Crossing the Valley of Death

The Role of the SBIR Program

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The Good News and the Bad News

New, Substantial Commitments for Technology Innovation, but Myths about the Innovation Process Remain

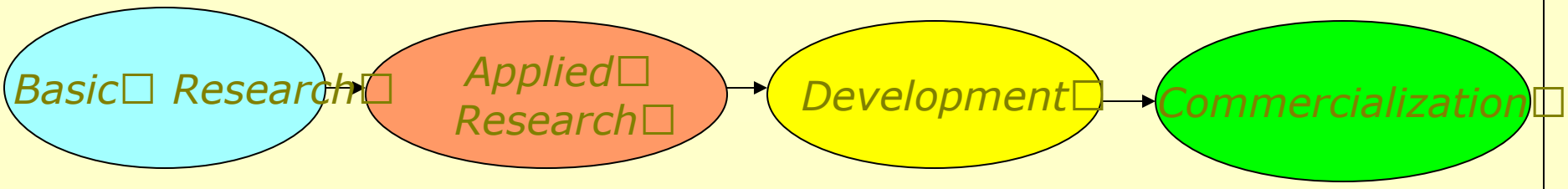
2009 Stimulus Bill Provides $21.5 Billion: A Short Term Boost for Federal R&D

- Basic competitiveness-related research, biomedical research, energy R&D, and climate change programs are high priorities
  - National Science Foundation - $3.0 billion
  - National Institutes of Health - $10.4 billion
  - Department of Energy - $3.1 billion
  - NIST - $600 million
  - NASA - $1.0 billion
- A Serious $21 Billion Effort to Boost R&D

