

The National Research Council Assessment of
The Small Business Innovation Research Program



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Presentation Topics

- The SBIR Program
- Advantages of the Program Concept
- Program Dimensions
- NRC Evaluation of SBIR



The Small Business Innovation Research (SBIR) Program

- Created in 1982, Renewed in 1992 & 2001
- Participation by all federal agencies with an annual extramural R&D budget of greater than \$100 million is mandatory
 - Agencies must set aside 2.5% of their R&D budgets for small business awards
- To be a \$2 billion per year program in 2004
 - Largest U.S. Partnership Program



Why is SBIR Important?

- Innovation is Key to Economic Growth, New Products, and New Jobs
 - The world looks to the U.S. economy as a model of productivity, growth, and innovation
- Innovation (i.e., Doing Things Faster, Better, and Cheaper) is also Essential to the U.S. Defense & Strategy
- SBIR Contributes Directly to Innovation across the Government and the Economy by Helping Companies Innovate

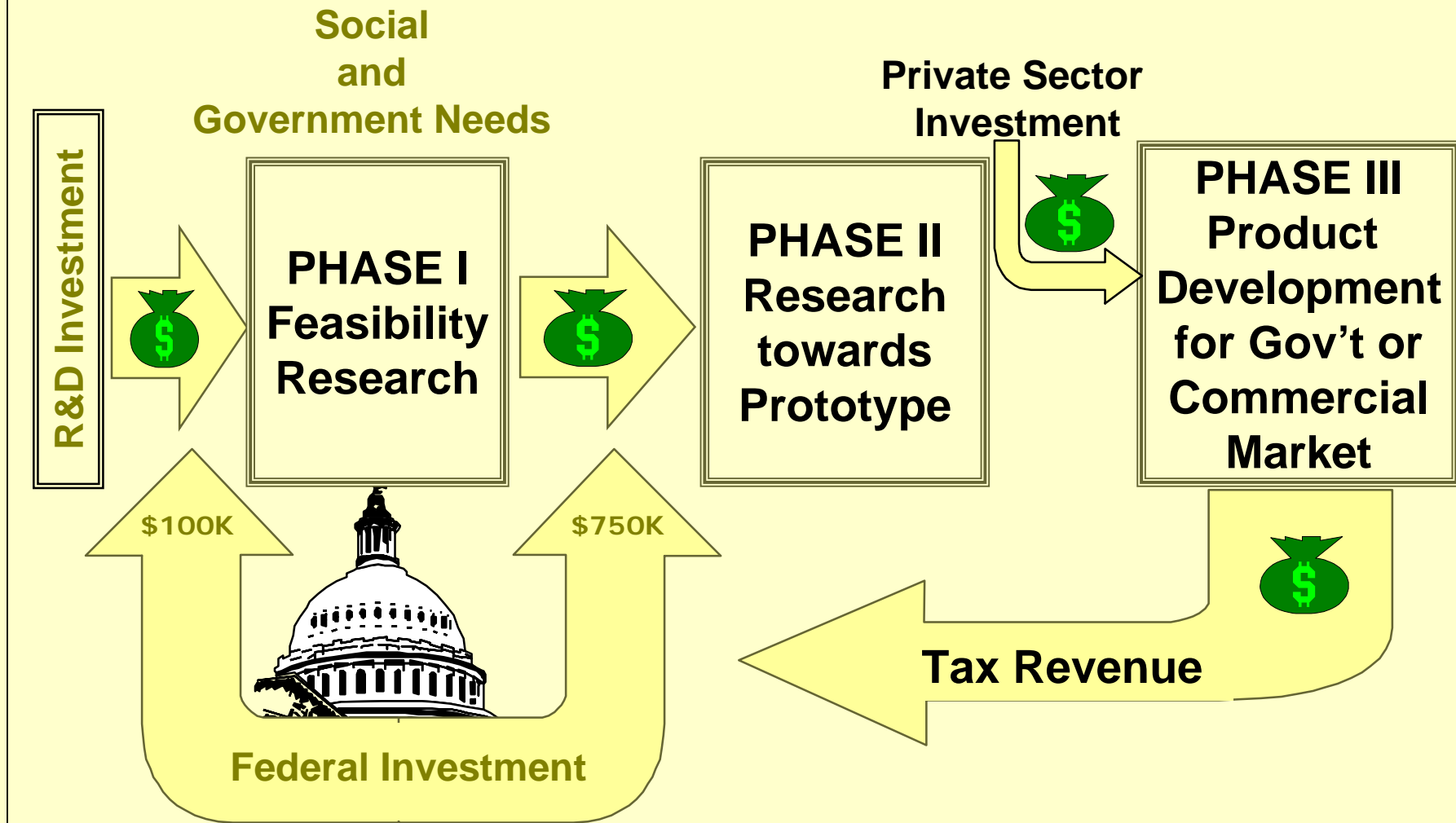


How Does SBIR Work?

- It Provides Early Encouragement to Innovators
 - The “first money is always the hardest money” to obtain
 - It provides new information to markets—a positive signal of quality and potential to investors
- It Capitalizes on Existing Federal Investments in Science & Technology



SBIR Model



Advantages of the Program Concept

Entrepreneur Friendly
Helps Address Agency Missions
Benefits to Society



SBIR's Attraction to New Entrepreneurs

- Having a company not required to apply for a grant
- Companies and Researchers can apply to different agencies at the same time
- Agency outreach programs provide guidance and encouragement
