

Research Parks in the 21st Century

Promoting Innovation-Based Entrepreneurship



September 22, 2009

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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

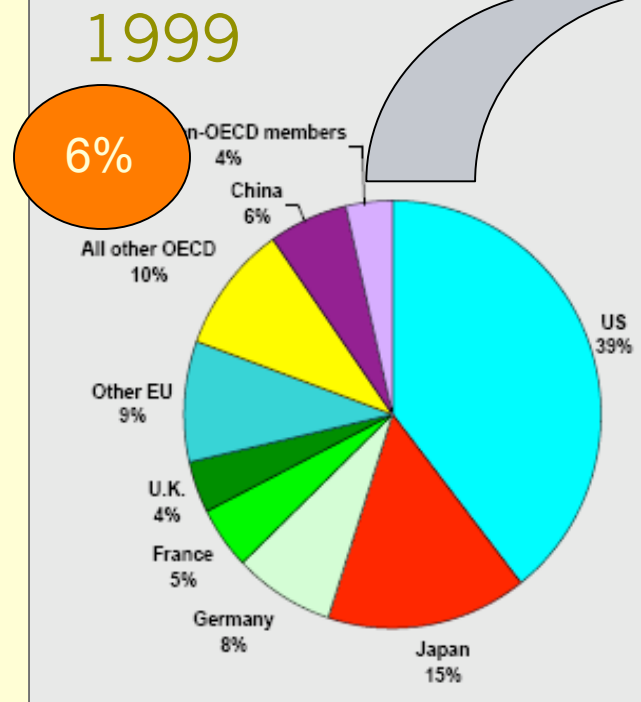
- **Innovation** is widely recognized as key to growing and maintaining a country's competitive position in the global economy
- **Collaboration** is essential for innovation as small businesses and universities play a growing role in the innovation process
- **Institutional Change** is necessary to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

How are Other Countries Addressing the Innovation Imperative?

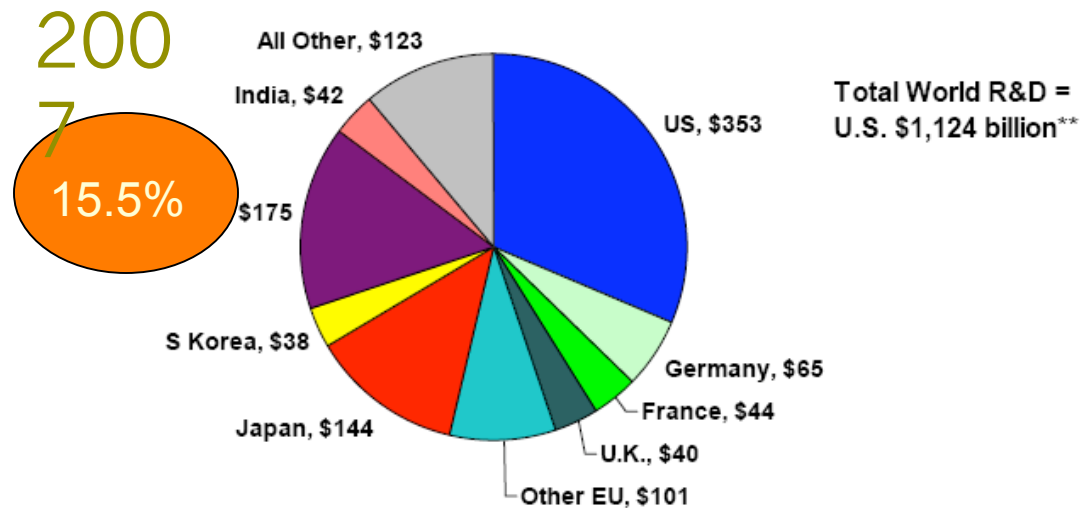
- Many nations are adopting directed strategies to support innovation, with major emphasis on Research Parks
- Research Parks are widely seen as an important tool for innovation
- Many Parks receive significant support
 - Substantial public financial commitment
 - Policymakers see Parks as a key tool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

