

# Research Parks in the 21<sup>st</sup> Century

Promoting Innovation-Based Entrepreneurship



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The National Academies

# The National Academies



- National Academy of Sciences
  - Chartered by Congress in 1863
  - A self-perpetuating Honorary Society
- National Research Council (1916)
  - The Operating Arm of the National Academies
- National Academy of Engineering (1964)
- Institute of Medicine (1970)



# The Global Innovation Imperative

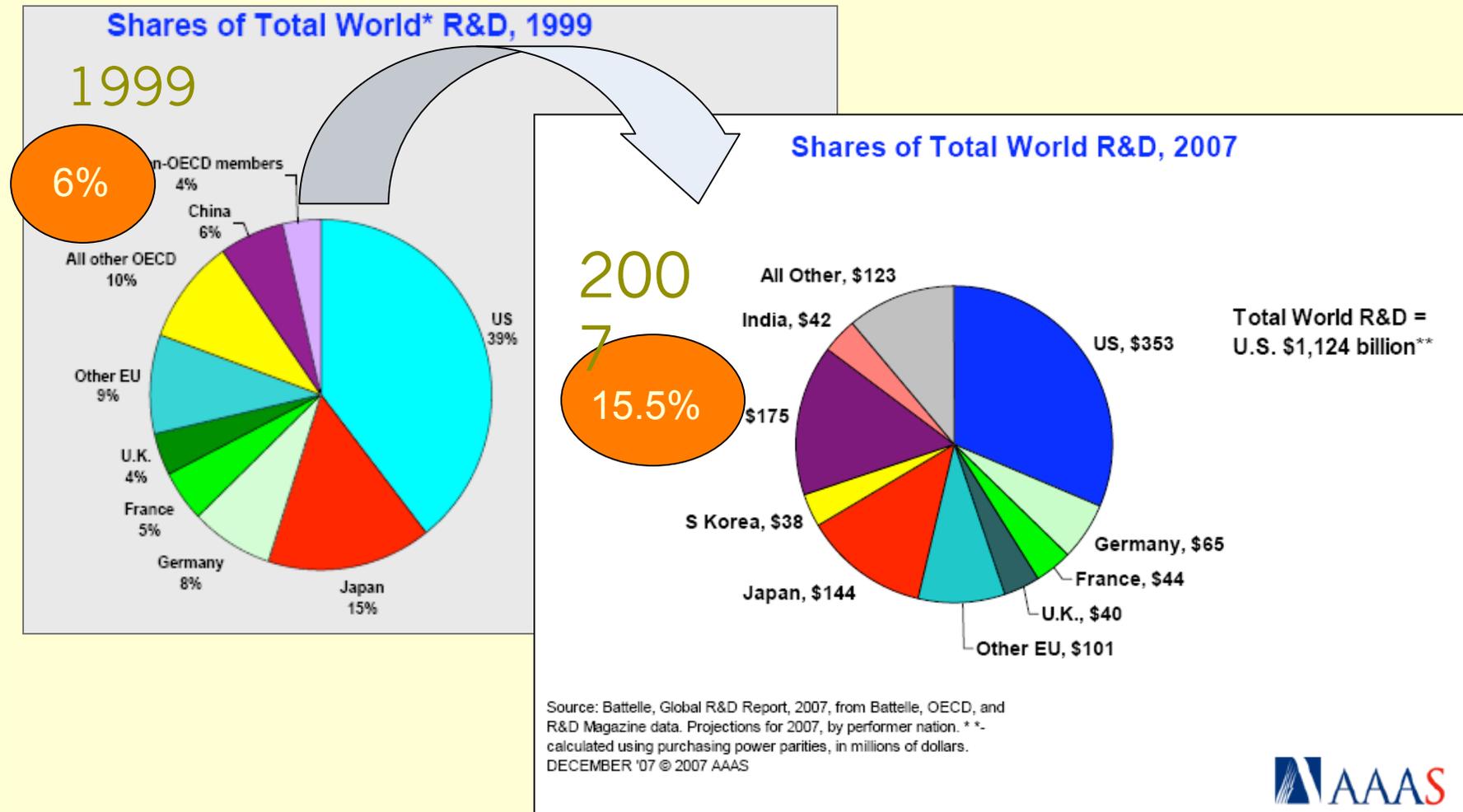
## 4 Key Points

- **Innovation** is widely recognized as key to growing and maintaining a country's competitive position in the global economy
- **Collaboration** is essential for innovation as small businesses and universities play a growing role in the innovation process
- **Institutional Change** is necessary to compete successfully
- **New Incentives** are required for change