Innovation Requires More than Just Inputs

The Myth of the Linear Innovation Model

The Myth of the Linear Model of Innovation

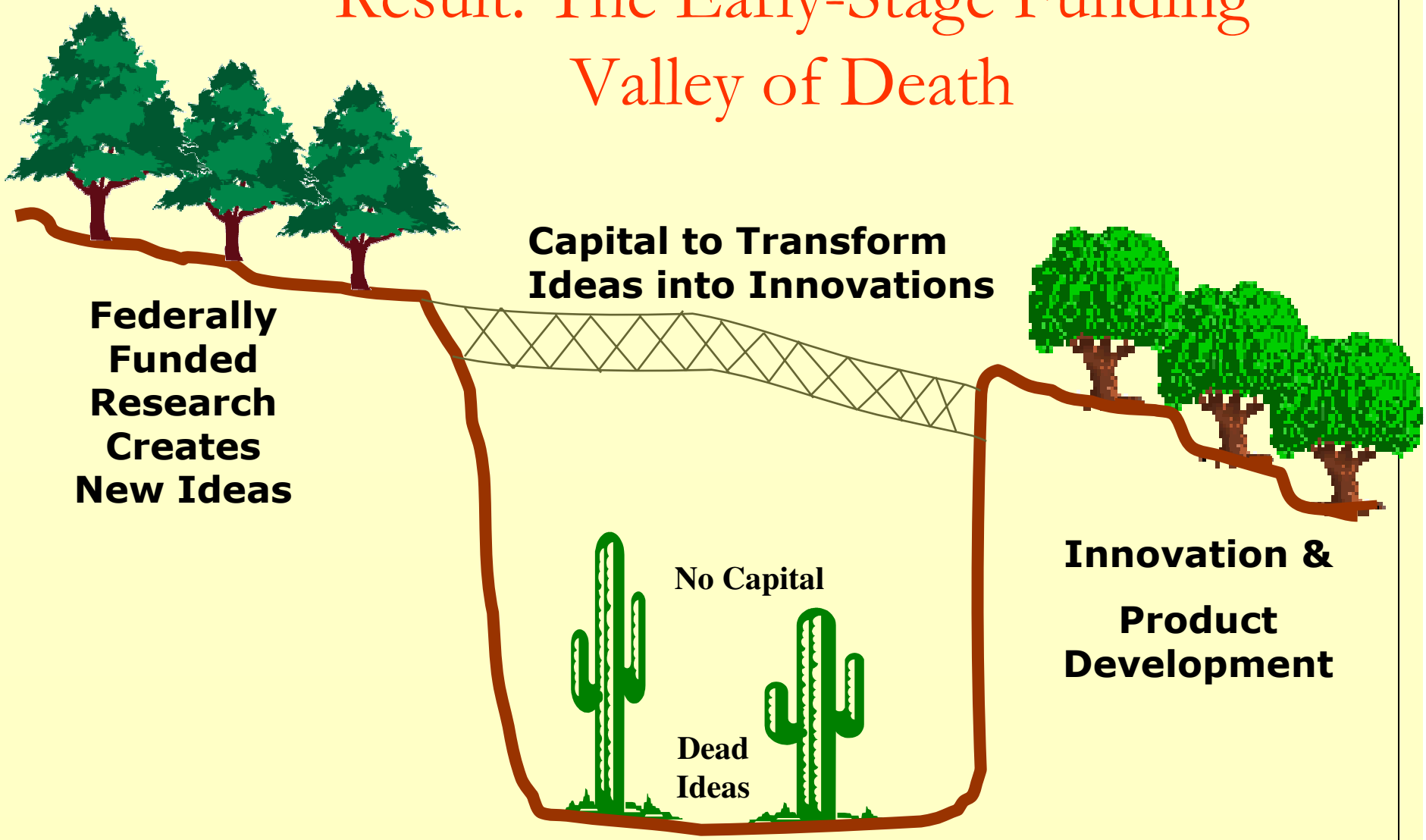


- Reality: Innovation is a Complex Process
  - Major overlap between Basic and Applied Research, as well as between Development and Commercialization
  - Principal Investigators and/or Patents and Processes are Mobile, i.e., not firm-dependent
  - Many Unexpected Outcomes
  - Technological breakthroughs may precede, as well as stem from, basic research
- Many of our policies and institutions remain based on this linear model

The U.S. Myth of Perfect Markets

- Strong U.S. Myth: "If it is a good idea, the market will fund it."
- Reality:
  - Potential Investors have less than perfect knowledge, especially about innovative new ideas
  - "Asymmetric Information" leads to suboptimal investments
    - George Akerlof, Michael Spence and Joseph Stiglitz received the Nobel Prize in 2001, "for their analyses of markets with asymmetric information"

Result: The Early-Stage Funding Valley of Death



Cross the Valley of Death: The Role of Innovation Awards

The Technology Innovation Program

The Small Business Innovation Research (SBIR) Program

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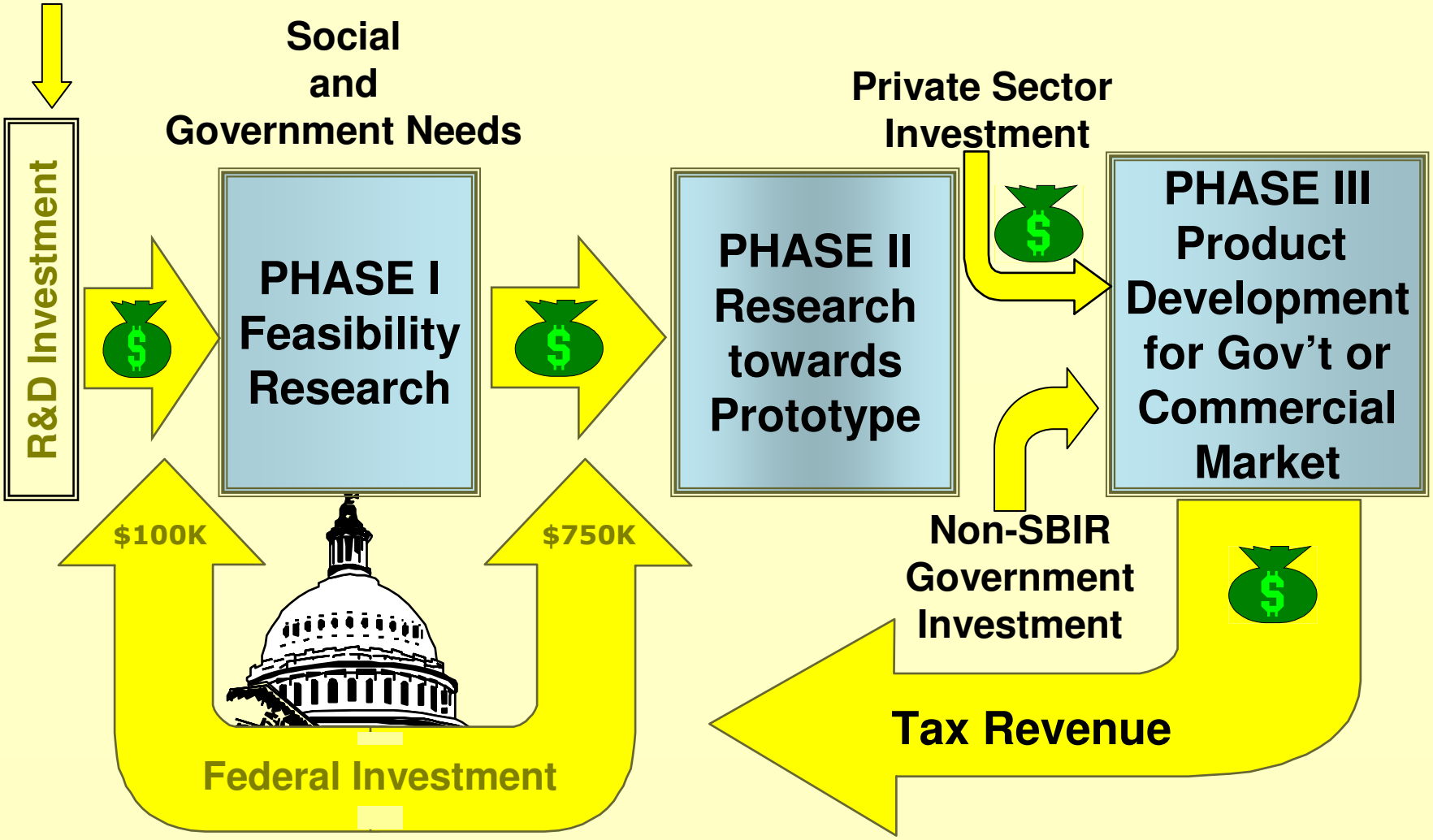
The Technology Innovation Program (TIP)

