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Economic Security: Neglected Dimension of National Security?

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By
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Perspectives on Techno-Industrial Policy for the US Biotechnology Sector

NDU PANEL DISCUSSION – THE ECONOMIC ELEMENT OF NATIONAL SECURITY

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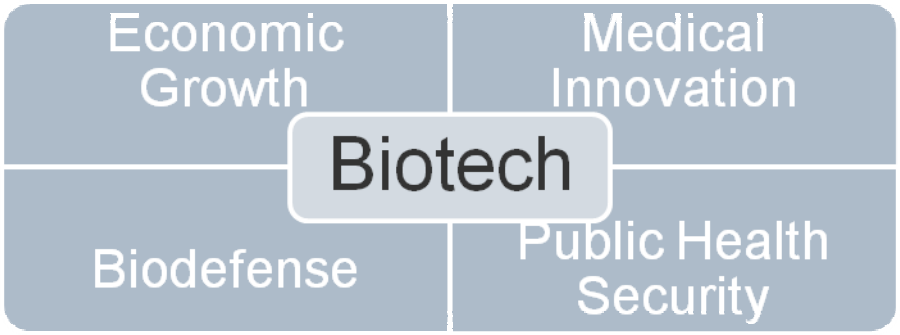
PRTM *Management Consultants*

Where Innovation Operates

This is the *"Century of Biotechnology"*

Yet, US is losing ground in high-tech competitiveness

- "Sophisticated engineering and manufacturing capabilities that underpin innovation …have been rapidly leaving… the U.S. has lost or is in the process of losing the knowledge, skilled people, and supplier infrastructure needed to manufacture many of the cutting edge products it invented."[1]



Robust techno-industrial policy for biotechnology is an economic security imperative for the US

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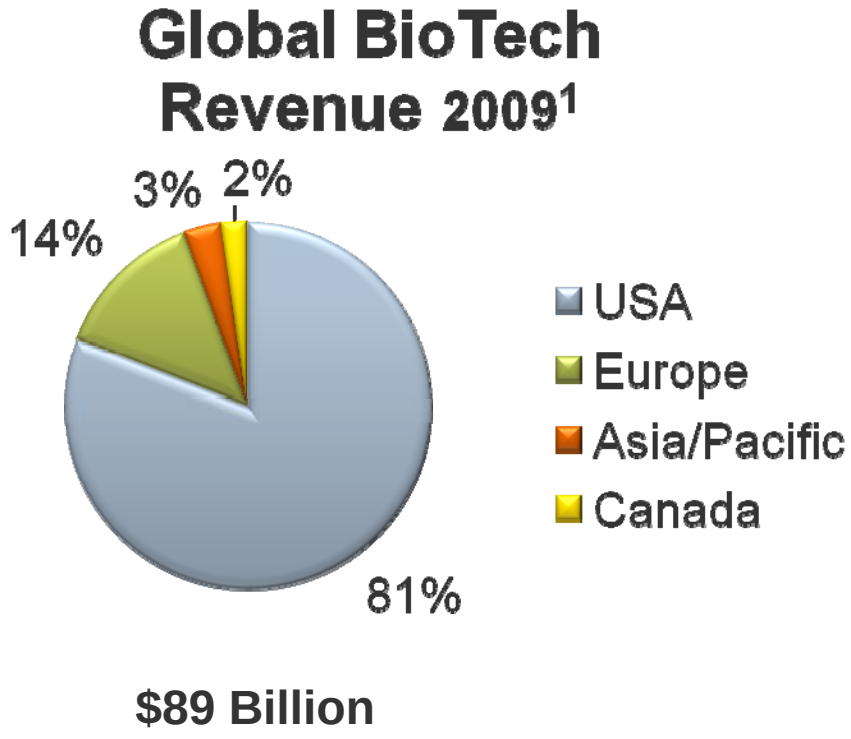
[1] Pisano, Gary P., and Willy C. Shih. "Restoring American Competitiveness." *Harvard Business Review* July-August (2009): 114-25.

