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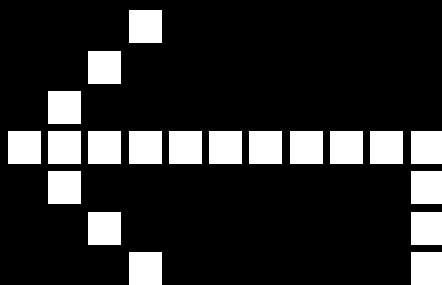
RESEARCH

THINK

CHINA'S OUTWARD
INVESTMENT FLOWS

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重新



思考

中国境外投资

全球工厂正在改变地球的面貌

既是在全球经济中寻觅自然资源的举措, 又是中国成为可持续发展推力源泉的独特机遇

本报告是世界自然基金会贸易与投资政策项目系列研究成果的一部分内容。世界自然基金会贸易与投资政策项目旨在确定和联合主要的新兴经济体（中国、巴西、印度、俄罗斯和南非）中的相关各方，共同推动国际可持续性贸易与投资事业；同时考查在日渐崛起，成为国际可持续发展行动的主要推动力量的过程中，这些国家在可持续性产品和服务的出口和投资领域发展成为国际领导者的潜在余地。

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This abridged report is part of a series of studies by WWF's Trade and Investment Policy Programme, which aims to identify and cooperate with actors in the BRICS group of key emerging economies (Brazil, Russia, India, China and South Africa) to champion international sustainable trade and investment. The Programme examines the scope which exists for these countries to become leading exporters of, and investors in, sustainable goods and services, whilst emerging as key actors in promoting a proactive international sustainable development agenda.

Full report available at www.panda.org/investment

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ABBREVIATIONS

APERC: Asia Pacific Energy Research Centre
BCEGC: Beijing Construction Engineering Group Corporation
CITIC: China International Trust and Investment Corporation
CNOOC: China National Offshore Oil Corporation
CNPC: China National Petroleum Corporation
CPPLB: China Petroleum Pipeline Bureau
FDI: Foreign Direct Investment
G77: Group of 77
G24: Group of 24, a chapter of the G-77
GDP: Gross Domestic Product,
IBSA: India-Brazil-South Africa
IFC: International Finance Corporation
IPR: Intellectual Property Rights
M&A: Mergers and Acquisitions

MIGA: Multilateral Investment Guarantee Agency
MOFCOM: Ministry of Commerce
NDRC: National Development and Reform Commission
OECD: Organisation for Economic Co-operation and Development
R&D: Research and Development
SASAC: State Asset Supervision and Administration Commission
SOE: State-Owned Enterprise
SAFE: State Administration of Foreign Exchange
TNC: Transnational Corporations
UNCTAD: United Nations Conference on Trade and Development
UNDP: United Nations Development Programme
UNEP: United Nations Environment Programme
UNIDO: United Nations Industrial Development Organization

SUMMARY OF KEY FINDINGS IN THE REPORT

报告中关键研究发现摘要

The findings of this report are gathered under three headings: First, key factors regarding the situation in China; second, the relationship between China and the world; and third, Chinese outward investments as an indicator of global sustainability. These key findings are addressed in Chapter Five, entitled ‘Possible Ways Forward’.

摘要报告按3个标题分列这些研究发现：第一，关于中国形势的关键因素；第二，中国和世界的关系；第三，中国境外投资成为全球可持续性的一个指标。第5章：“可能的前进道路”详细地讨论这些关键的研究发现。

CHINA

- China’s outward Foreign Direct Investment (FDI) grew on average 65.6 percent per annum from 2000 to 2005.¹ Official estimates from the United Nations Industrial Development Organization (UNIDO) Director-General, show that China’s overseas investments are likely to reach US\$ 60 billion by 2010.²

One look at the largest corporations in the world and a single conclusion jumps out: Natural resources are driving the global economy as never before.

Fortune, 26 July 2006

- Within its own borders, China possesses very few natural resources per capita compared to most developed countries.³
- China recently launched its 11th Five-Year Plan (2006-2010). In this Plan, strong emphasis is placed upon a harmonious society.⁴ Resource efficiency, global responsibility and reduced environmental destructions are three of the cornerstones of the new Plan.⁵

中国

- 在2000年到2005年期间，中国的对外直接投资年均增长率达到65.6%^a。联合国工业发展组织总干事给出的官方估计数据表明，到2010年以前，中国的海外投资有可能达到600亿美元。

当我们对全球最大的一些企业进行研究时，我们很快发现：自然资源对全球经济的推动作用大到前所未有的。

《财富》杂志，2006年7月26日

- 同大多数的发达国家相比，在中国国内的人均自然资源占有量很少^b。
- 中国最近开始实施“十一 五计划（2006–2010年）”。在这个五年计划中，特别强调要建设和谐社会。资源效率、全球责任和减少环境破坏是这个新五年计划的三大基石^c。

CHINA AND THE WORLD

- The current unsustainable consumption patterns in developed countries are spreading to other parts of the world, thereby triggering a global hunt for natural resources.⁶ As China's population grows richer, this demand for natural resources will increase if the country follows, or is pushed by international actors towards, a western industrialisation model.⁷
- China can satisfy its natural resource demand either through purchases on international commodity markets, or through outward investments that secure ownership of those companies that supply these resources. The greater the tension and insecurity surrounding access to natural resources, the greater the incentives for outward investments into the countries in which these resources are located.⁸
- Much of the natural resources imported to China are re-exported in the form of value-added inputs or final products for consumption in other countries. This export is to a large degree dominated by foreign firms.⁹ This trend has recently been highlighted by Chinese experts. In a report entitled "Review and Perspective of the Environment and Development of China" it is noted that China is often perceived as posing a threat to tropical forests due to its timber imports from Southeast Asian countries. In fact, over 70 percent of this timber is processed into furniture and exported to the United States and European Union.¹⁰
- Outward investments are supported by a number of new policies being implemented in China, forming part of a strategy known as 'going global'.¹¹ A number of elements of this strategy encourage movement up the value chain. At the same time, few policies exist in developed countries to support China and other emerging economies in their attempts to move towards more resource-efficient societies.¹²
- Resource-rich countries are attempting to attract investments in infrastructure and production facilities aimed at beneficiating the natural resources they possess.¹³ These resource-rich countries are generally classified as developing or even least-developed, and are often under pressure from foreign debts they are required to repay. In some cases such countries are also controlled by dictatorial regimes with little interest in lifting their own populations out of poverty.¹⁴ If executed in a strategic manner, the utilisation of natural resources can therefore provide a means for countries to move up the value chain and at the same time ensure long-term sustainable protection of natural habitats.¹⁵ For the latter to occur, it is often necessary for foreign investors to support strong regulation that protects the rights of the poor as well as nature.
- The manner in which Chinese outward investments are guided and promoted will have significant implications for the development of the global governance system. The global

quest for natural resources is closely linked to questions of poverty alleviation, corruption, transparency, regulations of transnational corporations, and human rights.¹⁶ The degree to which the Chinese government and corporate sector are supported by foreign governments and businesses as they engage in these issues will be of great importance.

- Chinese outward investment that is intended to secure natural resources often occurs in geographically sensitive and/or politically controversial locations, due to the fact that many of the easily accessible and non-controversial locations in which these resources occur, are already controlled by predominantly Western multinational companies.¹⁷
- Developed countries have for the most part expressed little willingness to assume responsibility for distributing resources more equitably, or for investing in innovative solutions that provide welfare with low consumption of natural resources, and thereby assist in lifting the world's population out of poverty without leading to conflict over natural resources and collapsing ecosystems. Furthermore, developed countries generally do not even have systems in place to monitor the impacts of their consumption in those countries that provide them with natural resources.
- According to recent studies, many of the products being consumed in developed countries, that utilise large amounts of natural resources, do not result in increased well-being or even short-term satisfaction for those who buy them.¹⁸ China is currently in danger of developing into a similar consumption-driven society, but it is clear from the 11th Five-Year Plan that the country's government is actively seeking alternatives to this scenario.¹⁹

中国和世界

- 目前，富裕国家中的不可持续的消费模式正在向世界其余地方传播，已经引起了一场寻找自然资源的全球性狂潮。随着中国人逐渐地富裕起来，如果他们追随，或者在国际参与者的推动下卷入这股狂潮，效法西方工业化模式^d，对自然资源的需要量也将会不断地增加。
- 中国可以通过到国际市场上购买自然资源，或者通过进行境外投资，获得供应资源的公司的所有权来确保安全的供给等手段来满足自己对自然资源的需要。有关获得自然资源的严峻状态和不安全感越强烈，通过境外投资获得自然资源而不是在世界市场上购买自然资源的冲动就越强烈^e。
- 中国进口的自然资源绝大部分经过加工处理或者制造成最终产品后，再按较高的价值出口给其它国家消费。外国公司在这种出口活动中占有很大的支配地位^f。
- 中国当前实施的许多新政策都支持境外投资，这正是所谓“走出去”战略的一部分内容。这项政策的许多内容都鼓励向价值链的上游转移。而另一方面，在发达的国家中却几乎没有相关的政策，支持中国和其它新兴经济体向资源节约型的社会转化^g。
- 资源富裕型国家正努力吸引基础设施和生产设施投资，以利用自己所拥有的自然资源。这些资源富裕型国家通常都很贫穷，还要承受着还债的压力，在有些情况中，还受到根本不在乎人民死活的统治者的控制。以战略性的眼光来利用自然资源可能是向价值链上游转移和确保长期可持续性地保护自然的一种方式^h。而要实现长期可持续性地保护自然这个目的，投资者通常都需要向这些国家证明自己支持采取强有力的管理规定，保护穷人权利和保护自然。

- 中国采用什么方式来指导和促进境外投资，这将对全球治理体制的发展具有重大的意义。全球寻找自然资源的狂潮同许多问题密切相关，如脱贫、腐败、透明、跨国公司监管和人权¹。外国政府和公司采用什么方式支持中国政府和中国公司参与解决这些问题，这具有非常重要的意义。
- 由于能方便容易地获得自然资源，而又没有政治争议的许多地方已经控制在西方公司/国家的手中，因此，中国意在获得自然资源的境外投资经常投向在地域敏感和/或政治上有争议的地方。
- 迄今为止，这些富裕国家还没有传达出任何信号，表明自己愿意承担责任，共享资源和投资探寻自然资源消耗低、造福人类的创新型解决方案，既能用于帮助世界人口摆脱贫困，而又不会引发有关自然资源的冲突和损伤生态系统。富裕国家目前没有采取任何措施来追踪自己的消费对自然资源提供国的影响。
- 据近期的研究²，富裕国家消费的许多产品虽然消耗了大量的自然资源，但却并没有提升购买者的福利，或者甚至给购买者带来短期的幸福。目前，中国正在朝着类似的社会发展，但是却也正在探寻其它的途径，这种观点在“十一 五计划”中体现得非常明确。

CHINESE OUTWARD INVESTMENT AS AN INDICATOR OF GLOBAL SUSTAINABILITY

- Chinese outward investments can be viewed as an indicator of the state of the global economy.²⁰ As a result, decisions regarding the continuation of resource-intensive development, or alternatively attempts to increase welfare through resource-efficient means, will be reflected in the direction and scale of future Chinese outward investment.
- Chinese outward investments will affect the way in which the global economy will develop. The investments occurring at present are to a large extent driven by a Western industrial development model. Unless a new development path for the global economy is found, Chinese outward investments will continue to contribute to the ongoing environmental degradation caused by this development model.²¹
- Chinese infrastructure and investment patterns are currently being developed and implemented.²² This presents a window of opportunity to put in place a structure that ensures that both government and business policies in China support long-term sustainable development. This window will however close gradually over the next two decades. The choice to support a sustainable infrastructure and industrial development in China, or not, is therefore a choice between, on the one hand, finding ways to develop new production and consumption systems and, on the other, fighting over the natural resources of the planet.²³
- Often, smaller outward investment flows are ignored in international discussions. However, such smaller investments can have significant environmental and social impacts, both positive and negative, in developing countries. As an example, countries in Africa, such as Tanzania, are affected both positively and negatively by Chinese outward investment that is relatively insignificant in international terms.²⁴

中国境外投资是全球可持续性的指示标

- 中国境外投资可以作为全球经济状态的一个指示标。我们的发展是否继续沿袭资源密集的旧模式，或者，我们是否找到新的途径，用资源节约的方式来促进福利，这在中国境外投资中都会被反映出来。
- 中国境外投资将会影响着地球的面貌和全球经济发展的方式。目前，各种投资活动在很大程度上都是受西方工业发展模式的驱动。除非全球经济找到新的发展道路，否则，中国境外投资将会加入破坏地球外表的狂潮^k，这种破坏狂潮由一些老牌工业经济体率先启动，而目前仍在持续地进行。
- 目前，中国基础设施和投资模式正在逐步建立就位^l，这就为确保政府和企业政策能确保长期的可持续发展打开了机会之门。这扇机会之门在今后的20年中将逐渐地关闭。我们将不得不为获得这个星球上的自然资源而相互争战？还是另辟途径，建立新型的生产和消费体制？我们需要在两者间作出抉择。
- 在国际讨论中，规模较小的投资流经常被人们忽视了。然而，许多规模较小的投资却具有重大的环境和社会影响，给贫穷国家既带来积极的影响，也产生不良的影响。非洲一些国家，如坦桑尼亚，就受到中国境外投资的正负双向影响^m。

1.

INTRODUCTION²⁵

Two hundred years ago, China was the largest economy on earth, and in a few decades, the country will most certainly reclaim that position. There can therefore be little doubt that the future of China will shape the global economy; the question is, in what direction?

This report sets out to examine one of the greatest challenges in the 21st century, namely, how to combine global economic development and a sustainable use of natural resources.

The objective is to encourage a constructive discussion regarding the rapidly increasing outward investment flows from China, from a global sustainability perspective. The report explores the roles of the different actors involved and the manner in which the underlying trends driving this outward investment can be directed to ensure sustainable resource use.

The rapid rise of China as an outward investor, particularly in resource extraction, is noteworthy: its average annual outward FDI flows grew from \$450 million in the 1980s to \$2.3 billion in the 1990s, and its outward FDI stock was estimated at \$37 billion by end 2003. Chinese TNCs invest not only in neighbouring countries, but also in Africa, Latin America, North America and Europe.