- Created by the 2007 America COMPETES Act
- TIP accelerates innovation through high-risk, high-reward research in areas of "critical national need"
  - Aim is to speed the development of high-risk, transformative research
  - Targeted to address key societal challenges
- TIP provides funding to small and medium-sized businesses, universities, and consortia for research on potentially revolutionary technologies
  - Awards are Merit Based
  - Funding provided through cost-shared research grants, cooperative agreements, or contracts

The Small Business Innovation Research (SBIR) Program

- Stable: in place since 1982 with steady growth
- Large Scale: Largest U.S. Innovation Partnership Program: Currently a $2.3 billion per year
- Focus: Funds Proof of Concept and Prototype
- Role: Helps firms across the Valley of Death and attract private capital or public contracts

The SBIR "Open Innovation" Model



Results of a 5-year, $5 million Study of the Operation of SBIR

"The SBIR program is sound in concept and effective in practice."

Key Finding of the National Academies' Recently Concluded 5-year, $5 million Assessment of SBIR

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SBIR Awards Have a Substantial Impact on Participating Companies

- **Company Creation**: 20% of responding companies said they were founded as a result of a prospective SBIR award—25% at Defense
- **Research Initiation**: SBIR awards played a key role in the decision to pursue a research project (70% claimed as cause)
- **Company Growth**: Significant part of firm growth resulted from award
- **Partnering**: SBIR funding is often used to bring in Academic Consultants & to partner with other firms

SBIR DOE: New Battery Technology

- The A123 Systems Story
  - 2003 SBIR award from the Department of Energy funded research on "an advanced cathode material for lithium-ion batteries."
  - SBIR was the company's first source of outside funding
- New battery technology combines unprecedented power, safety and long-life
  - applications for computers, power tools and – most significantly – for hybrid-electric vehicles
- New company has grown over five years—
  - Today employs over 1,100 people

The NAS Review "Mainstreamed" the Valley of Death & SBIR

- Fundamental impact of the NRC study was to "Mainstream the Program" in the policy dialogue by recognizing the "valley of death"
  - Seen less as a "Set-Aside" and more as an Enabler of Innovation
  - Endorsement by Primes at DOD and NASA
- Much greater focus and understanding of the challenges of Early Stage Finance and the need for appropriate policy support

New State-Based Initiatives in the U.S. Strengthen the Innovation Ecosystem

- Some 30 states have committed more than $2 billion in investment capital from pre-seed to later stage
- Examples include:
  - Michigan's Pre-Seed Capital Fund
  - New Mexico's State Investment Council
  - Pennsylvania's Ben Franklin Technology Partners
  - Arizona's 21st Century Competitive Initiative Fund

Some States leverage SBIR

- North Carolina has instituted one of the country's most substantial support programs for SBIR award winners
  - North Carolina awards up to $100,000 in matching funds to each company that won a SBIR grant from the federal government.
  - This approach reinforces support for high-potential small firms
    - Source: Robert McMahan, North Carolina Board of Science and Technology

New Analysis Underway of Clusters and Synergies Between State and Federal Programs

Meeting next week on Partnering for Photovoltaics Manufacturing in the United States

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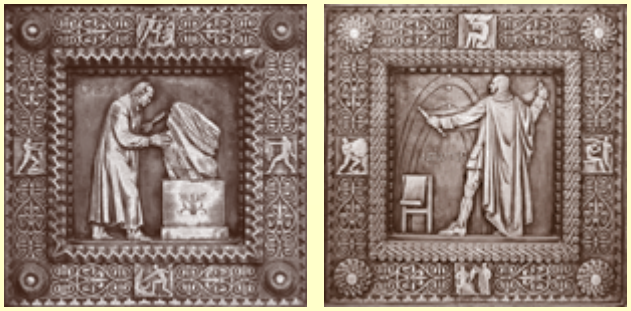
Thank You



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We now Understand SBIR Better!

- National Academies Reports on SBIR
  - SBIR: Challenges and Opportunities (1999)
  - SBIR: An Assessment of the DOD Fast Track Initiative (2000)
  - An Assessment of SBIR—Methodology Report (2004)
  - SBIR: Assessment Challenges and Program Diversity (2004)
  - SBIR: The Phase III Challenge of Commercialization (2007)
  - An Assessment of SBIR at DoD (2007)
  - An Assessment of SBIR at NSF (2008)
  - An Assessment of SBIR at NIH (2008)
  - An Assessment of SBIR at DoE (2008)
  - An Assessment of SBIR at NASA (2008)
  - An Assessment of the SBIR Program (2008)
  - Venture Funded Firms & the NIH SBIR Program (2009)
  - Revisiting the DOD SBIR Fast Track Initiative (Forthcoming)