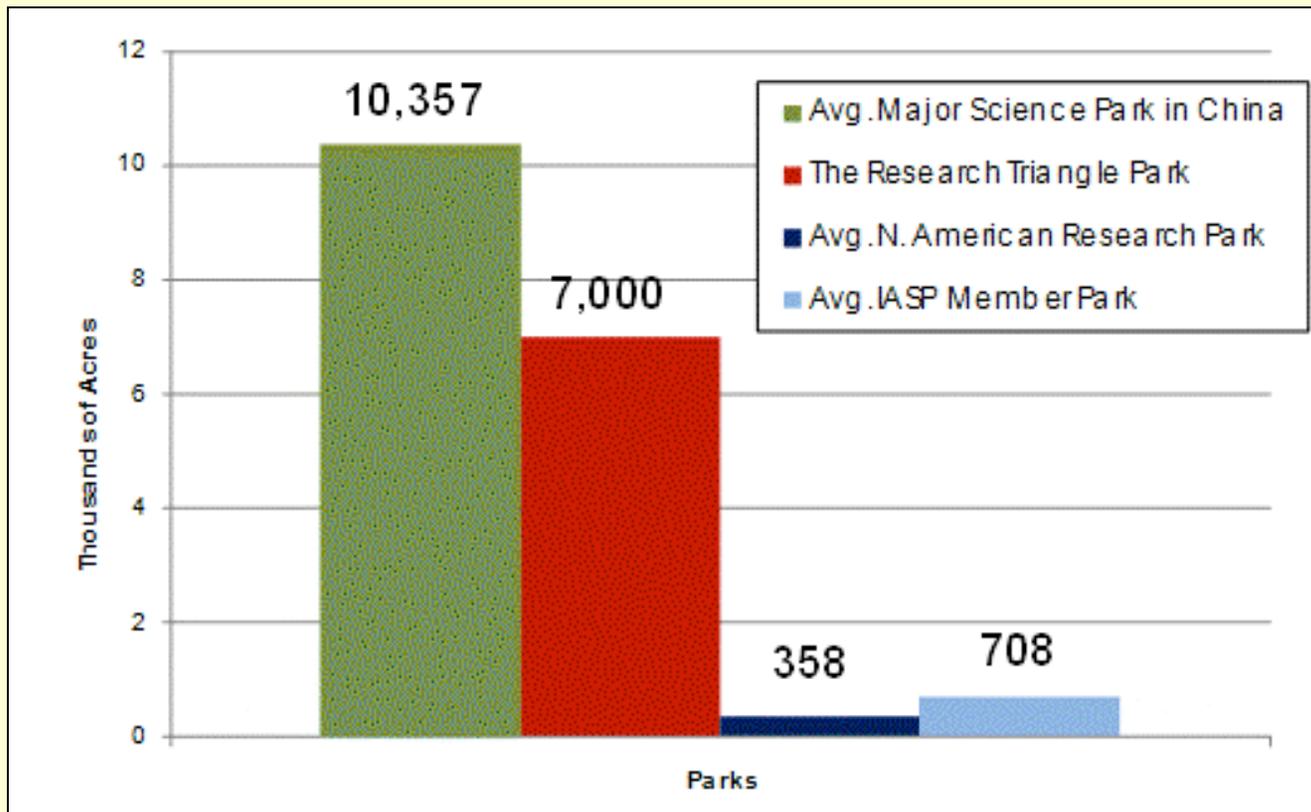
# How are Other Countries Addressing the Innovation Imperative?

- Many nations are adopting directed strategies to support innovation, with major emphasis on Research Parks
- Research Parks are widely seen as an important tool for innovation
- Many Parks receive significant support
  - Substantial public financial commitment
  - Policymakers see Parks as a key tool
  - High national profile and prestige

# China's Remarkable R&D Growth



# China's Mega Research Parks



- China has more than 54 state-level economic and technological development zones, and 53 national high-tech development zones

# Mega Parks in China: Examples

- ZHONGGUANCUN Science Park in Beijing
  - hosts over 20,000 enterprises and 950,000 employees, receiving total income of \$124 billion
  - Attracted almost 10,000 “sea turtles,” (skilled Chinese returnees) that have set up 4,200 companies in the park—**BIG NUMBERS!**
- SHANGHAI ZHANGJIANG Hi-Tech Park
  - accounts for a quarter of Shanghai’s GDP, half of its foreign trade, and a third of its foreign investment.
  - 25 square kilometers, established in 1992 in the middle of Pudong New Area
  - Host to more than 3,600 companies, more than 140 of them foreign, and more than 100,000 employees.