- Entrepreneur can explore technical and commercial feasibility under Phase I before taking the full plunge



SBIR is Entrepreneur Friendly

- Why do Entrepreneurs like it?
 - No dilution of ownership
 - No repayment required
 - Grant recipients retain rights to IP developed using SBIR funds
 - No royalties owed to government
 - Awards attract private capital
 - A Certification Effect of Technical Feasibility and Commercial Potential



SBIR's Attraction to Policymakers

- Catalyzes the Development of New Ideas and New Technologies
 - Over time this transforms the economy with new products and new industries.
- No Budget Line—a Stable Program that has Grown Over Time and Allowed Learning to take Place
- Addresses Gaps in Early-Stage Funding for Promising Technologies
 - Attractive to Small Firms—political support
- Helps Small and Large Companies with Innovative Products for Export



SBIR Contributes to Government Missions

- Provides a Bridge between Small Companies and the Agencies for Procurement and Research
- Contributes New Methods and New Technologies to Government Missions
 - Cheaper, more effective defense solutions
 - Better, more cost effective health care
 - Environmental friendly technologies and transport
- Helps Bring New Suppliers to Meet Agency Needs



Program Dimensions

Program Growth & Agency Participation



SBIR: Congress Designated 4 Major Goals

- Increase Private-Sector Commercialization of Innovations Derived from Federal R&D
 - Raised to 1st priority in 1992
- Stimulate Technological Innovation
- Use Small Business to Meet Federal R&D Needs
- Foster & Encourage Participation by Minorities & Disadvantaged Persons in Technological Innovation



