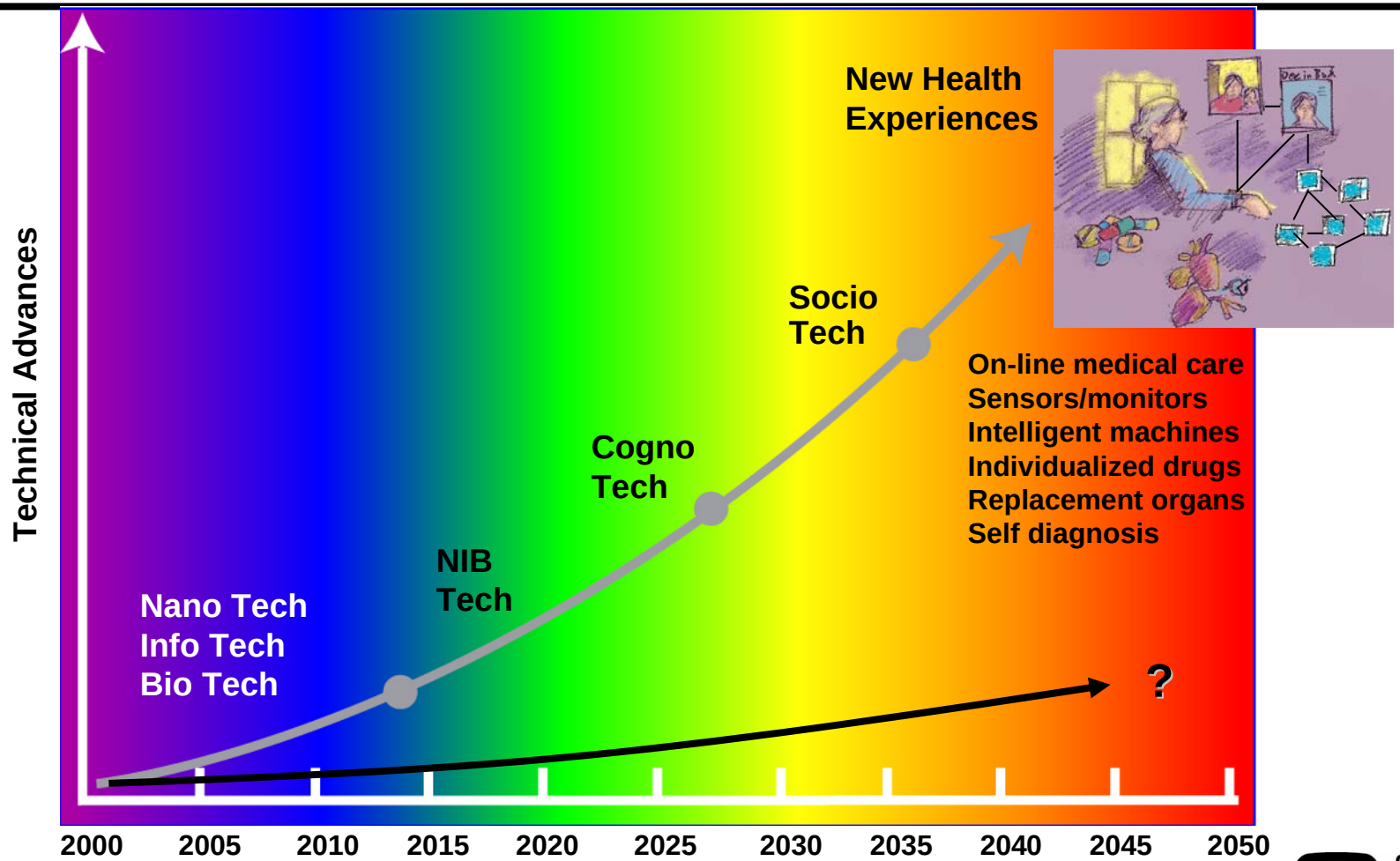
Tomorrow's health care needs will drive tech investments



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The vital issues

- Energy
- Environment (water)
- Education
- Economics
- Transportation
- Health Care

Security

- *Develop a strategic context*
- *Apply a system architecture*
- *Find and kill the terrorists*
- *Win the global war of ideas*