World Investment Report 2004

A key driver of Chinese outward FDI is the country's growing demand for natural resources, as suggested by its investment projects in this sector in Latin America and Africa.

World Investment Report 2006

China's overseas investment to reach US\$60 billion in 2010.

Headline, Xinhua news, 9 September 2006

Given China's role as the manufacturing 'factory' of the world, Chinese outwards investments are relevant not only for the direct impact they have and the opportunities they provide, but also as an indicator for the world economy. For example; a more sustainable global economy would result in increased demand for cheap sustainable services, something that would result in more Chinese outward investment in high-technology and service sectors to ensure distribution of resource-efficient solutions. On the other hand, a less sustainable global economy will result in more investments to secure natural resources. Similar patterns will be seen for all emerging economies, but China's role as the global factory make the Chinese investment flows the best indicator. In this way the nature of Chinese outward investments will indicate whether the global economy will continue to develop along a traditional, resource-intensive model of industrialisation, or whether new models of welfare provision can be developed.²⁶

Six assumptions that will be discussed in more detail below are used as the starting point for the report. They are as follows:

1. China can be described as the manufacturing ‘factory’ of the world. While the reality is much more complex, it is true that much of the production capacity in China exists to meet the demand for products from primarily OECD countries.
2. The amount of natural resources available per capita in China is, in most cases, far below the international average. As the per capita income increases, it is therefore necessary to look outside the country to obtain the resources required to meet the growing demands of the population.
3. Outward investments in natural resources can support sustainable development in other parts of the world, if carried out in an appropriate manner. There is, however, a limit to the amount of natural resources that can be consumed, and on a global level there already exists an over-consumption of natural resources.
4. Outward investments in service sectors and high-technology industries can assist in promoting innovation and thereby moving towards a global circular economy in which consumption patterns provide a higher quality of life with far lower consumption of natural resources. It is therefore necessary to discuss Chinese outward investment in a broader context, in which these investments also can contribute to a reduced requirement for natural resources.
5. The primary responsibility for solving the problem of high levels of consumption of natural resources lies with developed countries, in which the per capita usage of resources is particularly high, as are the economic opportunities to invest in sustainable production systems, both domestically and in China.
6. China has a responsibility to ensure that its investments in countries that provide natural resources also assist these countries in achieving domestic, long-term sustainable development.

Two key challenges exist in relation to global investment flows and global resource use. First, there exists a requirement to ensure that investments aimed at securing sources of supply of natural resources are managed in such a way that they minimise environmental impact, support sustainable economic development, and benefit the local population. This is the area in which most current discussions focus, and it is important to ensure that countries avoid a “race to the bottom” in which investors and recipient countries are lowering environmental and social standards.

The second challenge, and the primary focus of this report, is the development of a global economy that does not equate increased living standards and quality of life with large-scale consumption of natural resources. This is an area that is often ignored, as most actors focus on immediate threats and incremental improvements that foreign investments can bring. As emerging economies start to increase their welfare, this issue is no longer an academic one, but instead becomes a key one in terms of national security.

From a global perspective, it is obvious that the question of absolute levels of natural resource consumption, and the distribution of these resources between developed, developing and least-developed countries, is a vital one in terms ensuring sustainable development and avoiding conflicts over natural resources. If urgent attention is not given

to the development of socio-economic models that can provide welfare with drastically reduced natural resource consumption, China can be expected to dramatically increase its outward investments, in order to secure access to the natural resources it requires to meet the demands of its rapidly emerging population. If, on the other hand, investment in the developed world is channelled into the search for sustainable solutions, China and other emerging economies will be in a position to direct a higher percentage of their outward investments into high-technology and service sectors, in order to provide the world with the innovative products and services that will be demanded for these solutions, thereby increase their own welfare as well as that of their trading partners, with far lower levels of consumption of natural resources.

It is therefore important that all major investments that have a significant impact on consumption patterns, are analysed from a natural resource consumption perspective. Investments that allow people to increase their welfare, while at the same time reducing the utilisation of natural resources, should be promoted. This implies less focus on end-of-pipe technologies that attempt to mitigate the negative effects of traditional industrialisation, and a heightened emphasis on new systems and solutions that provide services and increase welfare while minimising or even eliminating negative environmental effects. As an example, strategic investment in sustainable urban solutions, e.g. energy efficient houses, e-governance and telecommunications that allow for flexible working environments and telecommuting, will result in a decline in the demand for basic commodities such as oil, minerals and timber/paper.²⁷ Such investments would allow people to travel less, enable houses to use less energy, companies to reduce office space, and society to use less paper.

The requirement for a resource-efficient global economy has been discussed intensively in academic circles at least since the United Nations Conference on the Human Environment was held from 5-16 June 1972 in Stockholm. Global agreements reached at major conferences, such as the World Summit on Sustainable Development held in Johannesburg in 2002, have also repeatedly stated that the key responsibility for reining in the global quest for natural resources lies in the hands of those countries with the highest resource use per capita, those with most resources to invest and those who promote resource-intensive lifestyles. The companies from these countries are also often those which, through foreign investments, are moving much of their polluting and labour-intensive production and manufacturing activities to countries such as China.

A point has been reached in history when we must shape our actions throughout the world with a more prudent care for their environmental consequences. Through ignorance or indifference we can do massive and irreversible harm to the earthly environment on which our life and well-being depend. Conversely, through fuller knowledge and wiser action, we can achieve for ourselves and our posterity a better life in an environment more in keeping with human needs and hopes.

*United Nations Conference on the Human Environment, Paragraph 6
Stockholm, 5-16 June 1972*

Humanity stands at a defining moment in history. We are confronted with a perpetuation of disparities between and within nations, a worsening of poverty, hunger, ill health and illiteracy, and the continuing deterioration of the ecosystems on which we depend for our

well-being.

United Nations Conference on Environment and Development

Agenda 21, Chapter 1

Rio de Janeiro, 3-14 June 1992

We acknowledge that a number of positive results have been achieved, but we are *deeply concerned that the overall trends with respect to sustainable development are worse today than they were in 1992*. We emphasize that the implementation of Agenda 21 in a comprehensive manner remains vitally important and is more urgent now than ever.

The Commission on Sustainable Development (Rio +5)

Statement of Commitment, New York, June 1997

The deep fault line that divides human society between the rich and the poor and *the ever-increasing gap between the developed and developing worlds* pose a major threat to global prosperity, security and stability. *The global environment continues to suffer*. Loss of biodiversity continues, fish stocks continue to be depleted, desertification claims more and more fertile land, the adverse effects of climate change are already evident, natural disasters are more frequent and more devastating and developing countries more vulnerable, and air, water and marine pollution continue to rob millions of a decent life.

World Summit on Sustainable Development

The Johannesburg Declaration on Sustainable Development

Johannesburg, September 2002

Even if the principal responsibility to change production and consumption patterns lies with the developed world, emerging economies such as China also bear a significant responsibility vis-à-vis the nature and volume of their outward investments. The economic policy choices made by China directly affect the nature of the country's outward investments. Many of the companies embarking on a quest for natural resources are state-owned or controlled, although the share of such companies in the total outward investment from China seems to be shrinking.²⁸ The Chinese government might ensure that these companies are regulated, provided with guidelines and operate according to standards that contribute to, rather than undermine, sustainable development both in China and abroad.

1.1 Structure of the report

This document is an abridged version of the full report, and complete versions of the various chapters are available at www.panda.org/investment. The full version of the report provides additional background information, discussion regarding various types of outward investments, further examples, and additional sources.

The report explores China's outward investments and the relationship between these investments and the country's demand for natural resources in terms of four steps. Firstly, an overarching description is provided of the current situation in China with regard to outward investments. The report then turns to the relationship between China's outward

investments and the requirement for natural resources, following which the projected demand for different commodities is discussed. Finally, possible ways to support sustainable outward investments are presented.

This report is the result of a research project that was initiated in 2004.²⁹ It is based on research, literature reviews and interviews with different actors in China between 2004 and 2007. Experts in the field of outward investment from various spheres, including the Chinese government, private sector and academia, have been interviewed.

The report does not seek to provide a comprehensive overview of all the different kinds of outward investment coming from China, but instead focuses upon the existing and projected investments in the area of natural resources.

The report was written by Dennis Pamlin and Long Baijin. Liu Dengwei, Ph.D student in the area of Resource Exploitation and Sustainable Economic Development, Institute of Geographical Sciences and Natural Resource Research, Chinese Academy of Science, provided key research regarding different investment flows.

Valuable suggestions, comments and inputs were provided by Professor Zhang Xiaooji, Director-General, Foreign Economic Relations Department, Development Research Centre of the State Council; Houyuan Xing, Director and Senior Researcher, Research Centre of Outward Investment from China, Chinese Academy of International Trade and Economic Cooperation, Ministry of Commerce; Professor Song Hong, Department of International Trade, Institute of World Economics and Politics, Chinese Academy of Social Sciences; Professor Minquan Liu, Department of Environmental, Resource and Development Economics, Peking University, Centre for Human and Economic Development Studies, Peking University; and Dr. Hu Tao, Chief Economist, Policy Research Centre for Environment and Economy (PRCEE).

Two individuals who have long been working with the financial sector and its environmental impact also provided input and inspiration; Peter Bosshard, Policy Director, International Rivers Network, and Michelle Chan-Fishel, Green Investments Program Manager, Friends of the Earth USA.

Valuable contributions from within WWF were provided by John Kornerup Bang, WWF-Denmark (who wrote text related to Africa); Tom Crompton, WWF-UK; Dermot O’Gorman, Huidong Wang and Peng Lei, WWF-China; Nikita Kozhemyaka, WWF-Russia; Rajesh Sehgal, WWF-India; Krishna Brunoni de Souza, WWF-Brazil; Petrus Du Plooy and Alistair Schorn, WWF-South Africa; and Gary Kendall and Eivind Hoff, WWF-European Policy Office.

2.

CHINAS

OUTWARD

INVESTMENTS

2.1 An overview

China is one of the most rapidly changing countries in today's global economy. Moderate estimates suggest that it could be the world's largest economy within 40 years.³⁰ The country is presently in the process of radically reforming its economy. The development of the Chinese economy over the next two decades will be crucial for not only China, but also for the rest of the world.

Even the briefest overview of the economic indicators in China provides an insight into the staggering scale of the economy, and the growth of Chinese outward investment is impressive even by these standards. From 2000 to 2005, China's FDI grew on average by 65.6 percent per year.³¹ During the first half of 2005 Chinese outward investments almost trebled. During this period, Chinese enterprises invested US\$ 4.1 billion overseas, a 248 percent increase over previous year.³² In 2005, the outward direct investments of Chinese non-financial enterprises amounted to US\$ 12.3 billion, a 20 percent increase over the previous year. In the first three quarters of 2006, China's total outward direct investment reached US\$ 14.1 billion, an increase of 80 percent year on year. The estimated figure for the 2006 calendar year is US\$ 16 billion.³³

China is the world's second biggest economy, but when it comes to business investment in other countries it is still a very small player. The stock of China's direct investment abroad in 2005 was only one 50th that of the US.

In coming years these relative positions will dramatically change. Though official policy favours outward investment, China's companies are constrained by restricted access to foreign exchange. As the financial system is gradually deregulated, China will become the headquarters of Chinese versions of General Electric, Exxon, Philips, Toyota and Samsung. Already Chinese companies such as Lenovo, Haier and CNOOC are beginning to compete with leading multinationals. It will not be many decades before Chinese businesses own more assets abroad than those of any other nation.

John Edwards, Financial Times, 17 January 2007

<http://www.ft.com/cms/s/8cd407de-a5d1-11db-a4e0-0000779e2340.html>

Few actors see any signs of this trend declining in the near future. Official estimates from the UNIDO Director-General show that China's overseas investments are likely to reach US\$ 60 billion by 2010.³⁴

Certain sectors have of course proved more attractive than others, and between 2001 and 2005 Chinese firms launched 28 overseas mergers and acquisitions in the mining and energy industries with an average deal value of US\$ 280 million.³⁵

Figure 1 China's outward FDI since 1982³⁶
Unit: US\$ billion

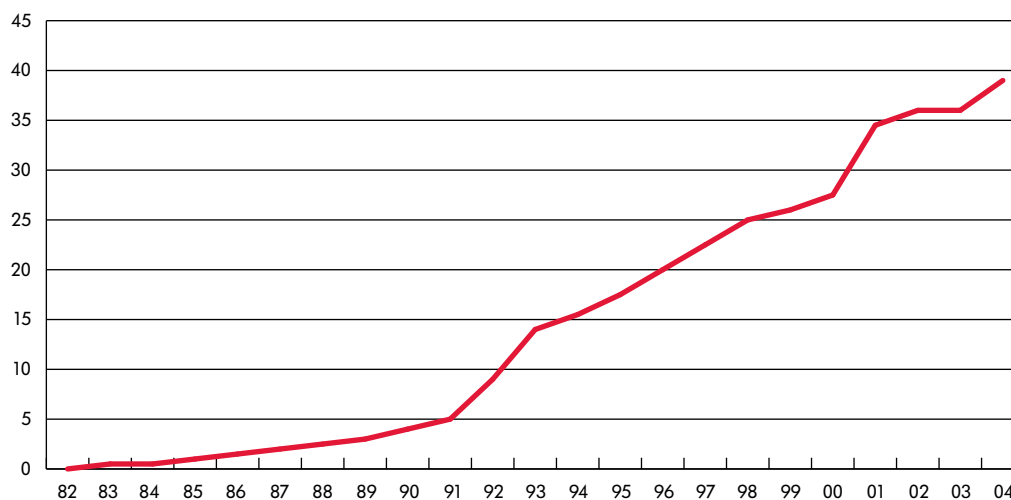


Figure 1 indicates the fact that, until the 1980s, China's outward FDI was negligible. This period was however not devoid of activity in this sphere, and can be viewed as a preparatory phase for both government and business, in which rules and strategies for foreign engagement were developed. The 1990s can therefore be seen as the starting phase of a more proactive phase of this engagement

WHO IS INVESTING?