Steady Program Growth

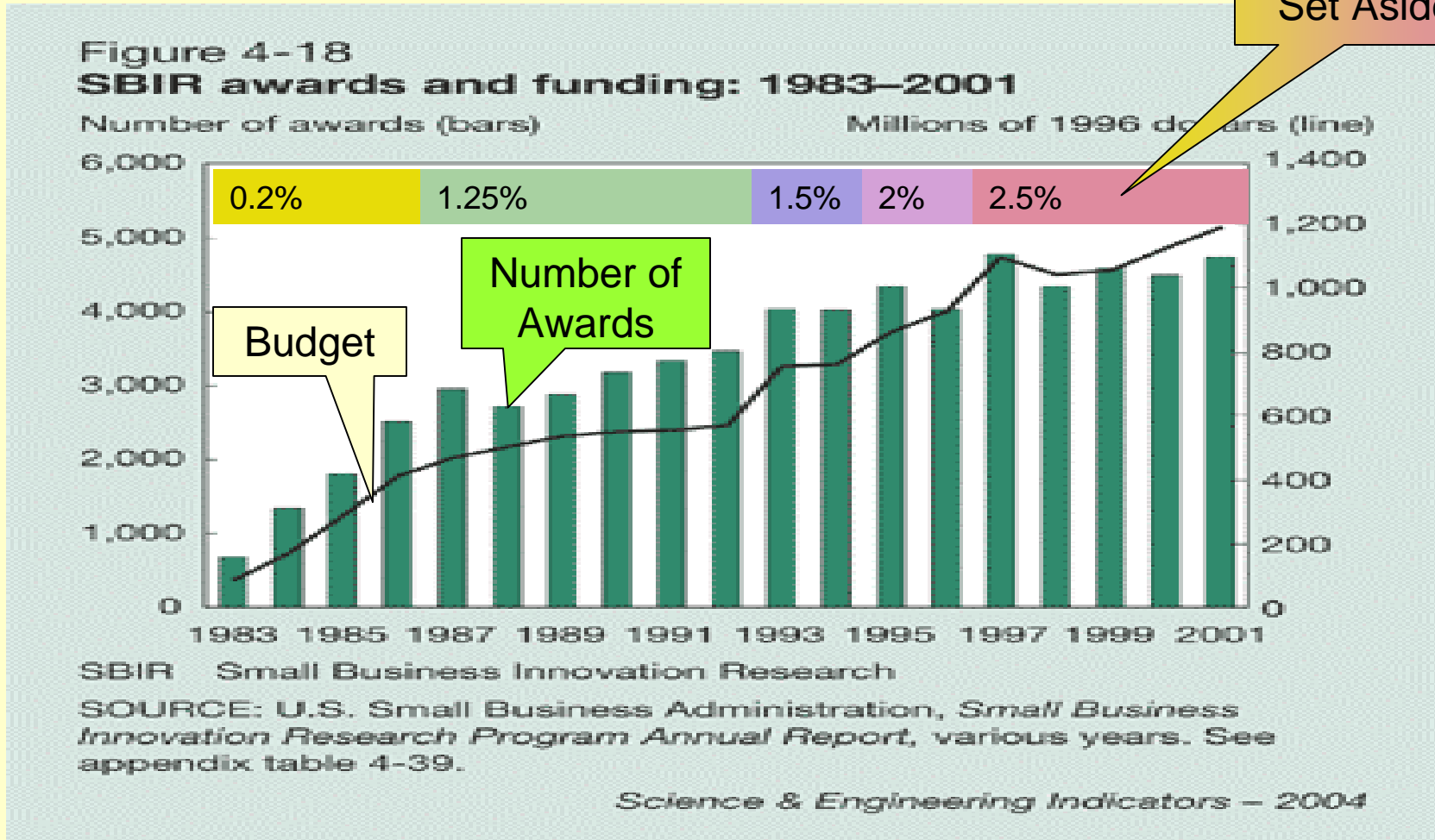
- Growth in Amount of R&D budget to be set-aside for SBIR