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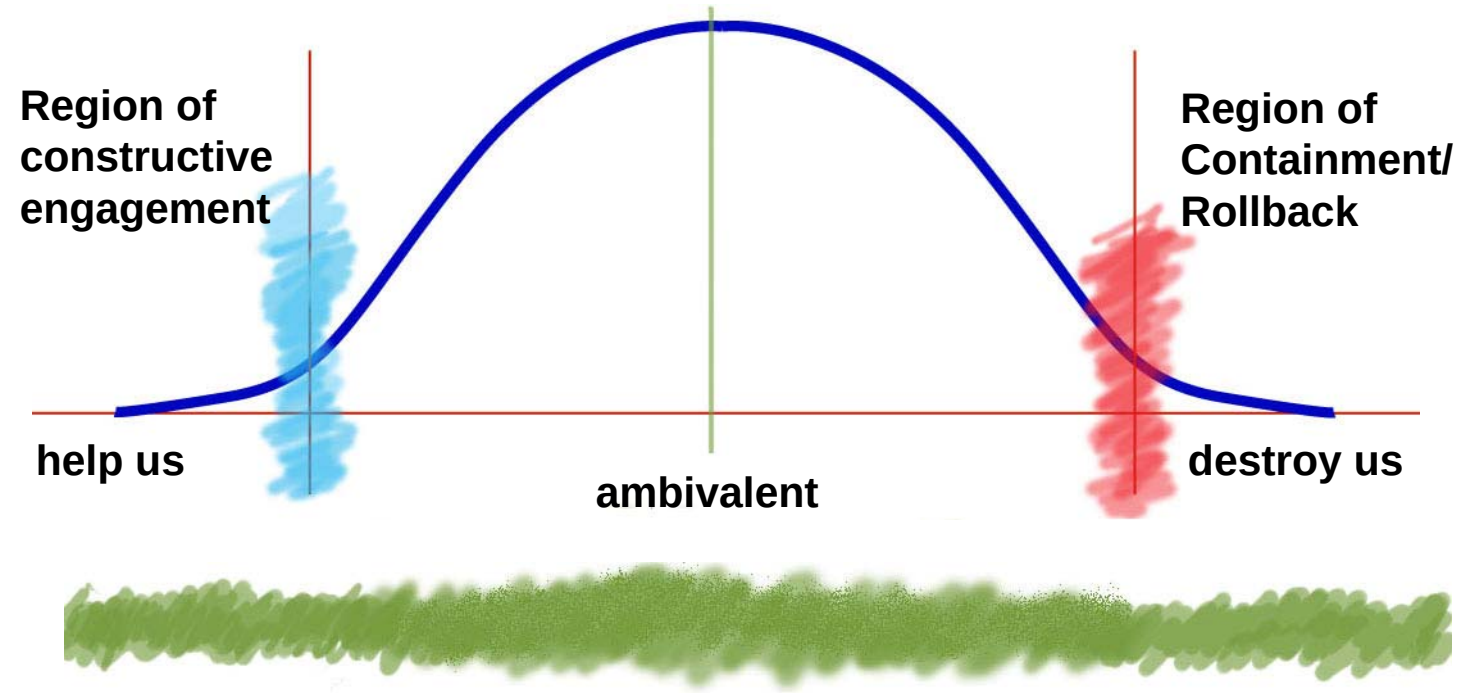
The Global War Of Ideas (GWOI)