The dramatic increase in China's outward investment can be in part ascribed to the rise of domestic transnational corporations (TNCs). According to UNCTAD, in 2000, three Chinese companies entered the list of the top 50 TNCs from developing countries.³⁷ In 2005, three Chinese companies were included in the top 50 of Forbes *Fortune 500*; the oil firm Sinopec, the power company State Grid and China National Petroleum. Apart from these companies in the top 50, a further 13 Chinese companies were included in the list.³⁸ In 2006, this number grew to 20 companies.³⁹

Outward investments depend heavily on both the structure and strategy of an economy. The following are some of the key drivers for outward investments by Chinese companies:⁴⁰

- a desire to secure access to natural resources
- a desire to support exports, expand their market presence and acquire foreign skills
- a desire to establish local distribution networks, especially in industries with excess production capacity (such as machinery and electronic appliances)
- growing exposure to international business and an increase in financial strength
- intensified domestic competition and the need to relocate mature industries to lower wage sites (for example, bicycle production in Ghana and video players in South-East Asia)
- a desire to build international brands and access advanced technologies (including through M&As and alliances), as well as to establish R&D centres in developed countries such as Germany, Japan, Sweden, and the United States

It is important to note that the drive to secure sources of supply of natural resources is only one of many reasons for the increase in outward investment. From a natural resource consumption perspective, outward investments can help reduce the use of natural resources. For example, investments that result in new distribution channels for highly efficient household appliances, or investments in R&D centres that focus on resource efficient solutions could be major contributions towards the reduction of resource consumption.

It is also important to note that China's economic development path differs markedly from many earlier economic success stories in the region. Foreign companies, for example, play a far greater role in the Chinese economy, particularly in processing industries, in which value is added in China to raw materials or semi-manufactured goods imported from other countries.

In China during 1985-2003, 61.64 percent of the total increase of china's export and import, 62.41 percent of export increase, and 60.90 percent of import increase are from foreign funded firms, not the indigenous firms. During 1981-2003, 57.83 percent of China's total trade increase came from processing trade.⁴¹

China's role as the world's manufacturing 'factory' is now at a crossroad. China, and the rest of the world, can choose a development path that is less resource-intensive, or can continue to tread the current path, which is certain to lead to increasing global competition for natural resources. A growing number of economists are currently attempting to devise new development models that will promote economic growth and poverty alleviation, without resulting in widespread environmental degradation.⁴² Such new development paths are often driven by economic and security considerations, rather than environmental ones, but the underlying driver is the same in either case; namely the fact that the planet does not have possess sufficient resources for the entire human population to sustain lifestyles and consumption patterns similar to those prevalent in developed nations.

The world does not have the resources for another 5 billion people or so to behave the way that Americans do today. It may not be about to run out of energy and commodities, but higher prices will certainly force big changes in lifestyles. The era of cheap raw materials is over. *A survey of the world economy, The Economist, 16 September 2006, p. 22*

Some emerging powers in modern history have plundered other countries' resources through invasion, colonization, expansion, or even large-scale wars of aggression. China's emergence thus far has been driven by capital, technology, and resources acquired through peaceful means... [China wants to] transcend the old model of industrialization and advance to a new one. The old industrialization was characterized by rivalry for resources in bloody wars and by high investment, high consumption of energy and high pollution. Where China to follow this path, it would harm both others and itself. *'Peaceful Rising to Great Power Status', Zheng Bijian Foreign Affairs, September/October 2005*

2.2 Policies guiding China's outward investments since 2003

Since 2003 the Chinese government has engaged in various initiatives to promote outward investments, as part of its overall 'going global' strategy, which also addresses the areas of exports and subcontracting of overseas engineering projects. These initiatives include the promulgation of a guideline on outward FDI by countries and sectors, information and databases regarding foreign countries' investment environments and opportunities, the delegation of authority by the central government to certain local provinces and municipalities, further relaxation of foreign exchange control for outward investment, and financial subsidies to those companies investing in overseas natural resources acquisition.⁴³

The State Asset Supervision and Administration Commission (SASAC) was established in April 2003 with the mandate of turning the country's top state-owned enterprises (SOEs) under its control into 50 global multinational corporations that feature on the global Fortune 500 list.⁴⁴

It is not only the biggest SOEs that are being encouraged to go abroad. Every company that wants to invest overseas must get regulatory approval, but in 2003 the Ministry of Commerce (MOFCOM) and the State Administration of Foreign Exchange (SAFE) introduced a program that allowed overseas investments of less than US\$3 million to be approved at the local government level rather than through the lengthy and complicated process of applying to Beijing. As a result, in the first 11 months of 2003, Chinese companies invested 92% more in offshore acquisitions and mergers than in the same period in 2002, according to MOFCOM statistics. Because this figure only included deals registered through the ministry, MOFCOM said that the actual rise in investments was estimated to be much higher.⁴⁵

These changes are likely to further encourage China's outward investment. If the country's outward FDI in natural resources was in the past primarily driven by the private sector, it is now definitely part of the national strategy, particularly in the area of oil and natural gas, which was included in the 10th Five-Year Plan for National Economic and Social Development. According to that plan, China will 'proactively make use of overseas natural resources, establish overseas supply bases for both oil and gas, diversify oil imports, build up a strategic petroleum reserve and maintain national energy security'.⁴⁶ The government's strategy of overseas natural resource acquisition was further demonstrated through the introduction in 2004 of a policy to subsidise investment by Chinese companies in overseas natural resources.⁴⁷

Furthermore, the Chinese authorities are taking steps to allow overseas portfolio investment by Chinese companies. For example, in February 2004, the State Council gave approval to the National Social Security Fund to invest their foreign currency funds in overseas markets.

In August 2004, the Temporary Measures on Overseas Use of Foreign Exchange Insurance Funds were promulgated, allowing qualified Mainland insurance companies to invest up to 80% of their remaining balance of foreign exchange insurance funds at the end of the previous year. Members may be aware of recent announcement that a Mainland insurance company was given the approval for overseas portfolio investment with a limit of US\$1.75 billion.⁴⁸

The central government has also provided 22 cities and provinces with a mandate to approve overseas investments of up to US\$ 200 million without requiring approval from Beijing. In December 2004, the China Development Bank issued a US\$ 10 billion loan to telecommunication equipment manufacturer Huawei to promote its international operations, a line of credit more than five times greater than the total overseas investments by all Chinese companies in 2004.⁴⁹

International organisations are also active in China's 'going global' strategy. In 2005 the Multilateral Investment Guarantee Agency (MIGA) co-sponsored a workshop with the Chinese Ministry of Finance, China Exim Bank and the International Finance Corporation (IFC). In addition, this workshop involved the collaboration of the National Development and Reform Commission (NDRC), Sinosure, the State Asset Supervision and Administration Commission (SASAC) the Ministry of Commerce, and Chubb Insurance. The workshop brought together 200 participants, of which two-thirds were from Chinese companies, and the remainder from relevant central and provincial governments, as well as from international organisations, to discuss Chinese outward investments.⁵⁰

Similarly, on 6 December 2005, the banking department of China Exim Bank and Beijing Municipal Bureau of Commerce co-hosted a Briefing on "Financing Products and Policy for Beijing Companies' 'Going Global' Practices". Mr. Li Ruogu, Chairman and President of the Bank, and Mr. Lu Hao, Vice Mayor of Beijing Municipal Government were present at this Briefing, during which China Exim Bank signed Master Agreements totalling RMB 10.3 billion with the Beijing Construction Engineering Group Corporation (BCEGC), Founder Group and CGC Overseas Construction Co. Ltd (CGCOC), to support these companies' 'going global' strategies.⁵¹

China's export credit and guarantee agencies, in particular China Exim Bank and Sinosure, have played an important role in fostering the rapid expansion of Chinese trade and

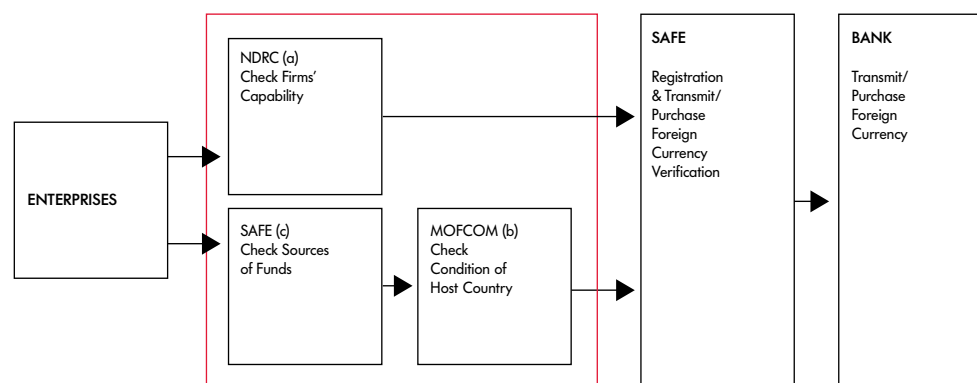
overseas investment. In 2005, China Exim Bank approved loans to the value of RMB 158.6 billion (approximately US\$ 20 billion).⁵² Established only in 1994, the institution has grown to become the world's second or third largest export credit agency.⁵³ Its portfolio includes large investment projects such as the rehabilitation of the Benguela railway in Angola, copper mines in Congo and Zambia, a hotel complex in Sierra Leone, and hydropower dams in Burma, Congo, Ethiopia, Laos, Sudan, and Zambia.⁵⁴

Li Ruogu, the Chairman and President of China Exim Bank, took up the theme of harmonious development in the organisation's Annual Report for 2005. In his introductory message, the Chairman committed China Exim Bank to contributing 'to the strong support for sustainable economic and social development and the harmonious coexistence of humans and nature'. He concluded by stating, 'we will spare no efforts (...) to contribute to establishing a harmonious society in our own country and a harmonious world at large'.⁵⁵

CHINA'S OUTWARD INVESTMENT PROCEDURES

The illustration below (Figure 2) is copied from a presentation by Joseph Battat, Foreign Investment Advisory Services, IFC.

Figure 2 China's outward investment procedures



3. CHINAS OUTWARD INVESTMENTS TO SECURE NATURAL RESOURCES

While China is a large country, its per capita resources are relatively small. When Chinese Government formulated the country's sustainability strategy (Agenda 21) in 1989, they estimated that the per capita fresh water, cultivated land, forest and grassland of China comprised 28.1 percent, 32.3 percent, 14.3 percent and 32.3 percent of the world's average respectively. Furthermore, they surmised that these per capita resource figures, as well as the ecological quality of the resources, were declining⁵⁶ In most Chinese studies regarding the use of natural resources, this fact is particularly prominent.⁵⁷

3.1 China's domestic natural resource constraints

The fact that the country possesses so few natural resources, has placed China in a position where the natural resources of other countries have become crucial to its continued economic development.

China's demand for steel accounts for one fourth of the world's total demand. China is the third largest consumer of precious metals, only second to India and the U.S. In 2004, China imported about 8.5 million tons of grain from the U.S., Canada, Australia and France. Thus, China is becoming the number one buyer in the world.

Low level of per capita resources is the primary cause. China's level of per capita natural resources is far below the world average. The per capita area of arable land in this country is only one fifth of the world average, the level of per capita water resources is one fourth of the world average, and that of forest is one seventh of the world average. The per capital reserves of key mineral resources that support the growth of the national economy like petroleum, natural gas and coal in China are only 11 percent, 45 percent and 79 percent of the world average.

*China Economic Net*⁵⁸

[A] force driving outward FDI by large countries such as China and India has been the desire to secure long-term supplies of natural resources (particularly oil and natural gas, iron ore and other minerals) to meet domestic industrial demand. An Indian state-owned company, Oil and Natural Gas Commission, invested in an oil field in Sudan and in the Sakhalin oil and gas field in the Russian Federation. Similarly, the Chinese companies Sinopec, Petrochina and China National Offshore Oil Corporation have invested in oil, gas and mining activities in 14 countries, including Indonesia, Kazakhstan, Myanmar, Sudan and Yemen.

*Carlos Fortin, Officer-in-Charge of UNCTAD (2004-2005)*⁵⁹

Securing supplies of natural resources has therefore become a key factor of China's outward investment strategy. As a result, it is not surprising to see Chinese investments occurring in almost all the resource-rich regions of the world; Russia and central Asia, Sudan and the Middle East, Malaysia and Venezuela for oil and gas; Canada, Australia, Brazil, Peru, Zambia and South Africa for minerals; and Russia, Malaysia, Indonesia, New Zealand and Thailand for forestry products. These countries are among the top recipients of China's outward FDI. This trend was noted by UNCTAD in the *World Investment Report* 2006, which stated that 'A key driver of Chinese outward FDI is the country's growing demand for natural resources, as suggested by its investment projects in this sector in Latin America and Africa'.⁶⁰

3.2 Natural resource demand as a driver of outward investment

China and other emerging economies have only just begun to make an impact on commodity markets. Given the size of their populations, their use of natural materials is still modest.

*The Economist*⁶¹

Acquisition of resources, and of natural resources in particular, has been one of the key strategic considerations for China's outward FDI strategy since its inception. Prior to 1991, Chinese overseas investment was highly concentrated in North America and Oceania, with Canada and Australia being the largest recipient countries, attracting US\$ 360 and 313 million respectively. China's investments in these two countries include China Metallurgical Industrial Corporation's (CMIC) investment in the Channar Mine in Australia, China

International Trust and Investment Corporation's (CITIC) and China National Non-ferrous Metal Industrial Corporation's investment in the Portland Aluminium Smelter in Australia, China International Trust and Investment Corporation's (CITIC) investment in a sawmill in Alberta, Canada and the China National Petroleum Corporation's (CNPC) equity in an oil extraction project in Canada.⁶²

During the 1990s, this natural resource-seeking outward FDI continued to increase, with a growing emphasis on fuel and other raw materials. This trend was a consequence of China's high economic growth, which led to a significant increase in demand for fuel and industrial raw materials. For example, Peru became the largest recipient of China's outward FDI between 1992 and 1996, receiving a total US\$ 120 million, primarily due to Capital Iron & Steel's (Shougang Corporation) acquisition of Hierro Peru Mining Ltd in November 1992.⁶³ In Indonesia, China National Offshore Oil Corporation (CNOOC) became the largest foreign oil producer after its US\$ 585 million takeover of Repsol Indonesia in 2002. Baosteel, China's biggest steel maker, has been negotiating the largest overseas manufacturing investment in history by a Chinese company, to take a controlling stake worth US\$ 1.5 billion in a US\$ 8 billion steel plant in Brazil.⁶⁴ Over the past several years, such investments in Latin America and Africa have become front-page news around the world.