# Singapore's Innovation Strategy:

- Total Focus, Commitment, and Sustained Spending by the Government
  - Goal is to establish Singapore (population: 4.5 million) as Southeast Asia's preeminent financial and high-tech hub.
- Innovation Agency (A\*STAR) task, with \$5 Billion in funding, is to:
  - Invest in and attract a skilled R&D workforce
  - Attract major investments in pharmaceuticals and medical technology production
  - Invest in New S&T Parks—Biopolis & Fusionopolis
  - Develop new programs to address the early-stage funding challenge for innovative firms

# Singapore's Biopolis and Fusionopolis

- Biopolis
  - A 2.4 million square foot biomedical complex at a cost of \$400 million
  - Home to publicly-funded research institutes and research labs of pharmaceutical and biotechnological companies
- Fusionopolis
  - Additional 1.3 million square foot facility to house research organizations, high-tech companies, government agencies, retail outlets, and serviced apartments
- Both are located close to Singapore's leading universities

# Other Nations are Making Major Investments in Research Parks: 2 Examples

- France

- Development of a Research Park in Grenoble benefitted from a 3.2 billion Euro investment from the French government
- Local government paid 150 million Euros to improve infrastructure
- Created over 1,000 technical jobs and over 3,000 support jobs
  - David Holden, Minatec, France

- Mexico

- New 175 acre Research Park underway in Monterrey
- Equipment and infrastructure investments of over \$250 million
- Mexico absorbs 30 percent of annual R&D expenses as tax incentives for investors
  - Jaime Parada, National Council on Science and Technology of Mexico

# What about the United States?

The 2008 AURP/National Academies Conference highlighted the role that Research Parks play in addressing the Innovation Imperative abroad and at home

# Key Challenges for the United States

- How do we transform investments in R&D into competitive new products for the market?
- How can we encourage collaboration among innovative small and large companies, universities, and national laboratories to stimulate growth and employment?
- How do we meet the locational competition for investment in the industries of today, as well as the industries of tomorrow?

# Research Parks are a Part of the Answer

- Research Parks **stimulate and manage the flow of knowledge** among universities, R&D institutions, firms and markets
- They facilitate the **creation and growth of innovation-based companies** through spin-off and incubation
- They provide **value-added services** together with high quality space and facilities
- They help create a “**Community of Innovation**” needed to transfer new ideas from universities and laboratories into the marketplace

# S&T Parks are a Proven Catalyst for Regional Development

- Well-conceived, well supported S&T Parks can
  - Build partnerships among researchers, small companies, and large companies
  - Advance university missions
  - Help create companies
  - Increase public support and help justify increases for university funding



# Research shows that Research Parks help advance University Missions

- Parks help accelerate the commercialization of new knowledge
  - Linked to higher patenting rates
- Parks enhance the university's research role
  - Higher publication rates for faculty and students
  - Ability to hire eminent faculty
  - Attract larger extramural grants
- Parks draw in and motivate students to follow careers in Science, Technology, and Engineering
  - Students gain experience as interns, research collaborators
  - Firms provide jobs on graduation
- Source: Albert N.Link and John T. Scott
  - (2006) "U.S. university research parks," Journal of Productivity Analysis
  - (2005) "Opening the ivory tower's door: An analysis of the determinants of the formation of U.S. university spin-off companies, " Research Policy

# Views of 2 University Presidents

- Dr. C.D. Mote (Univ. of Maryland)
  - Parks expand University's Reach into the community
  - They help the University to partner with local industry and federal laboratories
  - Contribute to laboratory missions, regional growth
- Dr. James Barker (Clemson University)
  - Parks promote research collaboration
  - Collaboration nurtures local competitive advantage—e.g.: Clemson's International Center for Automotive Research (ICAR)
  - Collaborative Research Facilities attract world-class faculty to the University

# Parks Can Advance the Missions of National Laboratories: The Views of 3 Laboratory Leaders

- **Richard Stulen (Sandia Labs)**
  - Parks stimulate joint R&D activities, commercialize technologies
  - Strengthen Sandia's supplier-base
- **Pete Worden (NASA Ames)**
  - Helps draw tacit knowledge and technological capabilities of Silicon Valley to advance NASA missions
- **John Neiderhuber (National Cancer Institute)**
  - Parks widen NCI's knowledge base
  - Create opportunities for industry partners to develop marketable applications of investments in cancer research

