



---

## CHINA'S TECHNOLOGY SECTOR

*A Report Prepared by the Federal Research Division,  
Library of Congress  
under an Interagency Agreement with the  
Director of Defense Research and Engineering,  
Office of the Secretary of Defense*

*September 2008*

*Author: Peggy S. Christoff*

*Project Manager: Malinda K. Goodrich*

**Federal Research Division  
Library of Congress  
Washington, D.C. 20540-4840**

**Tel: 202-707-3900**

**Fax: 202-707-3920**

**E-Mail: [frds@loc.gov](mailto:frds@loc.gov)**

**Homepage: <http://www.loc.gov/rr/frd/>**

## TABLE OF CONTENTS

PREFACE.....	i
KEY FINDINGS.....	1
INTRODUCTION .....	7
OVERVIEW OF CHINA'S POLITICAL SYSTEM .....	9
The National People's Congress and the Presidency.....	10
Premier of the State Council.....	10
National Party Congress .....	11
OVERVIEW OF CHINA'S S&T POLICY.....	12
Economic Investment.....	12
Social Investment.....	13
Political Investment .....	19
CHINA'S R&D ESTABLISHMENT.....	21
History of Chinese R&D Programs .....	21
<i>R&amp;D Performers</i> .....	22
<i>863 Program</i> .....	23
<i>973 Program</i> .....	24
<i>Knowledge Innovation Program</i> .....	24
<i>Torch Program</i> .....	25
<i>Zhongguancun Technology Park</i> .....	25
<i>National Program 2006–2020 for the Development of Science and Technology         in the Medium and Long Term</i> .....	26
R&D Governance.....	28
S&T Benchmarks.....	30
<i>Funding of Chinese R&amp;D</i> .....	31
<i>Scientific Personnel</i> .....	33
<i>Patent Applications and Scientific Publications</i> .....	33
CHINA'S TECHNOLOGY SECTORS .....	35
Cutting-Edge R&D .....	35
<i>Nanotechnology</i> .....	35
<i>Biotechnology</i> .....	37
Energy and the Environment .....	39
China's Space Program.....	42
Advances in Military Technology .....	46
<i>Military Aviation</i> .....	49
<i>Missile Technology</i> .....	49
<i>Shipbuilding</i> .....	51
<i>Defense Electronics</i> .....	52

Telecommunications .....	53
Regional Trends in Information Technology.....	54
<i>Shanghai</i> .....	55
<i>Beijing</i> .....	55
<i>Guangzhou</i> .....	56
<i>Xi'an</i> .....	56
Semiconductors.....	58
CHINA'S INTERNATIONAL ROLE .....	59
Technology Transfer.....	60
Academic Exchanges .....	61
CONCLUSION.....	65
APPENDIX A.....	67
APPENDIX B .....	69
APPENDIX C .....	75
APPENDIX D.....	77
BIBLIOGRAPHY.....	83
<b>TABLES</b>	
Table 1. Programs Established to Strengthen China's Human Resources Base in S&T .....	14
Table 2. Factors Slowing Development of China's Human Resources.....	17
Table 3. Chinese Ministries Involved in R&D .....	30
Table 4. Percentage of Patents Granted to Domestic and Foreign Firms in China by Type of Activity, 1997 and 2000 .....	34
Table 5. CNKI Nanotechnology Articles, 2000–2007.....	36
Table 6. CNKI Biotechnology Articles, 2007 .....	38
Table 7. Regional Differences in China's IT Industry.....	58
Table 8. Dates Countries Became Members of Selected International Organizations .....	60
Table 9. Chinese Knowledge Transfer from International Exchange.....	63
<b>FIGURES</b>	
Figure 1. Regional GDP Per Capita and Regional Shares of Total R&D Expenditures .....	32
Figure 2. Timeline of China's Space Program.....	43
Figure 3: Estimated Funding of China's Military R&D and S&T (US\$ billion), 2003–2005 .....	47