Economic Value of the Biotechnology Sector

US Economy

- **Growth** – $8 B (1992) to $72 B (2009) (CAGR 15.31%)
- **Employment** –146,000 (2009)
- **R&D** - 76% of worldwide R&D; $19 B (2009)



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[1] "Industry Overview." The Medica, July 2009
2 Aug. 2010, http://www.themedica.com/industry-overview.html

Societal Value of the Biotechnology Sector

National Health Security

- Biodefense innovations will enable next generation medical countermeasures (e.g. - broad-spectrum), diagnostics, and more

In July 2010 HHS awarded four R&D contracts for innovative platform technologies

"These innovative technologies have demonstrated success in late stage clinical development to other commercial products and are being applied to pandemic influenza and anthrax." [1]

International Public Health

- Biotechnology advances for pandemic influenza, emerging infectious diseases, and "new tech for old threats"

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[1] "BARDA Awards Four Contracts for Innovative Platform Technologies Applied to Medical Countermeasure Development." *MedicalCounterMeasures.gov*. BARDA, 30 July 2010. Web. <https://www.medicalcountermeasures.gov/InnovationsBAA.aspx>.

Domestic Techno-Industrial Policy Examples

Sematech (1987)

- 14 U.S. semiconductor companies formed R&D consortium received
- $100 million annual USG subsidy for 10 years[1]
- Members offset R&D spending by $300 million/yr [2]
- "Sematech demonstrated that government-industry R&D consortium…can help improve a U.S. industry's technological position while protecting the government's interest." [1]

BioShield and PAHPA (2003, 2006)

- BioShield Special Reserve Fund $5.6 B
- Pandemic influenza public-private partnerships $7.1 B
- Therapeutic discovery project credit (BIO and PhRMA)

[1] U.S. General Accounting Office. *Federal Research - Lessons Learned from SEMATECH*. Washington, DC: GAO, 1992.

[2] U.S. National Bureau of Economic Research. *High Tech R&D Subsidies: Estimating the Effect*. By Douglas A. Irwin and Peter J. Klenow. Cambridge: National Bureau of Economic Research, 1994. NBER Working Paper Series #4974.

International Techno-Industrial Policy Examples

China

- Plan for 7 strategic industries, including biotechnology (Sept 2010) [1]
- Invest $1.5 billion in new drugs (2011 - 2016)
  - 20 venture funds ($100Ms) for drug and energy companies

"Patient" economic development initiatives seen in:

- Korea – Computer memory, Flat panel TVs
- Japan – Automotive industry
- Singapore, Ireland, UAE – Biotechnology, Biopolis, Healthcare

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1 "China to Finish Draft Plans for Strategic Emerging Industries by End-Sept." *Business China | Finance, Economics, Business and Industry News from China*. Web. 6 Aug. 2010. <http://en.21cbh.com/HTML/2010-8-6/emerging-industries.html>.

Challenges in Biotechnology Industrial Policy

General Challenges…

- **"Patient money:"** Sustain credible resource commitment over decade(s), across successive U.S. administrations

For Biotechnology…

- Big Pharma's pipeline innovation crisis (1998 – 2003)[1]
  - Success rates - 14% ↓ 8%
  - R&D and launch costs - ↑ 50%
- Economic crisis has squelched VC investment
- USG and the Gates Foundation emerged as major funders for R&D
  - Public-Private partnerships: tipping point?
- Insufficient market pull for Biodefense and Public Health products
  - Market Assurance

MNCs: National versus Global interests?

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1 Gilbert, Jim, Preston Henske, and Ashish Singh. "Rebuilding Big Pharma's Business Model." *The Business and Medicine Report* 21.10 (2003). Web. 18 Aug. 2010. <http://www.bain.com/bainweb/PDFs/cms/.../rebuilding_big_pharma.pdf>.

Crafting Effective Biotechnology Policy

Build on Momentum in HHS and DoD

- BioShield not yet a coherent policy for biotech competitiveness

Consider Institutional Mechanisms

- Cabinet-level innovation czar?
- USG Roadmap for long term policy vision?
- Engage industry (PPPs?)

Build robust policy (short- and medium-term)

- R&D public-private USG consortia?
- Tax incentives?
- Education and science/technology workforce policy?
- Market Assurance: USG as reliable customer for biotech?
- Vaccination PH (and Pricing) policy?

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Appendix

PRTM Works to Address Domestic and International Health Initiatives

PRTM is primarily a business and operations management firm, with a deep understanding of life sciences technology market requirements

- Our collaborative work style brings the flexibility to work side-by-side with all types of experts, including medical and in-country niche capabilities
- We also have a core of consultants with deep capabilities in product innovation, global supply chain design, public and government health issues, and market assessment

PRTM is proud to have collaborated with many entities in advocating global life sciences initiatives, including:

- Life sciences technology (biopharmaceutical, diagnostic, and device) companies
- Public health organizations focused on epidemic preparedness and countermeasures
- Medical and health system economics and research organizations
- Government entities focused on “mission assurance” in remote and hazardous areas