China's Remarkable R&D Growth

Shares of Total World* R&D, 1999



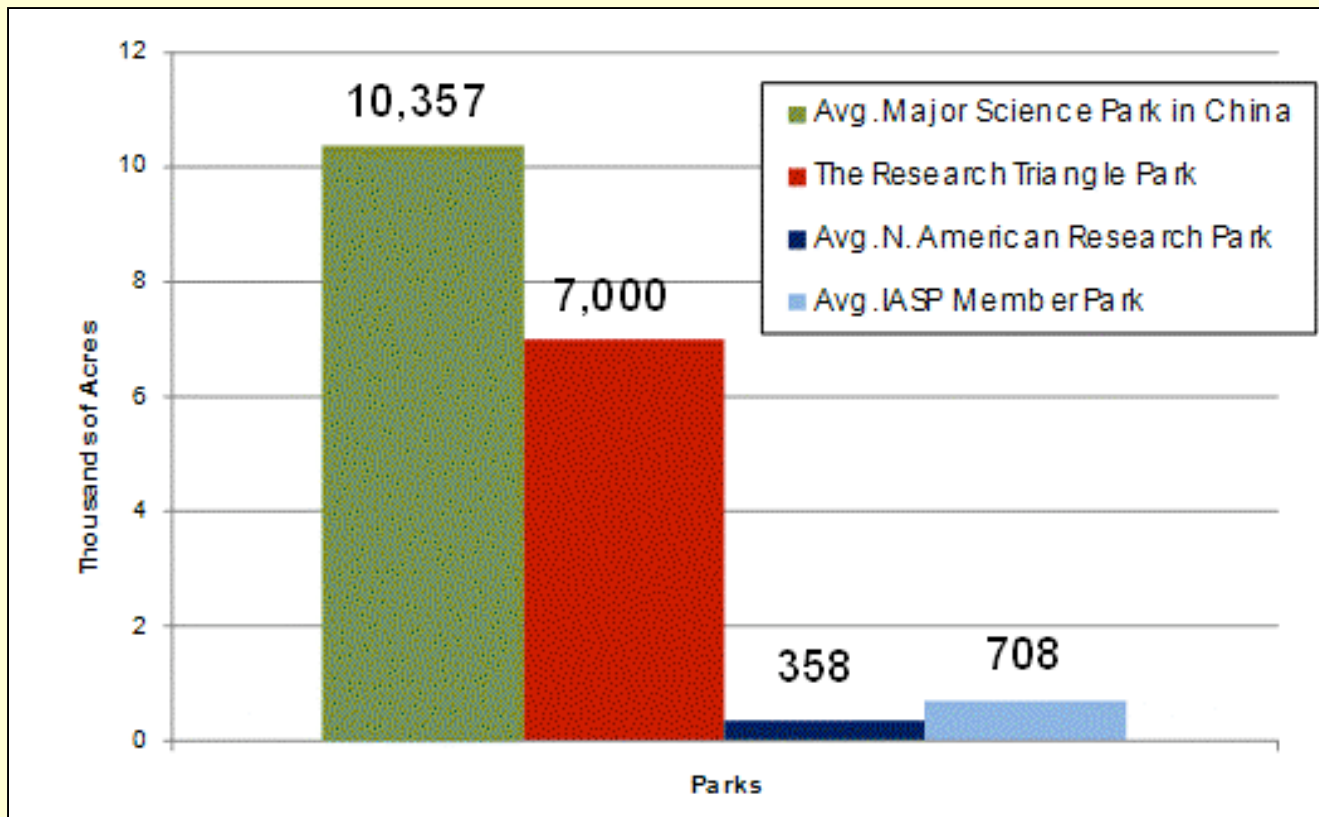
Shares of Total World R&D, 2007



Source: Battelle, Global R&D Report, 2007, from Battelle, OECD, and R&D Magazine data. Projections for 2007, by performer nation. ** - calculated using purchasing power parities, in millions of dollars. DECEMBER '07 © 2007 AAAS



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.

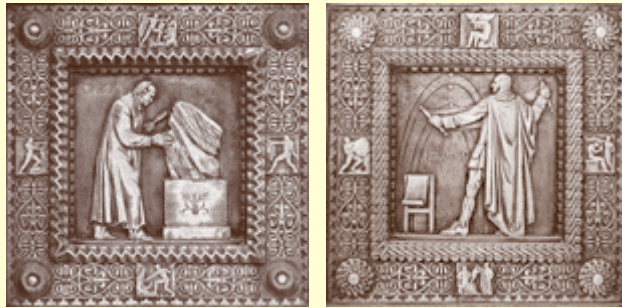
I would like to see the government provide more assistance to make Research Parks a priority.”

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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