1982-86	1987-92	1993-94	1995-96	1997-present
0.2+%	1.25%	1.5%	2.0%	2.5%

In 2004 ~\$2 Billion Program



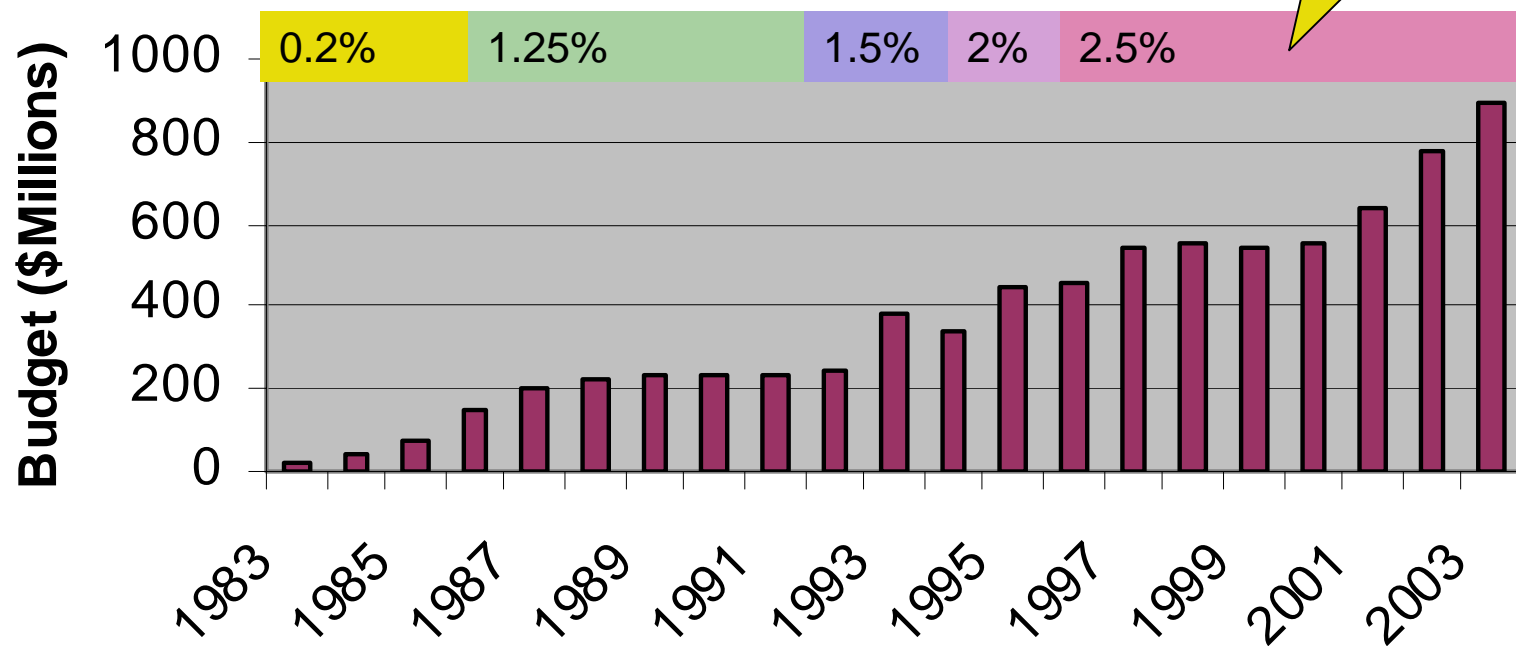
SBIR: Program Growth



SBIR Program Growth at DOD

FY2003 DOD SBIR Budget = \$894,949,718

Phase I Awards=2113, Phase II Awards=1080



Source: DOD SBIR Annual Report Summary



SBIR Budget at Participating Agencies

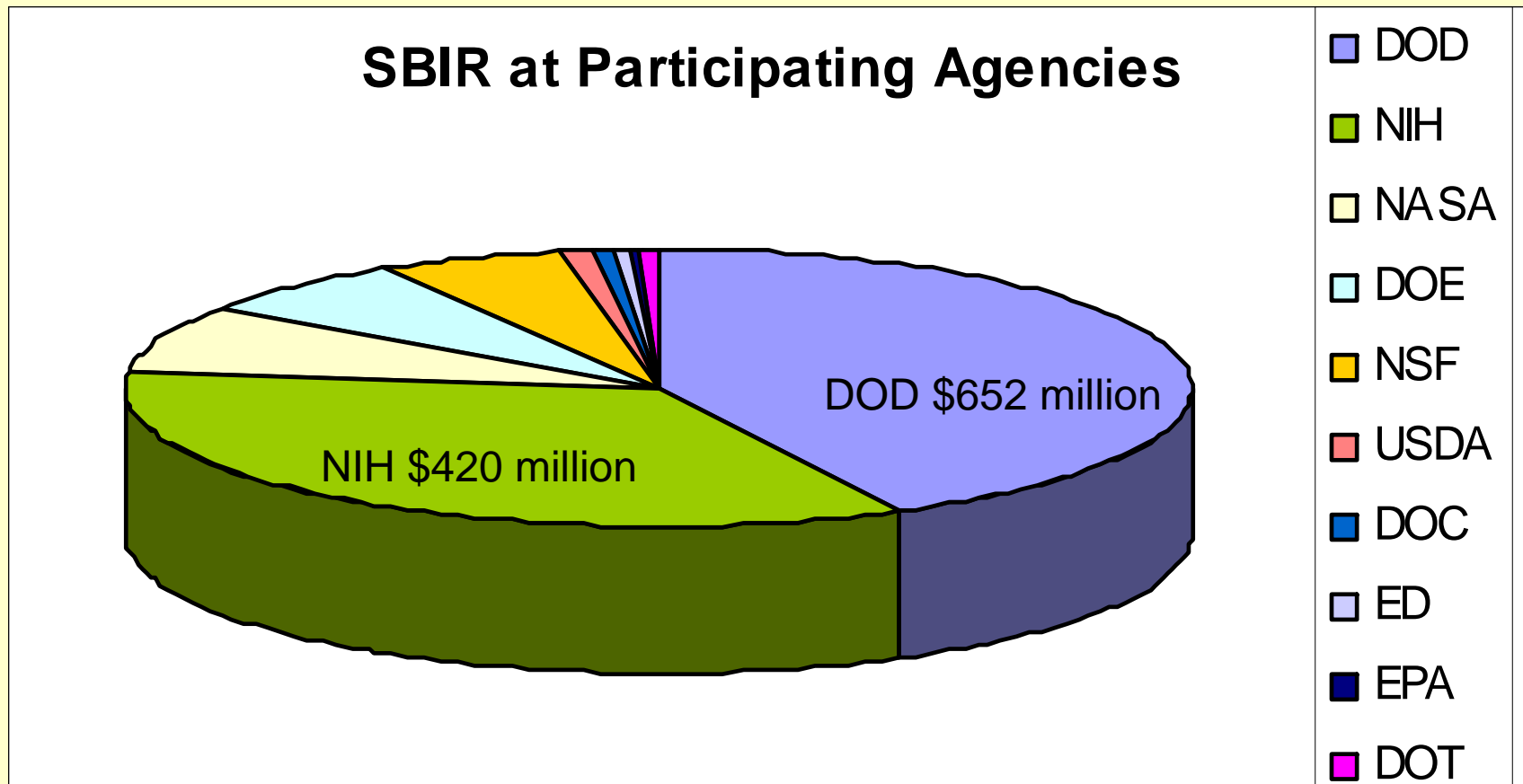
Total ~\$1.4 million in FY 2002

Major SBIR Agencies	
Defense DOD	\$652 million
Health HHS	\$420 million
Space NASA	\$106 million
Energy DOE	\$87 million
Science NSF	\$72 million

Minor SBIR Agencies	
Agriculture USDA	\$16 million
Commerce DOC	\$7 million
Education ED	\$7 million
Environment EPA	\$6 million
Transportation DOT	\$6 million



DOD and NIH are Largest Participants



TOTAL ~ \$1.4 Billion FY 2002



Program Evaluation

The Challenge of Assessing SBIR



Past SBIR Assessments

- Despite its size and 20 year history, there is little prior assessment of SBIR
 - Academic Analysis is Limited as is Government Analysis
 - Existing reviews are anecdotal, or do not factor the many complex facets of the program
 - Most Agencies have Limited or no External Assessment, and
 - Most internal reviews are never released
- DOD was the first to conduct a rigorous assessment of its SBIR Fast Track Program, undertaken by the National Research Council



Assessment of DOD Fast Track

- The National Academies Study* found:
 - SBIR was contributing to the achievement of DOD mission goals
 - Valuable innovation projects were being funded
 - a significant portion of DOD's projects would not have been undertaken in the absence of SBIR
 - The Fast Track program increased the effectiveness of SBIR at DOD
 - encouraged the commercialization of new technologies
 - Encouraged the participation of companies new to the program

National Research Council. 2000. *SBIR: An Assessment of the Department of Defense Fast Track Initiative*, Charles W. Wessner, ed., Washington, D.C.: National Academy Press.