3.3 Reactions in other countries

China's dramatic increase in demand for natural resources has caught many countries by surprise. In many cases these countries are unsure of whether China should be viewed as a client or a competitor, an opportunity or a threat. Indeed, this ambivalent attitude does not apply to China only in terms of its quest for natural resources, but also in terms of its increasing economic strength in general, which challenges the existing economic powerhouses.⁶⁵

A booming China, and its resulting increased requirement for natural resources, technology, equipment and products from overseas, have provided growth opportunities both for companies and countries from across the globe.

For the first time, a developing country, China, has made the list of the expected top five home countries worldwide in terms of geographical coverage (2004-2005), replacing Japan, which traditionally has been a significant home country. Many developing countries rank China second after the United States as an expected country of origin for FDI... The phenomenon is particularly significant because it underscores China's growing importance as regards FDI, not only as a host but also as a home country.⁶⁶

China's investment in overseas natural resources has encountered mixed reactions around the world. It has been warmly welcomed by many resources-rich countries; for example, in December 2004, Venezuela's President Chavez met with his Chinese counterpart, Hu Jintao, in Beijing to discuss a new bilateral agreement regarding China's access to Venezuela's energy market, including the development of 15 oil fields that are currently not in production.⁶⁷

The New York Times reported on 23 December 2004 that, according to Murray Smith, a

former energy minister in Alberta, Canada, ‘The China outlet would change our dynamic. Our main link would still be with the U.S., but this would give us multiple markets and competition for a prized resource.’⁶⁸ In January 2005, the governments of China and Canada issued a joint statement on the subject of bilateral energy cooperation in the 21st century.⁶⁹

The dramatic increase in China’s demand for natural resources and its resulting overseas acquisitions, have led some countries and international organisations to express concern. Russia is still indecisive about whether its oil export pipeline should lead to China or Japan. The Russian government does not appear to welcome Chinese oil companies in purchasing its oil assets when these are offered for international tender.⁷⁰ While Canada is interested in China’s huge market for natural resources, it is also cautious of China’s acquisition of its natural assets, as demonstrated in the resistance to China’s Minmetals’ attempted acquisition of Noranda, valued at US\$ 5 billion.⁷¹

In order to achieve its goal of transforming China into a comprehensive world power, Beijing must have secure access to raw materials in markets that have become increasingly competitive and tight, due in great part to China’s growth. The bid for Unocal signals that Beijing is aware that it must act quickly to guarantee its resource supplies, at the expense of competitors, especially the U.S. As part of Beijing’s overall strategy, Chinese enterprises have recently purchased mines in Australia and Canada, and Beijing has pursued trade deals geared to natural resources in South America. Unocal is part of that larger picture. *Intelligence Brief: China, 28 June 2005*⁷²

India, in its quest for oil to fuel its growing economy, regards China as a strong competitor.⁷³ In its quest to discover fossil fuel supplies off its own coastline, China is also caught up in competition with Japan, the third largest oil consumer after the US and China. Apart from the above-mentioned Russian oil pipeline for which both China and Japan are competing, China’s recent attempt to explore the Chunxiao gas field located close to Japanese coastal territory, has strained the already tense relations between the two countries. As a comment indicates, ‘The tensions between China and Japan over the gas reserves in the disputed waters in the East China Sea continue to simmer. At stake is a number of promising gas fields, but the broader geopolitical issues relating to import dependence and energy security are also part of the agenda of both sides’.⁷⁴

China has also been politically criticised for its prioritisation of oil interests over human rights issues, for example in Sudan,⁷⁵ and for fuelling ‘illegal logging, unsustainable trade and poverty’ through timber import from controversial regions such as Burma/Myanmar.⁷⁶

“South-South” foreign direct investment—investment from one developing nation into another—is growing at a rate five times faster than the growth of traditional North-South investment from industrialized to developing countries; today “South-South” flows represent almost a third of all foreign direct investment.

Joseph Battat and Dilek Aykut of the World Bank found in a recent study that South-South FDI had increased from \$15 billion in 1995 to \$46 billion in 2003, accounting for about 35 percent of total FDI flows in developing countries. At the same time, high-income OECD countries also received \$16 billion in FDI from developing countries in 2001, up from \$1 billion in 1995. Recent figures suggest that Southern multinationals continue to expand globally.⁷⁷

4.

PROJECTED
NEEDS IN
DIFFERENT
KEY SECTORS

Chinese outward investments in different sectors are at different stages of development. Some areas, such as oil and gas, have been in the forefront due to a combination of urgent need to meet increased demand and the existence of large domestic companies that are reasonably experienced in doing business abroad. A number of other sectors have also experienced increased activity in this regard, albeit on a somewhat lower level. Future projections of Chinese outward investment provide an indication of the areas in which resource challenges will emerge in the future.

Apart from fossil fuels, a major commodity of interest for Chinese outward investment is mineral resources. This is an area in which both Latin America and Africa have already experienced increased interest from Chinese companies and politicians.

Forestry and timber products is another area in which Chinese outward investments is on the rise. This increase was accelerated by the domestic logging ban implemented in China in 1998, and only a few years after this ban, discussions regarding Chinese demand for foreign timber continue to make international headlines.⁷⁸

Finally, and of critical importance, is the area of agricultural production, food and water. To date, this has not been a major area of focus for Chinese outward investment, even if a few such investments have made headlines. In terms of expected increases in domestic Chinese demand for food products, however, it can be expected that this sector will assume far greater importance in the future.

4.1 Oil

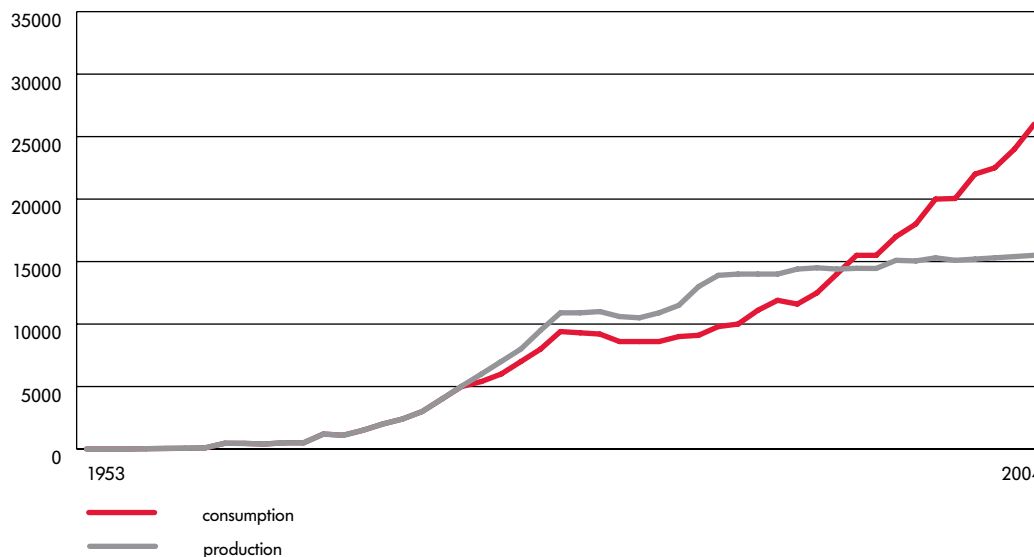
The resource that has resulted in the most intensive discussions regarding China's increased demand and foreign acquisitions is, without a doubt, oil.

Already, China has overtaken Japan as the world's second biggest importer of oil, after the United States. And its appetite is huge and growing. As Daniel Yergin of Cambridge Energy Research Associates puts it, "China has gone from being a minor player in world commodity markets, if a player at all, to being the decisive dynamic factor today. In terms of oil, 40 percent of the entire growth in oil demand since the year 2000 has been China."⁷⁹

In 2006 China was the world's second largest oil consumer after the USA, and the third largest oil importer, after the US and Japan. Also in 2006, China imported 145 million tons of crude oil, up 14.5 percent from 2005.⁸⁰ As a result of rapid economic growth, China's oil demand is expected to grow at a yearly rate of 4.3 percent up to 2020.⁸¹

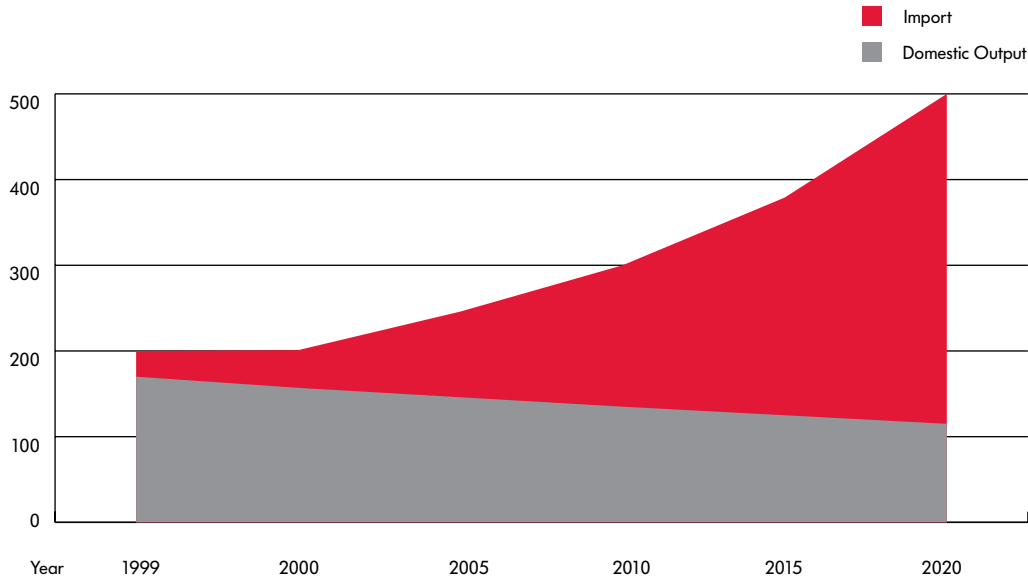
China became a net oil importer in 1993 and since then its oil imports have been growing rapidly.⁸² Crude oil imports account for 40 percent of the country's total oil supply.⁸³ This shortage in domestic supply is expected to intensify in the years to come, as per the projection of the Asia Pacific Energy Research Centre (APERC):

Figure 3. China's oil production and consumption, 1953-2003⁸⁴
(Unit: 10,000 tonnes)



Source: APERC, 2002, pp. 57-59.

Figure 4. China's Oil Demand: Output and Import, 1999-2020
(Unit '000 tonnes)



Source: APERC, 2002, pp. 57-59.

Shortly after China became a net importer of oil in 1993, CNPC made oil acquisitions in Sudan, Kazakhstan, Venezuela, and Peru.⁸⁵

China's quest for energy resources on the world stage is creating a destabilizing effect on international and regional security. Fuelled by the lack of a coherent multilateral approach to energy security in Asia and by China's already tense relations with neighbouring states, the competition for energy resources may prove to be the spark for regional and international conflict. In many cases, China is vying for energy resources in some of the most unstable parts of the world. Its involvement in regions with raging conflicts could potentially draw it into the disputes, escalating a regional conflict into an international conflict.⁸⁶

According to the research conducted by APERC, China's oil import dependency will rise from the current level of 40 percent to approximately 70 percent by 2020. It is therefore no surprise that the Chinese government regards oil as one of the most important natural resources, second only to water.⁸⁷

China's expectation of a growing future dependence on oil imports has led it to acquire interests in exploration and production in areas such as Kazakhstan, Russia, Venezuela, Sudan, West Africa, Iran, Saudi Arabia, and Canada. Despite its efforts to diversify its resources, however, China has become increasingly dependent on oil supplies from the Middle East. In 2006, 58 percent of China's oil imports came from that region. By 2015, the share of Middle East oil in Chinese imports is projected to reach 70 percent.⁸⁸ Although China has in the past not forged particularly strong links or held long-standing strategic interests in the Middle East, its relationship with the region that supplies the bulk of its oil is

becoming increasingly important.⁸⁹

The attempt in 2005 by China National Offshore Oil Corp (CNOOC) to purchase Unocal proved just how controversial issues regarding control and ownership of oil reserves can be. Although the matter made news throughout the business media, its significance was not accurately reflected even in more serious media outlets in the west.⁹⁰ Media reports in China indicated a level of surprise amongst Chinese policy makers, who did not expect the US government to turn the situation into a political issue.

Despite making an offer of US\$18.5 billion over Chevron's US\$17.4 billion, the Chinese company decided to pull back due to unacceptable risk resulting from the unfavorable political environment in the United States.⁹¹

The issue of oil demand has also triggered high-level discussions between China and India.

Beijing relies on foreign producers for one-third of its oil supplies and accounts for about seven percent of world oil demand. China used 5.46 million barrels of oil a day in 2003. India imports nearly 70 percent of its oil needs and last year consumed a little over two million barrels a day. A government paper has forecast that by 2025, India will consume 7.4 million barrels a day.⁹²

The two most populous countries on the planet have come to realise that they must collaborate in order to find maximum synergies in this area.⁹³ 'Both the countries have no other way but to go out and look for assets overseas to secure supplies,' said V. Raghuraman, a senior adviser to the Confederation of Indian Industry, the nation's largest industry body. 'More often than not, both of us end up competing against each other'.⁹⁴

Such collaboration has already created a significant degree of international interest, and may provide a first step towards an axis for global sustainability. Unfortunately, however, the majority of discussions regarding China's and India's energy requirements have focused upon conventional energy rather than the required transition to sustainable energy sources. In this regard, the title of the current initiative is possibly misleading; although it is called the 'Memorandum for Enhancing Cooperation in the Field of Oil and Natural Gas' it includes both traditional areas, such as upstream exploration and production, refining and marketing of petroleum products and petrochemicals, as well as sustainability concerns such as research and development, conservation, and the promotion of environment-friendly fuels. The initial focus has been primarily on the immediate challenges concerning oil, but WWF sees a great opportunity to develop this into a Sino-Indian partnership promoting for sustainable solutions. For more information please see WWF's report "Indian Companies in the 21st Century" available at www.panda.org/investment.