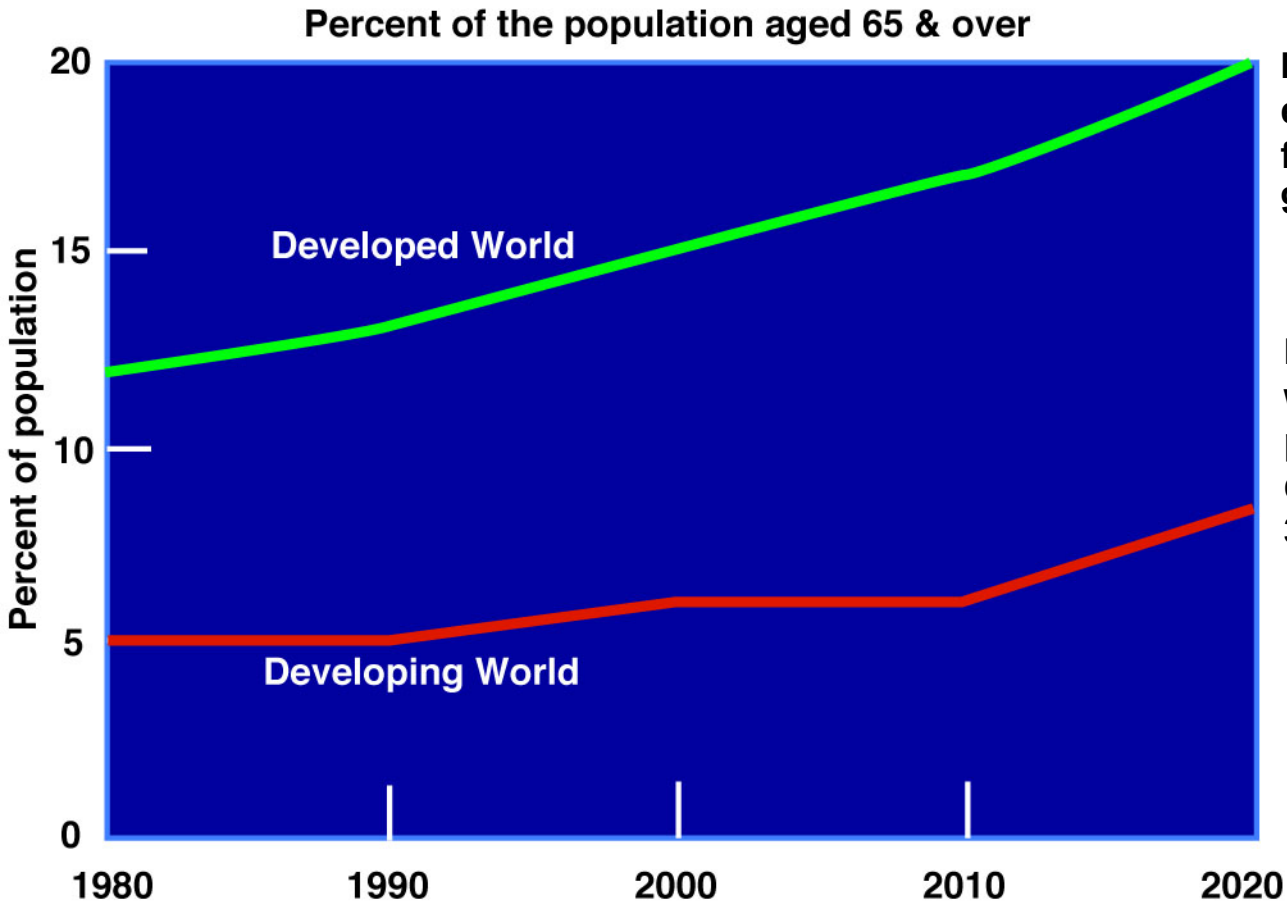


The global war within Islam will be fought on three battlegrounds: Engagement, Containment/Rollback, Global Opinion

Concepts for GWOI

- Quantify the distribution: help us -- ambivalent -- destroy us
- Targeted strategy
- Disrupt mobilization process
- Work through third party moderates
- Infiltrate the cellular network structure

Demographics point to a major change



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- Biotechnology

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Kinetic weapon needs against hard targets

- Physical destruction of HDBT with penetrating weapons
  - RNEP
  - Multiple, large conventional bombs.
  - Large Kinetic Energy impactors/rods/jets
- Reliable smart fuses for fast pentrators
- Functional defeat with exquisite intelligence (persistent, ubiquitous, all weather ISR) for location, characterization, and BDA.
- Chem and bio weapons defeat with radiation and long duration high temp

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Kinetic weapons against soft fixed & relocatable targets needs

- **Smarter weapons that understand location, status, effects, and communicate for real time connectivity and BDA could be developed**

- **Precision delivered hypersonic masses, rods, and flechetts offer the potential for high lethality and low colateral damage**

- **Sensor controlled and multimode munitions**

- **Pre-deployed on-site sensors or short range weapons for precision strike and rapid response eg: UGS, NETFIRE, SOF**

- **Perch, search, lurch**

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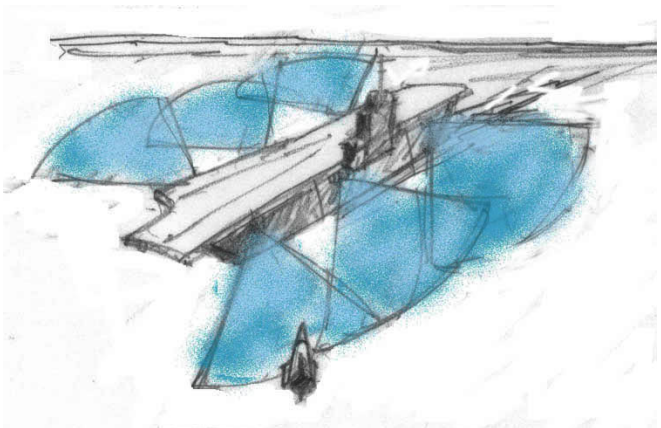
Will military application of beams ever be real?