# Building Better Research Parks

Critical Mass  
Leadership  
Patience  
Evaluation

# Key Factors for Successful Research Parks

- **Critical Mass**
  - Presence of a Strong Science and Industry Base
  - Involvement of a Local Major Research University
  - Availability of Skilled Workers
  - Access to Finance
  - Good Park Infrastructure and Quality of Life Amenities
- **Leadership**
  - Committed Champions
  - Strong and Committed Park Leadership
  - Presence of Entrepreneurs and Skilled Managers
- **Patient and Supportive Public Policies**
  - Predictable, Substantial, and Sustained Funding
  - Bridging Institutions to sustain vision over the long term

# Need for Complementary Programs

- States can maximize their investments in Research Parks through support for entrepreneurship and innovation
  - Help Universities and Firms in the Research Park Commercialize new products
- SBIR is a Key Example
  - The Small Business Innovation Research Program (SBIR) provides Early State Funding to small innovative firms
  - States can leverage SBIR for local growth by assisting park residents to apply for SBIR and by providing matching grants to SBIR award winners

# Conclusions

## Global Competition and the Innovation Imperative

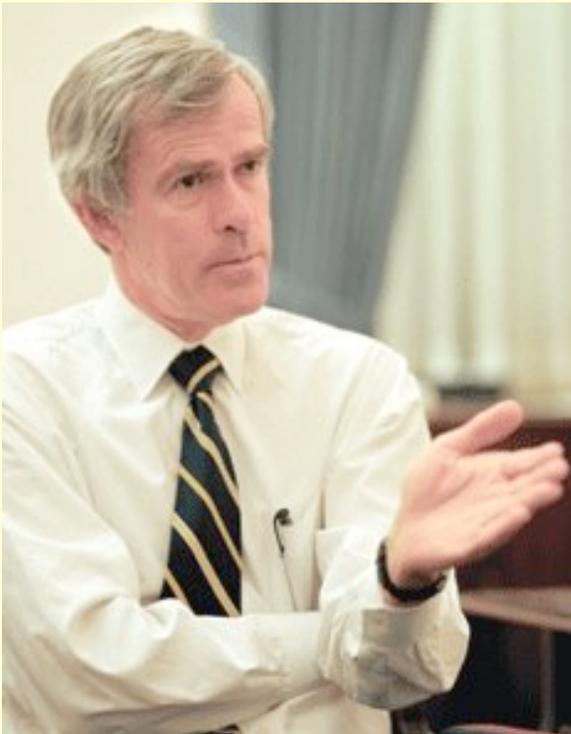
# Parks are a Proven Innovation Tool

- Research Parks are a proven tool to increase the return on a nation's investments in education and R&D, and to raise competitiveness
- Effective parks can
  - aid in the transfer of technology and business skills between university and industry teams,
  - encourage the creation of start-ups, and
  - promote technology-led economic development for the community or region

# Parks are now a Worldwide Phenomenon

- Other countries get this!
- As a part of their national innovation strategies governments around the world are building and expanding research parks to
  - Facilitate the commercialization of new technologies
  - Attract leading technology companies from abroad
  - Benefit and contribute to university research
  - Develop centers of regional and national economic development
- They often benefit from significant financial and policy support from national & state governments.

# No Comparable Coordinated Effort is Under Way in the United States



“Many other countries have been able to use the mechanism of S&T parks to greatly advance their technological capabilities.

**We have not given it nearly the emphasis as other countries.**

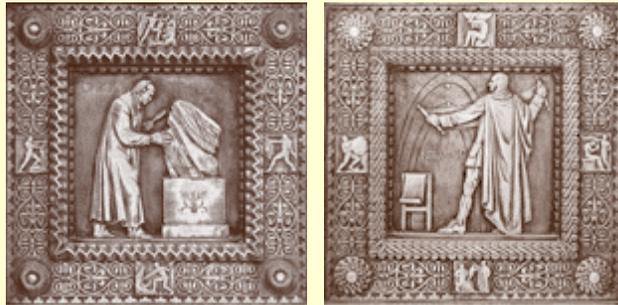
I would like to see the government provide more assistance to make Research Parks a priority.”

Sen. Bingaman’s Keynote Remarks at the National Academies Symposium

# What are the Implications for the U.S.?

- The U.S is in a new, unprecedented globally competitive environment
  - The U.S. cannot take its leadership in innovation for granted
- In the United States support for research parks is principally undertaken by state and local governments
  - Many state governments are experimenting with technology zones to support research parks and technology incubators
  - Only limited participation by the federal government
- Should the U.S. government pursue a more comprehensive strategy to build high tech clusters to drive economic growth and national competitiveness?

# Thank You



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