Depending upon the type of investments in infrastructure that take place in China over the next decade, and the type of international trade that this investment generates, China could either lock itself, and the rest of the world, into a dependence on oil that will be very difficult to change, or become a leader in the development of a resource-efficient economy. The direction in which the country moves will to a significant degree depend on whether foreign investors and importers look to China as a source of low-cost manufactured products, or whether these foreign companies support the targets that the Chinese government has

formulated regarding energy efficiency and the increased use of renewable energy.

At present, the signs are not promising. Early in 2007, the China Petroleum Pipeline Bureau (CPPLB) stated that the country intends to construct an additional 25,000 km of oil and gas pipelines by 2010, in order to support economic development. This represents a more than 50 percent increase on the current total existing length of 40,000 km.⁹⁵

Should such current development trends continue, and China follow in the footsteps of developed economies, one of the most significant implications will be a major increase in the number of traditional internal combustion vehicles, thus increasing the requirement for fuel. As early as 2004, *China Daily* wrote, 'China expects to have 140 million automobiles plying its roads by 2020, seven times more than now, fueling demand for transportation infrastructure and services, state media reports'.⁹⁶

Some analysts are looking to the anticipated fuel switch from oil to biofuel as a solution to this issue, but closer examination reveals that this would simply move China's fuel dependence from oil to agricultural products. Industrial consumption of corn in China represents 20 percent of the total current Chinese corn demand, and of that figure, ethanol production accounts for 40 percent. The expansion of ethanol production to 4 million tonnes per annum by 2020 would force China to become a major importer of corn.⁹⁷

4.2 Minerals

In early 2005, the Chinese steel manufacturers had to accept a 71.5 percent price increase from foreign iron ore suppliers such as Rio Tinto, Companhia Vale Rio Doce (CVRD) and BHP Billiton.⁹⁸

With regard to mineral resources, China is relatively well-endowed in absolute terms. Its proven mineral resources account for 12 percent of the world total, but on a per capita basis the country possesses only 58 percent of the world average, ranking 53rd amongst all countries.⁹⁹

Of the 45 major minerals to be found in China, it is likely that only 24 will be capable of meeting China's needs by 2010, and only six will be able to meet projected demand by 2020. According to Pan Wencan, Director of Planning, Department of the Ministry of Land and Resources, China is in short supply of such important minerals as high-grade iron ore, chromite, copper, and sylvite.¹⁰⁰ The consumption of these minerals is expected to increase by a factor of between two and five over the next 20 years, with a supply gap of steel projected at 3 billion tonnes, copper at 50 million tonnes, and refined alumina at 100 million tonnes.¹⁰¹

In 2004, overseas direct investment by Chinese enterprises in the mining industry was US\$ 1.9 billion, accounting for 53 percent of China's total overseas investment during that year.¹⁰² Companies dependent on mineral inputs are now looking all over the world for sources of supply.¹⁰³

Experts expect copper demand in China to grow as much as 24 percent to 4.7 million tons per annum by 2010, from 3.8 million tonnes in 2006. By 2020, this demand will probably rise to between 6.5 and 6.9 million tonnes per annum.¹⁰⁴ During 2007, China will import the bulk of the world's iron ore, with imports expected to rise by 30 million tonnes to 355 million

tonnes. China's largest steel maker, the Baosteel Group, has agreed on an iron ore price for 2007 with major iron ore producers, including the Brazilian Companhia Vale do Rio Doce (CVRD), which is 9.5 percent higher than the price in 2006.¹⁰⁵

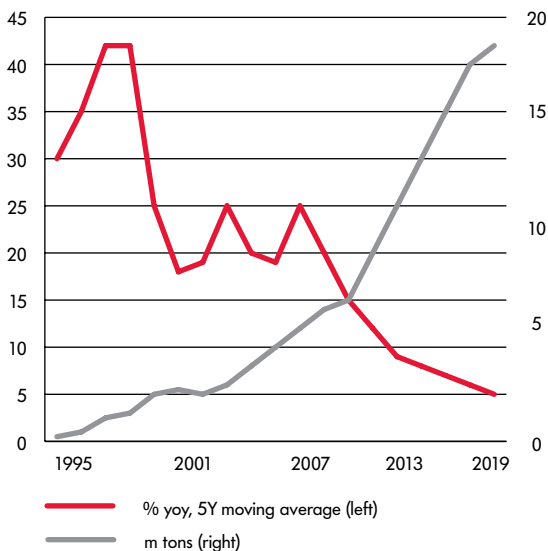
Table 2 provides an estimate of China's import dependence on key minerals.

Table 2. China's Import Dependence Projection of Major Minerals

Product	Import Dependence (%)		
	2000	2010	2020
Oil	31	41	58
Iron	33	34	52
Manganese	16	31	38
Copper	48	72	82
Lead	0	45	52
Zinc	0	53	69

Source: Eleventh Five-Year Planning Team of the State Council Development and Research Center.
Available at: <http://finance.aweb.com.cn/2005/3/22/11281211.htm>

Figure 5. Copper Imports



Source: DB Research¹⁰⁶

Matching China's demand with those countries that offer potential sources of supply is not difficult, and in this regard it is easy to understand why Latin America and certain regions in Africa are of particular interest to the Chinese government. African countries, including

Angola, Congo, Equatorial Guinea, Gabon, Nigeria, and Sudan, already provide more than a quarter of China's oil imports, while China sources copper, chromium, diamonds, platinum, and uranium from amongst others South Africa, Zimbabwe and Botswana.¹⁰⁷

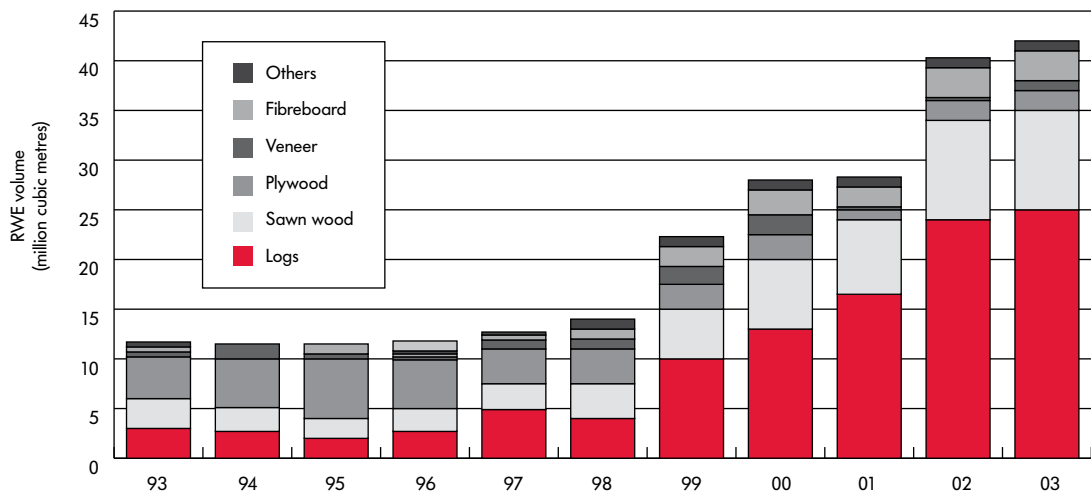
4.3 Timber

China is a major player in the global forestry products market, both as producer and consumer. China's market for industrial timber, pulp and paper is the second largest in the world, outranked only by the USA. China possesses relatively limited forest resources and a great potential for increase in the consumption of wood and paper products.¹⁰⁸

Several demand growth poles may emerge over the coming 30 years, with significant impacts on global trade. The largest potential markets are in the populous countries of Asia, particularly China and India. At present these two countries, with around 40 percent of world population, consume less than 10 percent of the world's industrial wood... in Sweden and the United States, per capita consumption of wood products is currently at least tenfold that of the developing countries.¹⁰⁹

As a result of both the growth in demand for forest products in the domestic market, and a decline in domestic supply, China's imports of forest products are rising rapidly.

Figure 6. China's Timber Imports (by product type)



Source: Zhu Chunqian et al., p. 21. Available at: <http://www.wwfchina.org/sl/download/Chinawood.pdf>

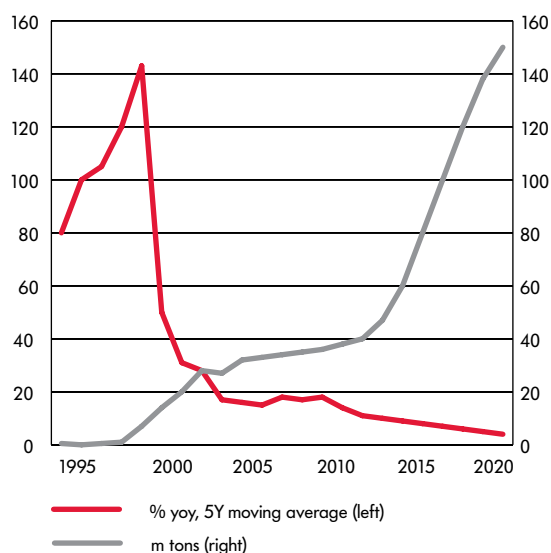
China's demand for forest products is projected to grow robustly and Table 3 gives an estimate of its situation for the year 2010.

Table 3. Estimates of China's Wood Market (2010)

Study	China's domestic industrial wood supply (cubic metres –RWE)	Import volume needed to match demand (cubic metres –RWE)
WWF report	114 million	125 million
ITTO (Shi and others 1999)	180 million	64 million (21 million in tropical timber)
Wood Resources International (Hagler and others 2001)	113 million (83 million from short rotation plantations)	119 million

Source: Zhu Chunquan et al., p. 25.

Figure 7. Wood Import



Source: DB Research¹¹⁰

4.4 Agricultural products and water

Although China is home to approximately 20 percent of the world's population, it possesses only 7 percent of the world's farmland. There is currently only 0.1 ha of farmland for every person in China, approximately 40 percent of the world average. Despite this situation, there exists some debate as to whether China will in the future become a permanent net food importer. Certain studies propose this as a strong possibility, with a knock-on effect on world market prices that would reduce the importing capacity of developing and least-developed food-deficit countries.¹¹¹ An examination of the key statistics regarding China's food and agriculture imports since 1976, however, provides a very mixed picture.¹¹²

Fig 8-10 Key statistics of food and agriculture imports in China since 1976¹¹³
Figure 8