NRC Findings and Recommendations

- Properly Managed SBIR Grants to Small Business are Effective
- Program could be improved through Regular Evaluation
 - Internal review
 - External assessment
- The National Academies called for More, & More Systematic, Evaluation of SBIR



New Multi-Year, Multi-Agency NRC Study of SBIR

Congress Agreed and requested the NRC review the 5 largest agencies that account for 97% of the program's funding in 2003

- Department of Defense
 - National Institutes of Health
 - Department of Energy
 - National Aeronautics and Space Administration
 - National Science Foundation
- **A \$5 million, 3-year study**



The NRC's SBIR Committee

- Chair: Jacques Gansler, University of Maryland*
- Tyrone Taylor, Capitol Advisors on Technology
- David Audretsch, Indiana University
- Gene Banucci, Advanced Technology Materials, Inc.*
- Jon Baron, Coalition for Evidence-Based Policy*
- Michael Borrus, The Petkevich Group, LLC
- Gail Cassell, Eli Lilly and Company
- Elizabeth Downing, 3D Technology Laboratories*
- Kenneth Flamm, University of Texas at Austin*

*Direct Experience in Management or Receipt of SBIR Awards.



The NRC's SBIR Committee, Cont...

- Christina Gabriel, Carnegie Mellon University*
- Trevor Jones, BIOMECH Inc*
- Charles Kolb, Aerodyne Inc*
- Henry Linsert, Martek*
- Clark McFadden, Dewey Ballantine
- Duncan Moore, University of Rochester*
- Kent Murphy, Luna Innovations
- Linda Powers, Toucan Capital
- Charles Trimble, Trimble Navigation*
- Patrick Windham, Windham Consulting

*Direct Experience in Management or Receipt of SBIR Awards.



Current Status of NRC Study of SBIR

- **Phase I** has been completed,
 - Gathered initial information about agency operations of the SBIR program
 - Developed a methodological approach to evaluation, and
 - Developed surveys, case study templates, and other research tools needed to carry out the evaluation.
- **Phase II** is underway
 - NRC's researchers are sending out surveys, finalizing others, and beginning case studies
- **Phase III** is coming up
 - The NRC's SBIR Steering Committee will assess the results and publish its **findings and recommendations** to improve the program



Issues for the NRC Committee

- **Modify Program Structure?**
 - Should Phase I be larger?
 - Should Phase II be larger?
 - Should there be a Phase III Award?
 - like NSF's Phase II-B
- **Should VC Backed firms be Participants?**
 - ...as they have previously been
- **Possible Administrative Improvements**
 - How to better align Program Cycles to Research Cycles?
 - How to reduce Paperwork Burdens without losing Quality that comes from careful Oversight
 - Do Firms need Support in the Application Process? Do State Programs Help?



Flexibility & Diversity Across Agencies

- The NRC Committee's First Report Identifies Multiple Administrative Systems
 - Each agency typically has its own manner of choosing awardees and screening applications
 - Different metrics reflecting unique agency missions and needs
 - Different Metrics by industrial sector, e.g., software vs. drug development vs. weapon components
- This Flexibility & Diversity appears to make program better adapted to Agency Missions and to Entrepreneurs' Goals



We Need your Help in Evaluating SBIR

- Understanding SBIR is Complicated
- Need to Better Understand its Role in Early-stage Finance
- What Works Well and What Could be Improved?
- We seek your input
 - We look forward to hearing from you



THANK YOU



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