- Speed of light weapons including lasers, HPM, & particle beams, non-lethal weapons

HPM



Proton Shield

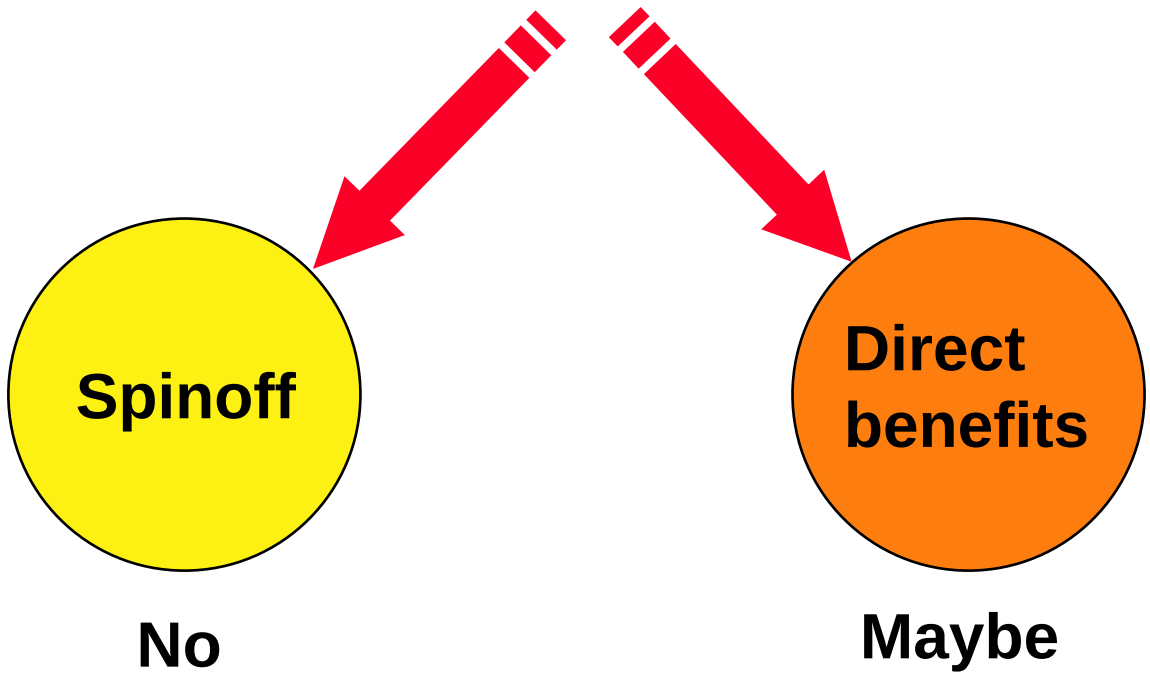
Sensory overload from combined effects

Summary of needs

- Nuclear and non-nuclear penetrators
- Diggers/sensors for underground warfare
- Brilliant weapons/location, status, effects, comm, BDA
- Agent defeat weapons
- Info ops/functional kill/asymmetric war
- Non lethal weapons

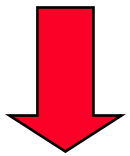
Role of National Labs?

- Affordable benefits?
- Relevance, timely, cost effective?



More C^3 needed for relevance

- Consolidate to sustain and enhance competencies
- Cooperate on shared problems
- Compete for applications



- The key to relevance is rapid application of the right tech

Research → Development → Application

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The right tech

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Role of National Labs

- Accelerate solution realization
- Share cost and risk
- Enhance critical capabilities
- Provide focus
- Integrate biological,social, and physical sciences in system solutions

Catalyze interdisciplinary teams for system solutions

Government - Universities - Industry - Lab - Teams

GUILT

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Conclusion

- The rate of political, economic, social, tech change is increasing
- The driving forces for solutions are inescapable
- Advances in technology can be part of the solution
- Rapid/agile/relevant deployment of solutions is essential
- GUILT offer a way to speed and affordability

Prepare for inevitable surprises

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