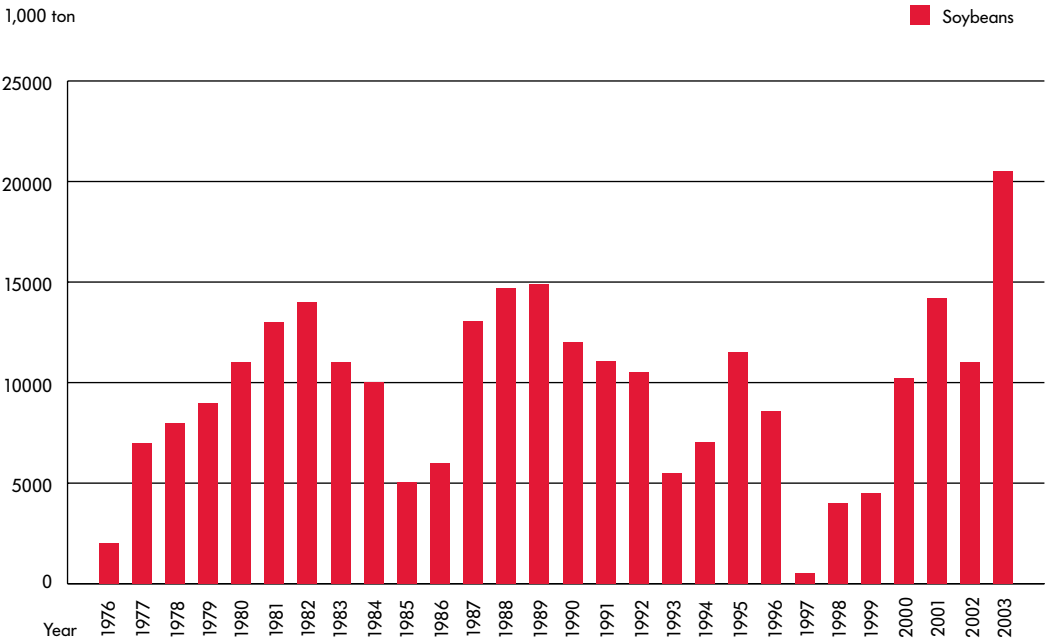


Figure 9

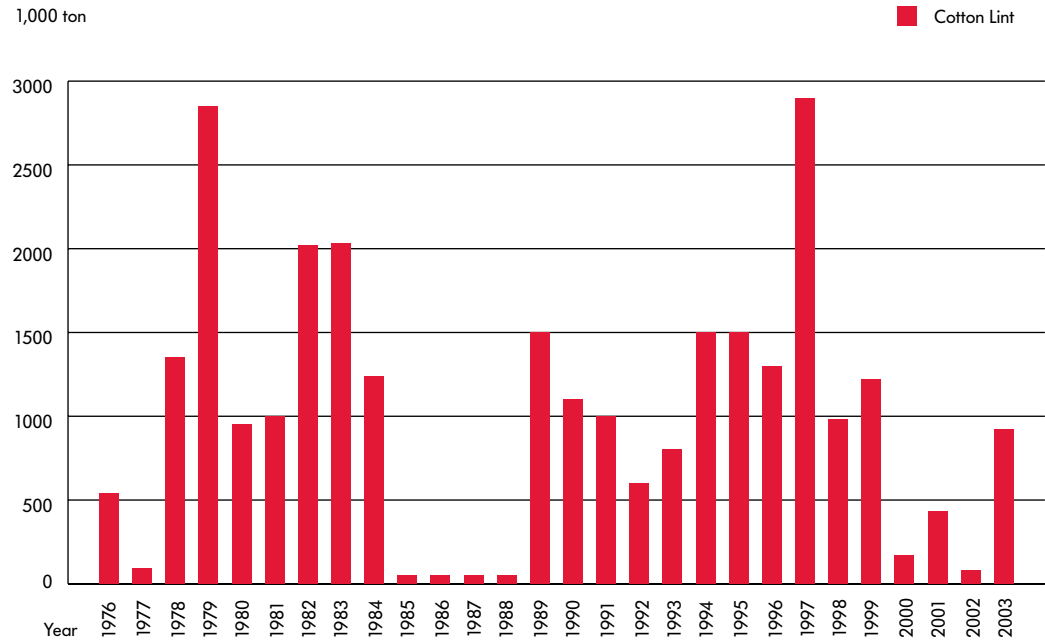


Figure 10

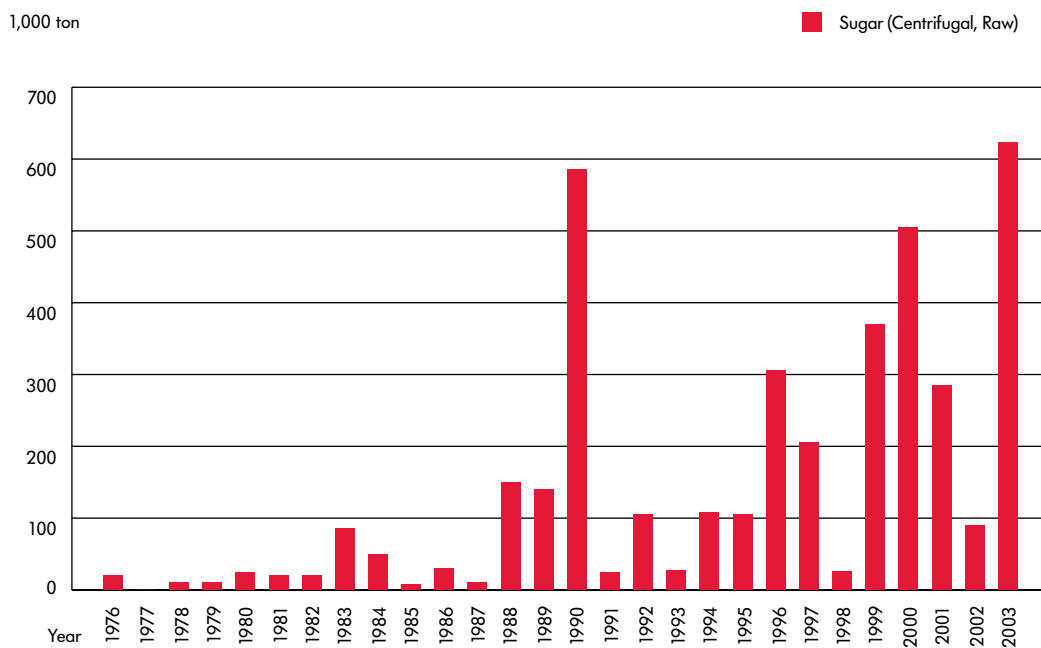


Table 4. The guide directory of China's outward investment in Agriculture industries in different countries of the world¹⁴

Countries	Investment Industries
Thailand	Yam planting
Laos	Grain planting
Burma	Grain planting
Kampuchea	Grain planting
Philippine	Paddy rice planting
Brunei	Paddy rice planting
India	Crops planting
Bengal	Jute planting
Egypt	Cotton planting
Nigeria	Fruit
Tanzania	Sisal planting
Zambia	Crops planting
Russia	Fruit
Australia	Livestock
New Zealand	Livestock
Mexico	Crops planting
Cuba	Paddy rice planting
Venezuela	Crops planting
Argentina	Grain planting

For world markets, China's net trade status is of particular importance.¹¹⁵ From Figures 8-10 above, it is apparent that China's imports of agriculture products have increased significantly over the past several years. In response to this trend, the Chinese government in 2005 produced a guide directory aimed at encouraging Chinese companies to invest in agriculture industries abroad (Table 4).

The degradation of arable land, a burgeoning population and the country's fast-growing consumption demand all pose a great threat to China's long-term agricultural productivity. Consequently, the gap between demand and self-supply is consistently widening.

Table 5. Projections of China grain gap between self-supply and demand by different experts¹¹⁶ (million tonnes)

Year	Jikun Huang ¹	Xiaoguang Kang ²	Xikang Chen ³	Fangquan Mei ⁴	Lester R Brown ⁵	World Bank
2010	40	83				
2020	47	183	35			32
2030	38	91	50	20-30	207-369	

Sources_

1. Center for Chinese Agricultural policy, Institute of Geographical Sciences and Natural Resource Research, Chinese Academy of Sciences.
2. Chinese Academy of Sciences; Tsinghua University; Ministry of Agriculture.
3. Academy of Mathematics and Systems Sciences, Chinese Academy of Sciences.
4. The Agricultural Documentation and Information Center of the Chinese Academy of Agricultural Sciences, Ministry of Agriculture.
5. Lester Brown, World Watch Institute, 1995.

Table 6. Self-sufficient ratio of main farm produce in china¹¹⁷

Year	Rice	Wheat	Corn	Poultry	Soybean	Sugar	Cotton	Milk	Beaf
2001	101	99	105	99	61	96	100	97	100
2010	102	90	80	106	64	83	94	83	98
2020	106	96	72	105	60	76	86	79	96

According to a US Grains Council delegation that visited China in March 2005, the country will rapidly become a net importer of corn over the next several years.¹¹⁸ Jikun Huang, of the Centre for Chinese Agricultural Policy, predicts that by 2010, China will be forced to import 3400 million tonnes of corn, and by 2020, up to 5600 million tonnes.¹¹⁹

It is further projected that China will experience a shortfall in the production of sugar over the next several years. By 2010, it is estimated that 17 percent of China's sugar demand will need to be met by imports, and in 2020 this figure could increase to 24 percent.¹²⁰

China is the world's top soy importer, consuming 40 million tonnes of soy every year, but producing only 16 million tonnes, a gap which must again be offset by imports. Brazil is the world's second-largest soybean producer, and exports US\$ 450 million worth of crude soy oil to China per annum, which represents 30 percent of Brazil's total exports of this product. In January 2005, China and Brazil reached an agreement on quarantine issues for soy and soy oil that would assist in preventing possible trade disruptions and promote the soy trade between the two countries.¹²¹

The soybean self-supply gap will probably also increase. Jikun Huang projects that in 2020, 40 percent of China's soybean consumption will depend on international markets.¹²²

China will also expand its cotton imports. In 2006, China imported 894,000 tonnes of cotton, according to sources from the National Development and Reform Commission and China Cotton and Textile Industry Association. It is estimated that by 2020, only 86 percent of China's cotton demand will be satisfied from domestic sources.¹²³

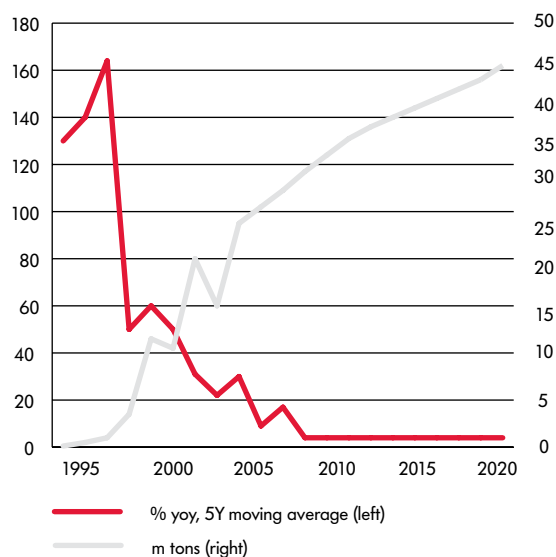
In response to these trends, China is currently investing significantly in a number of agricultural regions worldwide.

A group of Chinese investors plans to invest up to US\$8.6 billion in Indonesia's palm oil sector over the next five years. According to Indonesian officials, this comes at a time when Indonesia desperately needs to expand its stagnant agricultural industry, including the palm oil sector.¹²⁴

The Zhongken Farm, established near Lusaka with an investment of 220,000 US dollars in 1994, [has] made great profits through investing in the farming sector and processing farm produce, such as chicken, beef cattle, milk etc. The Jiangsu Provincial State Farm Corporation [has] also [succeeded] in Africa, which is ready to expand its business from Zambia to Zimbabwe, South Africa and Botswana in the coming two or three years.¹²⁵

China [Corporation] also target the soybean market in South America, esp. Brazil, Bolivia, some state farm in Hei long jiang province have shown interest in the investment.¹²⁶

Figure 11 Soy Imports



Source: DB Research¹²⁷

Given the large number of opinions and data sources available on the subject, it is of course difficult to project China's future demand for these products with any great certainty. The above are examples of some estimates. In 2006, Deutsche Bank published an overview of the future demand for various products (Table 6), that provides an indication of the scale of change which lies ahead.

Table 6. Projections for China's commodity import demand

Commodity	Unit	Annual Demand		2006–2020, % change	
		Latest	2020	Total	Avg p.a.
Iron Ore	m tonnes	148	710	380	10
Oil	m tones	91	1860	1940	20
Soy	m tonnes	26	50	80	4
Coal	m tonnes	11	810	7400	20
Copper	m tonnes	3	20	600	10
Manganese	m tonnes	3	13	360	10
Meat	m tonnes	0,3	4	1260	20
Wood	m tones	34	150	330	10

China's commodity hunger –Implications for Africa and Latin America

Deutsche Bank Research Authors: Tamara Trinh & Silja Voss

5. POSSIBLE WAYS FORWARD

可能的前进道路

This chapter, dealing with possible ways forward, comprises three segments. The first, in Section 5.1, introduces a ‘triangular approach’. Traditionally, international economic diplomacy has been focused primarily upon bilateral relations between countries, and to a lesser degree, broad multilateral agreements and institutions, and specific regional fora. However, with an increased requirement to ensure sustainable resource utilisation and equitable economic development, as well as recognition that China is in many instances the “factory of the world”, these traditional approaches do not present sufficient opportunity to address the issues at hand. A triangular approach represents an alternative means of structuring dialogue between economic actors in different parts of the global economic value chain, often located in different countries.

可能的前进道路包括3个部分：

第一部分，即第5.1章，介绍一种“三角模式”。迄今为止，国际外交都是围绕双边关系进行策划组织。除了承认中国在许多方面是这项活动的一个因素以外，随着确保可持续资源使用和公平的经济发展的必要性不断增强，这不再是一种可持续的选择方案。三角模式是组织不同经济参与者（例如，政府和公司）开展对话，以确保全球经济价值链的所有环节都参与的一种方法。在此，重点就放在提供自然资源的参与者、制造货物和服务的参与者和最终消费者之间的对话。

The three elements of this triangle are; 1 – natural resource providers; 2 – manufacturers of products and providers of services; and 3 – consumers of these products and services.

The second segment, addressed in Section 5.2, deals with the idea of a ‘circular economy’, a Chinese concept introduced in November 2002 by the 16th National Congress of the Communist Party of China, to promote sustainable development of the national economy.¹²⁸ This is a concept that WWF believes should also be implemented at a global level, hence the suggestion for introducing a ‘global circular economy’. The discussion in this regard focuses firstly on structured dialogues, and then moves on to examine actual material flows in the global economy. The objective in this regard is to investigate the possibilities that exist for replacing the traditional ‘linear’ economy with an efficient circular economy. Instead of a national perspective regarding sustainability, a global circular economy possesses, as the name suggests, an international perspective. Instead of a focus on the manufacturing or production of goods and services, such an approach addresses the way in which changing consumption patterns can promote sustainable development.

Sections 5.3 to 5.5 of the chapter examine the respective needs which exist within the three different elements of the global circular economy, namely manufacturers, consumers and resource providers. These three elements are of course closely interlinked, and many of the measures suggested therefore apply to more than one of these, and must be implemented simultaneously within each element. As the focus is on the challenge for the global economy, the production/manufacturing element is the first one that will be studied, followed by the consumption element, and finally the provision of natural resources.

The recommendations provided in this report differ somewhat from those made in other reports generated by WWF’s Trade and Investment Programme, as no specific groups of economic actors are identified for the various recommendations. The reason for this lack of differentiation is that in many instances, these recommendations require new networks to be established, with leadership in this process potentially being drawn from several sectors, including government, business, academia and NGOs.

第二部分，即第5.2章，论述“循环经济”，也就是促进中国经济可持续发展¹²⁸的中国理念。世界自然基金会认为这种理念在全球范围内也应当适用，因此，建议作为促进“全球循环经济”的一种方法。前述第一部分是关于结构对话，而第二部分则重点是全球经济中的实际物质流通。目的是打破线型经济，确保建立高效的循环经济。

接下来的3个部分，即第5.3–5.5章，更详细地考察全球经济3个不同部分：自然资源、制造/生产和消费在全球循环经济中必须联系在一起的必要性。这三个部分间相互关联紧密，许多措施不仅仅只适应于一个部分，所以，它们不能相互割裂开来。

这些建议同世界自然基金会贸易和投资规划的其它报告不同，因为它们没有为不同的建议选定出具体的团体。这样做的理由是这些建议要求建立新的网络，需要由不同的参与者来领导，如政府、学术界、公司和非政府组织。