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PRTM's Global Life Sciences Work Is a Core Practice Area, Leveraging Our Technology and Process Focus

30+ years of operational strategy and business/organizational innovation

- ~35% of business in life sciences; 40% in high-tech/electronics/aerospace
- Dedicated practice in government and public health—focused growth area
- Major work in Biodefense, pandemic preparedness, and supply chain management
- Successful international experience with public health grantees

19 offices worldwide; > 600 consultants
Over 1,200 clients and 6,000 projects
90% level of repeat business

Bangalore Boston Chicago Dallas Detroit Frankfurt Glasgow London Lima Munich New York Orange County Paris Shanghai Silicon Valley Tokyo Washington, D.C.

PRTM consultants are highly qualified academically and professionally

- Large proportion with engineering or technical degrees, combined with an MBA and/or MPH
- Extensive operating experience in large companies, startups, and public sector organizations
- Significant number of consultants with advanced scientific degrees
- Typically, a high involvement of partners and principals in all engagements

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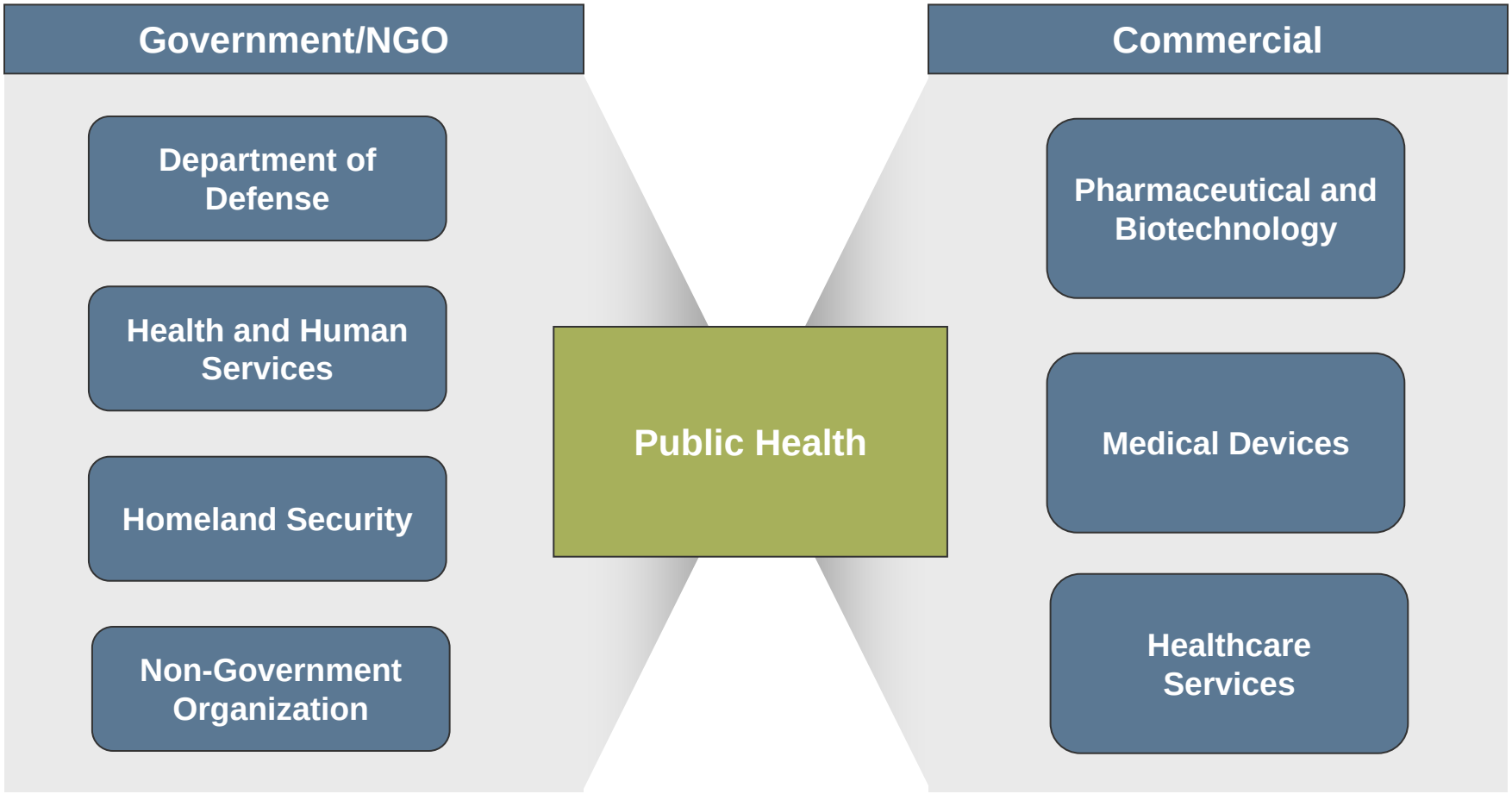
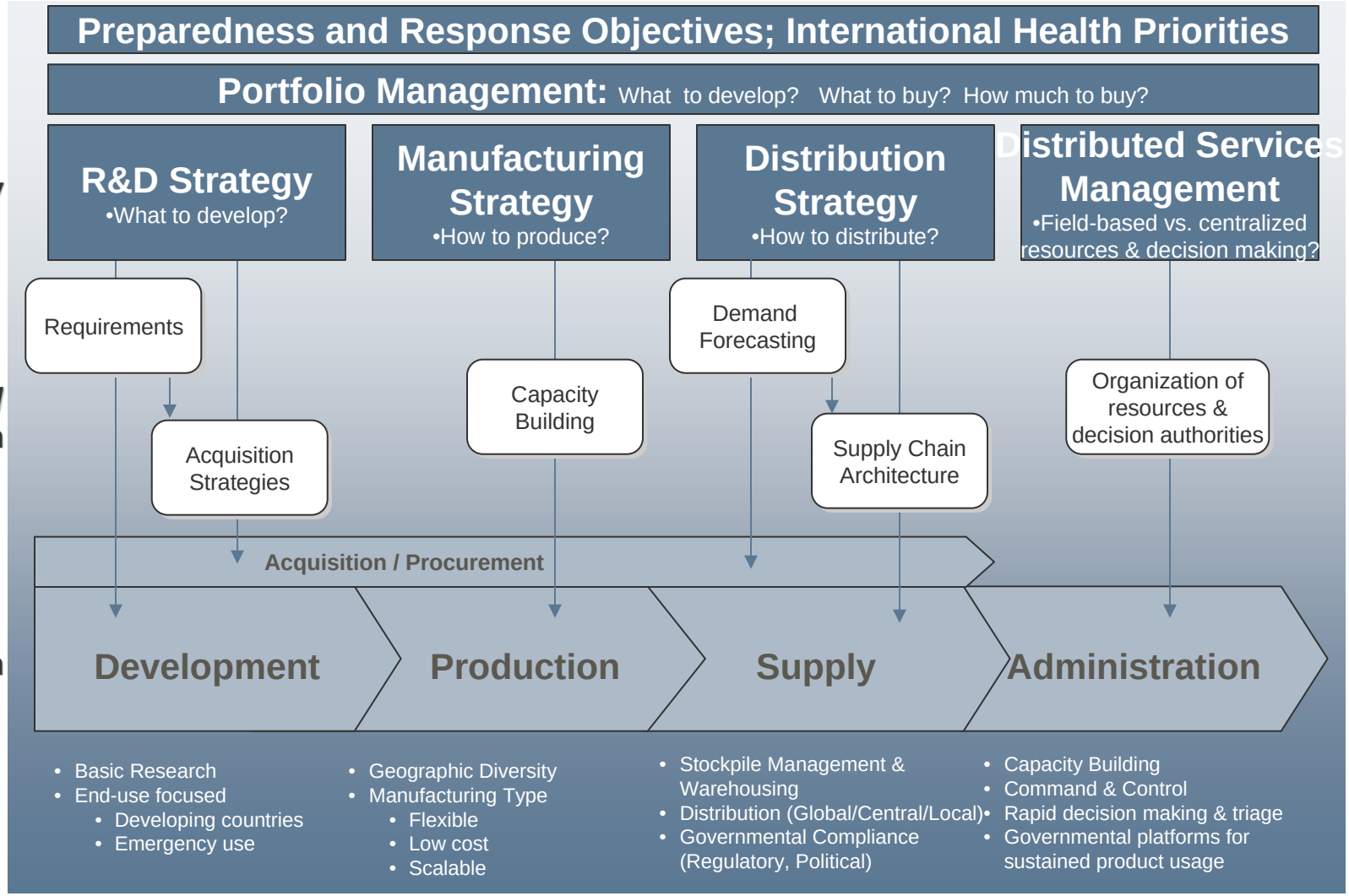
Our Work in Public Health Combines Our Roots in Government and Commercial Healthcare



PRTM's Tools and Techniques Apply to Every Step in the Health Sector Value Chain



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