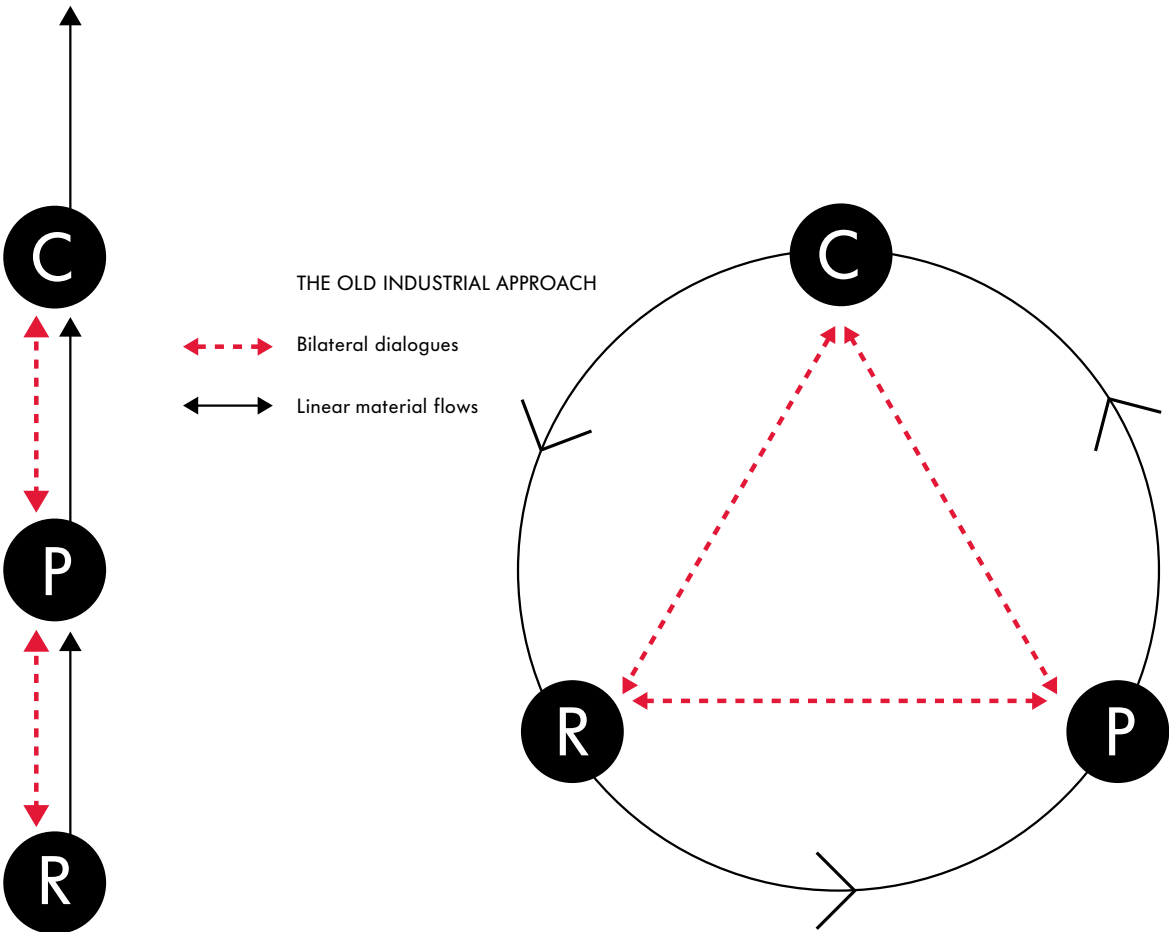
5.1 Introduce a ‘triangular approach’ in both global diplomacy as well as trade and investment policy making

将“三角模式”引入贸易及投资政策的制定以及全球外交活动中

As mentioned, this approach identifies three categories of actors within the global trading system; providers of natural resources, producers or manufacturers of products and services, and consumers.

这种途径将包括全球贸易体系中的3种参与者：提供自然资源者、生产/制造者和消费者。

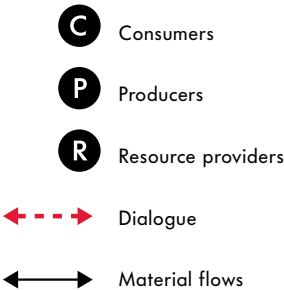
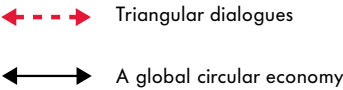
Figure 12. From the old industrial approach to a new sustainable approach



Within this global circular economy, these three categories can obviously not simply be applied to individual countries, since virtually every country will contain actors falling into each of these categories. However, an investigation into issues such as the size of trade and investment flows, the areas in which new innovative solutions are most likely to occur and the regions in which the challenges are most significant, quickly reveals the significance of certain triangles above others. For instance, as previously established, the most important providers of natural resources are currently the developing nations of Latin America, Asia and Africa, while the prime example of a producing and manufacturing economy is obviously China, although India is assuming increased prominence in this regard. In terms of consumption, it is readily apparent that the majority of this activity occurs in the EU, US and Japan.

既然几乎每个国家都有不同种类的参与者，因此，这3种参与者显然不能简单地适用于某个国家。在贸易和投资流中，不仅最有可能出现新的创新性解决方案，而且其中的挑战也最突出。然而，考察贸易和投资流的规模，我们会发现，有些三角关系可能比其它三角关系更重要。如果我们研究一下自然资源提供者，我们经常会发现它们主要是拉美、亚洲和非洲的国家，而生产/制造国的最好例子显然是中国，但印度也是。当谈到消费国家时，我们看到它们仍然主要是欧盟各国、美国和日本。

NEW SUSTAINABLE APPROACH



Triangular discussions for sustainable globalisation must therefore be established between the countries occupying the differing roles identified above, for example Africa-China-EU or Latin America-China-US. The opportunity also exists for the developed consumer economies of the EU, US and Japan to make use of existing bilateral trade discussions with China, and broaden the scope of these to include a resource consumption aspect. The triangular approach should therefore be viewed as a tool that can contribute to the transition towards a global circular economy.

各国间需要建立三角关系, 以开展可持续全球化讨论, 如在非洲-中国-欧盟间建立三角关系和在拉美-中国-美国间建立三角关系。例如, 欧盟、日本和美国能够利用同中国间的现有双边贸易讨论, 扩大讨论的范围, 把资源消费方面也涵盖进去。三角模式应当作为能够促进向全球循环经济转型过渡的一个工具。

5.1.1. Dialogues within and between government officials, companies and NGOs should be initiated in areas of particular importance. These might include energy, forests, water, and agriculture, as well as construction, retailing and city planning. Such discussions should address the issues from the perspectives of all three elements of the global economy. A resource perspective will seek to explore sustainability impact assessment for outward investments, while a production/manufacturing perspective will investigate the opportunities which exist to develop new products and services that can provide a high quality of life with low resource consumption. Finally, a consumption perspective will examine sustainable and less resource-intensive consumption patterns and lifestyle choices. These perspectives are addressed in Sections 5.3 to 5.5.

5.1.1. 在一些特别重要的领域, 政府官员、公司和非政府组织间应当开展对话。这些领域可能包括能源、森林、水和农业, 以及建设、零售和城市规划等。讨论应当从3个不同的角度进行。第一, 资源的角度, 探索境外投资的可持续性影响评估; 第二, 生产/制造的角度, 探索研发新产品和新服务的机会, 使用很少的资源就能提高生活质量; 第三, 消费的角度, 探索可持续地利用自然资源的新生活方式和消费模式。“三角模式”的这三个部分将在下文第5.5-5.7节作进一步的探讨。

5.1.2. Countries that are heavily dependent on exports of natural resources should be supported by both producing and consuming countries to move up the value chain in a sustainable manner, in order to reduce their dependence on increased extraction of these natural resources and thereby improve their terms of trade. This could occur in many ways. For example, consuming countries could ensure that their public procurement policies support innovation in resource-rich and manufacturing countries. Companies should also develop systems to use their supply chains to encourage innovation, instead of simply ceasing to do business with those suppliers that fail to meet minimum standards, as is often the case. At the same time, producing countries should develop models which encourage dialogue regarding mutually beneficial economic development. Moving up the value chain can for example include the sustainable use of renewable energy.

5.1.2. 生产和消费国家应当支持严重依赖自然资源的国家按可持续的方式向价值链上游转移, 应当支持它们降低对增加消耗自然资源的依赖程度, 进而改善贸易条件。有很多方式可以做到这一点。消费国家应当确保自己的公共采购支持自然资源富裕型和制造型国家的创新行动。公司应当建立相应的制

度,借助供应链来鼓励创新,而不是如目前这样,只是设法淘汰未能达到最低标准的供应商。生产国家应当建立适宜的模式,鼓励就互惠型经济发展开展对话。

5.1.3. As moving up the value chain in a certain industry within a country can lead to increased use of natural resources, because supply chain constraints are taken out of the equation, there is a need to assess the long term implication of all industrial policies.

5.1.3. 一国内的特定行业通过向价值链的上游转移,将会增加自然资源的利用,由于这将使得供应链约束条件不复存在,因此需要评估所有产业政策的长期影响。

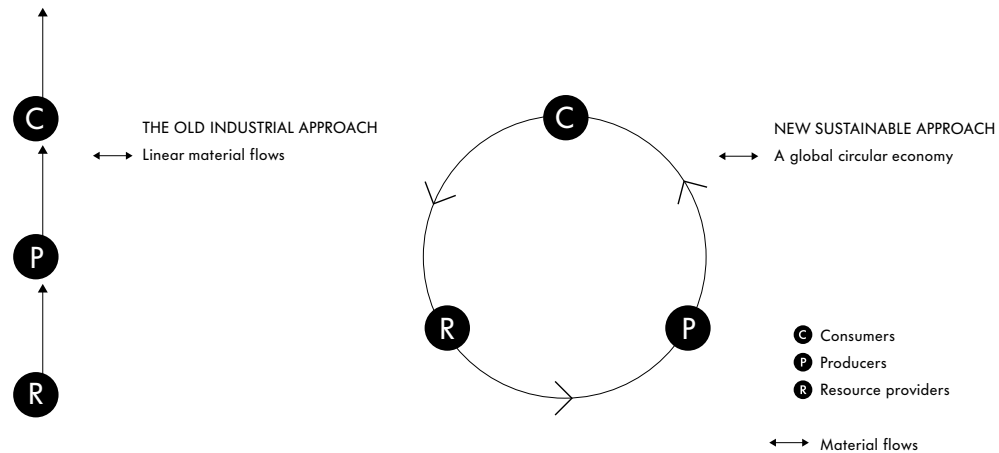
5.1.4. All triangular initiatives should, as far possible, build on existing fora and processes, for example, IBSA, G77, G24 and BOAO.¹²⁹ These fora provide opportunities to bring together leaders from different countries, as well as from different spheres of interest such as government and business, in order to discuss sustainability strategies as an integrated element of economic development and core business. All too often sustainability initiatives are dealt with in peripheral fora, in which few decision-makers participate.

5.1.4. 所有的三角关系行动计划都应当尽可能地以借助现有的论坛和流程,如印度-巴西-南非三方对话论坛、77国集团、24国集团和博鳌论坛¹²⁹。这些论坛提供了机会,让最高领导人汇集到一起,共同磋商,把可持续性战略作为经济发展和企业核心利益的不可缺少的组成部分。在少数具有重大决策权的人参与的外围论坛中,也经常议定可持续性行动计划。

5.2 Promote a ‘global circular economy’

促进“全球循环经济”

Figure 13 From a linear to a circular economy



The lifestyles promoted in highly developed consumer economies continue to utilise unsustainable amounts of natural resources. In order to address this trend it is necessary to depart from current linear models of economic development, which do not recognise the fact that the planet possesses finite quantities of natural resources, and start exploring the means by which a resource-efficient global ‘circular economy’ can be supported. Such a global circular economy envisions a situation in which all material flows are efficiently utilised and the idea of “waste” is eradicated. In order for this to occur in a sustainable fashion, many local circular economies will need to be created, as local production and consumption often is the most resource-efficient manner in which to increase welfare. The challenge, however, as well as the opportunity, lies in replicating such local circular economies on an international scale, since this will provide the major opportunity for lowering the current unsustainable levels of resource consumption, especially since very few attempts have been made in the past to ensure that global resource flows are sustainable.

西方工业经济体倡导的生活方式继续不可持续地消耗大量的自然资源。为了应对这个趋势，有必要摒弃现行的经济发展线型模式，开始探索能够支持节约资源型的“全球循环经济”方法。

5.2.1. Leading companies should investigate means by which their core businesses activities can contribute to a global circular economy. Any company that utilises significant amounts of natural resources in any part of their supply chain, should develop strategies for sustainable, and preferably reduced, use of those resources. As an example, WWF is already collaborating with the furniture manufacturer IKEA to explore this approach. In this regard, the experiences of companies in China which have explored ways to contribute to a circular economy should be utilised.¹³⁰

5.2.1. 主要公司应当集中力量考察自己的核心业务, 探索如何才能促进全球循环经济。在其供应链的任何部分消耗大量或者珍稀材料的任何公司都应当绘制可持续使用这些资源, 甚至是减少使用这些资源的路线图。世界自然基金会已经正在和宜家 (IKEA) 合作, 共同探索这条途径。中国企业已经探索出促进循环经济的方式, 中国的经验应当予以利用。

5.2.2. As opportunities to move towards a global circular economy are explored, it is important to consider key factors such as proximity, security and resource efficiency. Furthermore, it is also important to apply a degree of circumspection in cost-benefit calculations, as these are generally based on current market prices. When the cost efficiency of implementing steps towards a global circular economy are assessed, it should be noted that, besides the fact that many elements of costs are ignored or externalised, current prices are also a partial reflection of an infrastructure that often promotes unsustainable practices, while providing disincentives for sustainable practices. For example, an existing road infrastructure makes it more attractive and, indirectly, less expensive to own a vehicle, while a lack of telecommunications infrastructure mitigates against telecommuting and services such as videoconferencing. Cost estimates must therefore take into account possible future price fluctuations, as well as possible infrastructure developments, with the result that certain solutions are viewed as more attractive than others.

5.2.2. 在探索向全球循环经济转化机会的过程中, 重要的是要考虑一些关键因素, 如邻近、安全和资源效率。此外, 由于通常根据市场现价进行成本效益计算, 因此, 仔细进行成本效益计算也很重要。在评估向全球循环经济转型的成本效率时, 很重要的一点是要记住, 除了许多成本被忽视/外因化以外, 那些通常妨碍可持续做法, 助长不可持续做法的基础设施也会影响到现行价格。由于这些变化会促进和抑制某些解决方案, 因此, 成本估算必须考虑未来可能的价格变化和基础设施变化。

5.2.3 Many companies have reached a point of specialisation in their core activities which make it virtually impossible for them to move in a sustainable direction, for example, oil and mining companies. Such specialisation is as a rule beneficial to companies, but it may also lead to companies in certain inherently unsustainable industries being threatened by sustainability initiatives, and in some cases therefore, actively attempting to discourage such initiatives. As the Chinese government now is looking beyond simple economic indicators such as GDP in measuring progress, engagement with state-owned companies in China provides an opportunity for broader social concerns to be integrated into core business practices while remaining in a competitive environment. A number of private companies, such as Tetra Pak and IKEA, have also shown that marrying long-term investments and sustainability concerns can sometime occur more easily outside the stock market. These Chinese state-owned enterprises (SOEs) could therefore play an important role in this regard.

5.2.3. 目前, 许多公司专业经营的方式让其很难朝着可持续方向发展, 例如, 石油公司、矿业公司。尽管专业经营的能力通常很有益, 但是却也会使公司陷入感受到可持续性行动计划威胁的境地(就像目前的大多数石油公司和汽车公司一样)。中国的国有企业在继续在竞争环境中谋求发展的同时, 也提供了一个融合更广泛的社会忧虑问题的机会。私营公司的经验已经表明, 就结合考虑长期投资和可持续性的问题而言, 在股市外有时候能更容易地实现这一点。国有企业在这方面能够扮演重要的角色。

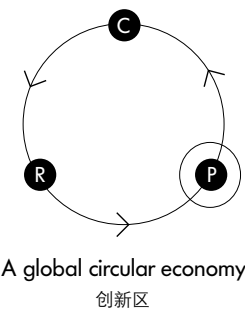
5.3 Production and Manufacturing – Explore innovation zones for new products and services

生产/制造—探索新产品和服务的创新区

Many of the innovations that influence the global economy currently originate in developed countries and therefore often target the middle and upper-income segments of society, both within these developed countries and abroad.

目前，影响全球经济的许多创新都是在富裕国家中研发出来的。这些创新经常面向这些富裕国家中收入丰厚的中上阶层，以及其它国家中的富有阶层。

Figure 14 Innovation Zones



As a result, there exists a significant lack of the type of innovation that addresses the requirements of developing and least-developed countries. Such innovation should be directed towards the development of products and services that create welfare within the carrying capacity of the planet, by encouraging the emergence of new patterns of production and consumption. Investments that encourage such innovation, for example through the creation of innovation centres and zones within emerging markets, should therefore be supported. At the same time, a system must be developed to differentiate between sustainable and non-sustainable investments,¹³¹ based upon which relevant institutions could support those investments that are shown to be sustainable.

在靠近新兴经济体和发展中国家的需求所在地，迫切需要支持发展创新中心和创新区。总体目标应当是通过发展新的生产模式和鼓励可持续消费模式，在这个星球承受能力的范围内，提供能改善福利的服务。应当探索和支持能够确保实现这个总体目标的投资活动。必须确立能区分可持续和不可持续投资的相应制度。因此，促进和支持投资的相关机构才能提出支持可持续发展的战略和目标。

5.3.1 Within companies, the development of sustainable innovation should be encouraged. This can be achieved relatively simply, for example through the establishment of a virtual ‘sustainable development zone’ on the company’s internal computer network, upon which

key challenges are posted and employees are encouraged to develop solutions to these challenges. Furthermore, inter-departmental collaboration should be encouraged, as innovative solutions usually require different types of expertise. Wherever possible, the challenges to be addressed should be selected in collaboration with external stakeholders such as local and central government, NGOs or other companies. In this regard, WWF is already working with Hewlett-Packard and several other companies to develop such zones.

5.3.1 应当鼓励在公司设立“可持续开发者领域”。这只需要在企业内部网上开辟一块地方,用于张贴公布关键挑战和鼓励员工提出解决这些挑战的方案。创新性解决方案通常需要各种不同的专业知识,因此,应当鼓励跨部门协作。只要有可能,应当同外部利害相关方——如地方和中央政府、非政府组织或者其它公司等——一起共同选择加以应对的挑战。

5.3.2 Within the academic world, it is important that new economic models and business strategies are explored. Traditional growth, industrial and trade models are failing to meet modern challenges such as specialised production, outsourcing, TNCs, global public goods, environmental thresholds, IPR, natural resource constraints, aging populations and many others. Joint initiatives are required in order to provide information on consumption patterns for natural resources based on differing strategies of production and manufacturing.

5.3.2 高等院校应当探索新的经济模式和业务经营战略。由于诸多因素的变化,如专业化生产、外包、跨国公司、全球公共货物、环保门槛、知识产权、自然资源约束因素、逐渐老龄化的人口等,传统的增长、工业和贸易模式已经不能适用于目前的挑战。有必要开展联合行动计划,提供全世界自然资源使用情况因不同的生产/制造战略而改变的信息。

5.3.3 Collaborative efforts between emerging economies could be initiated to report progress and share experiences of using FDI to move up the value chain and reduce the demand for natural resources. This should link to ongoing work in organisations such as UNCTAD, UNDP and UNEP. Links between progress on key environmental performances, such as use of natural resources for certain services and different kind FDI flows, should be explored in the reports that result from such collaborations.

5.3.3 在使用外商直接投资,向价值链上游转移和减少对自然资源需求的方面,针对如何报道所取得的进步和共享相应的经验也可以开展联合行动。这种联合行动应当同一些国际组织中正在进行的工作联系起来,如联合国贸易与发展会议、联合国开发计划署和联合国环境规划署。在这些机构的报告中应当探索关键环保性能改进(如某种服务的自然资源使用情况)和不同的外商直接投资流之间的联系。

5.3.4 Through its public procurement, the Chinese government can increase its support to companies that use fewer natural resources or invest in innovative solutions, both within China and abroad.¹³² An example in this regard might be the use of a service-based rather than a product-based approach, in which the consumption of natural resources per service provided could be used as a criterion for the awarding of procurement contracts.¹³³

5.3.4 中国政府可以增加公共采购量,借此支持那些自然资源使用量少的制造公司和投资寻求能减少国内外自然资源消耗的创新方法的公司^{ac}。执行服务导向而不是产品导向的办法,在采用此方法时,比如说,单位服务的自然资源使用量可以作为甄选未来采购的一个标准。

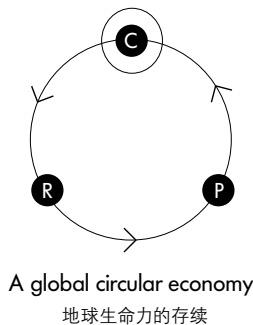
5.4 Consumption – Explore new opportunities to provide welfare with reduced use of natural resources

消费——探索能降低自然资源使用量提供福利的新机会

Many trends, for example population growth, urbanisation, increased use of natural resources, and growing inequity are currently converging. By studying these trends, possibilities and opportunities for new initiatives that promote sustainable consumption patterns can be identified.¹³⁴

境外投资能够支持可持续发展, 但是, 只有在有配套的框架时才会如此。许多趋势, 例如, 人口统计特征、自然资源使用量增加、城市化、不公正加剧等, 目前正在汇聚到一起。研究这些趋势, 我们就能够甄别出能促进可持续消费模式的新行动计划的可能性和机会^{ae}。

Figure 15 Welfare for a living planet



5.4.1. A shift is required in economic planning and business strategies from an emphasis on products to one on services. Instead of simply accepting current consumption patterns in areas such as energy usage, transportation, communication, waste disposal etc, strategies for sustainable consumption should be developed, based upon the services required by society. In this manner, homes might become net producers of electricity, telecommuting could be encouraged, consumption of paper decreased and waste recycling systems implemented. In order for such innovations to occur, however, it will be necessary for governments to begin integrating resource efficiency into both the economic planning and the criteria for infrastructure investments. In doing so, they will challenge companies to deliver innovative solutions.

5.4.1. 在进行经济规划时, 从产品规划转向服务规划很有必要。不要假设高的能源用量、汽车用量和纸张用量等, 而应当提出可持续消费战略, 在这种战略中, 人们需求的服务是起点。住房可能成为电力净生产者, 弹性工作可能会受到鼓励, 人们可以每周在家工作一次。可以提倡使用数码文件等。要实现这

一点,一个最重要的因素可能就是政府开始把资源效率纳入到经济计划和基础设施投资的标准之中。在此过程中,政府将激励公司提出新的创新性解决方案。

5.4.2. The consumption of natural resources should be included in all national accounting, as well as in measures of individual well-being or satisfaction.¹³⁵ Wherever possible, this should also be implemented on a regional scale, in order to spur innovation and healthy competition. It is worth noting that China already possesses a growing middle class and is currently ranked third in the world in terms of consumption of high-end luxury goods.¹³⁶ The need to discuss measures for sustainable development beyond GDP is therefore something that cannot be ignored.

5.4.2.除了要纳入人民福利/满足的措施之中以外,自然资源的使用情况还应当纳入到所有的全国会计活动之中。只要有可能,这种方法也应当在区域范围内推行,以刺激创新和健康的良性竞争。值得注意的是中国的中产阶级不断扩大,目前,高档奢侈品消费量已经排在世界第三位。

5.4.3. In attempting to develop new patterns of consumption, it is necessary to consider where the resources that will allow societies to move towards sustainable solutions might come from. With the current high international oil prices, oil producing countries find themselves in a situation of possessing massive cash reserves available for foreign investment. Within progressive oil producing nations, there exist policy initiatives aimed at diversifying away from oil dependence. Through cooperation with rapidly emerging economies such as China, joint projects in this regard could be initiated. Instead of its current focus on outward investments in projects that secure oil supplies, China could initiate sustainability collaborations with countries such as Saudi Arabia and the UAE. Such collaborations could revolve around sustainable urban solutions with high welfare, advanced technology and low resource use.¹³⁷ As both China and many oil producing countries, especially in the Middle East, are experiencing rapid urbanisation, sustainable urban solutions could be an area in which both parties could gain significant benefits in both the short and long term.

5.4.3.关于资源的未来源泉,有必要进行创新性考虑,这有助于我们转向可持续解决方案。由于石油价格偏高,石油生产国家积攒有大量的现金储备,可用于国外投资。在这些激进的石油生产国家中,实行多元化经营,摆脱对石油依赖的政策和思想已经存在。它们可能会同如中国这样的快速发展的新兴经济体开展合作,实施联合项目。除了专注于投资能保障石油供应的项目以外,中国还可能会同沙特和阿联酋等国家开展可持续性的协作。这些有关可持续城市解决方案的协作涉及到高福利、先进技术和低资源使用。由于在中国和许多石油生产国家,特别是中东地区各国,目前城市化发展的进程迅猛,因此无论从短期还是从长期角度来说,可持续城市解决方案可能会是双方都能获得重大益处的一个领域。

BOP [Bottom of the Pyramid, where four billion people live on less than \$2/day] will force us to come to terms with the use of resources in ways that we have not so far. Whether it is in [the] use of fossil fuels for energy and transportation, water for personal cleanliness, or packaging for safety and aesthetics, ecological sensitivity will become paramount. I believe that more innovative, sustainable solutions will increasingly emerge from serving the BOP markets than from the developed markets.

C.K. Prahalad, 2005

“我们的目标并非危言耸听。金字塔底层（BOP，指每天生活开支不足2美元的40亿人）将迫使我们采取全新的方式来协调资源的使用。不管是在能源和交通领域使用化石燃料，来水来实现个人卫生，还是用包装来实现安全和美观，生态敏感性都将是极为重要的考虑。我相信，将来会有越来越多的创新、可持续发展的解决方案源于金字塔底层的需求而非发达国家市场的需求。”

C.K. Prahalad, 《金字塔底层的好运》

5.4.4. Government, business and academia should explore ways in which investments can be directed to support resource efficiency. Consumption that results in a reduction in resource dependence should be encouraged, such as visits to parks by public transport, dinners at restaurants serving local food and classical concerts. The Government policies and regulations required to support investment that leads to such consumption patterns, should be implemented. Investments in information and communication technology (ICT) infrastructure such as broadband and 3G, could, for example, allow for increased application of videoconferencing and telecommuting, thereby reducing business-related travel and commuting.¹³⁸ Investments in bio-energy could provide local fuel supplies and employment opportunities. In a similar fashion, investments in new urban solutions could make flexible work, cycling and public transport more attractive.

5.4.4.企业和高等院校应当探索如何引导投资，支持提高资源效率。应当分析哪些消费能减轻对自然资源的依赖程度。例如，哪种贸易和投资规定可能支持不需要目前依赖于石油的消费模式？例如，可以投资信息与通讯技术，如宽带和3G手机，以增加视频会议和在家工作或者远程办公室的可能性，因此，减少通勤的必要性。投资生物能源既可以向当地提供燃料供应，又可以增加就业机会。同样地，投资新的城市解决方案可以增加弹性工作方式，使用自行车和公共交通的便利性，更受人们的欢迎。

5.4.5. Systems to track the environmental impact of trade flows, including ‘virtual goods’ such as water consumed in the production of export products, should be implemented, in order to ensure that the infrastructure which is developed will not lock countries into unsustainable long-term development paths.¹³⁹

5.4.5.应当鼓励建立追踪了解贸易流环境影响的系统，包括“虚拟货物”，如生产出口产品过程中的用水，以确保所建设的基础设施不会使该国家对不可持续地使用资源方式形成依赖，陷入损伤长期可持续竞争力的境况。

5.4.6. Responsible public procurement should be utilised as a tool to support both sustainable consumption and sustainable development in China, thereby reducing the demand for natural resources. Instead of a product-based procurement, a service-based system should be encouraged in order to spur sustainable innovation.

5.4.6.公共采购可以减轻对全球资源的压力，进而支持中国的可持续消费和可持续发展。

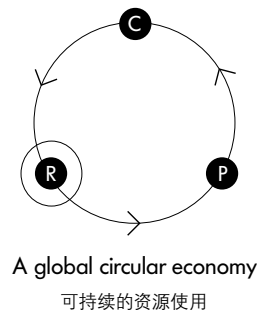
5.5 Natural resources – Explore sustainability impact assessment for outward investments

自然资源—探索境外投资可持续性影响评估

Although this report focuses on the long-term structural changes required to promote sustainable development and reduce the consumption of natural resources, it is acknowledged that such resources will continue to play a vital role in creating welfare and eradicating poverty across the world. It is therefore vital to ensure that the consumption of natural resources occurs in a manner which minimises environmental impact and maximises social contribution. China, with its growing acquisition of natural resources worldwide, therefore has the opportunity to be one of the world's most influential voices for improving environmental governance on a global level.

尽管本报告重点探讨需要进行哪些必要的长期结构变化，以促进可持续发展和减少自然资源使用。但重要的是要确保按最大限度地减小环境影响和最大限度地扩大社会贡献的方式来使用自然资源。

Figure 16 Sustainable resource use



5.5.1. The publication of corporate guidelines could be explored by the Chinese government, particularly in terms of issues such as transparency and reporting. The implementation of standards such as those of the Global Reporting Initiative (GRI) should be explored. In terms of voluntary guidelines, Chinese companies engaged in the forestry industry could for example implement the standards prescribed by the Forest Stewardship Council (FSC).

5.5.1. 中国政府可以探索编制企业指南。透明度和汇报制度是两个最重要的标准，如应当研究《全球报告行动倡议》中的企业指南。在有关公司和自己的未来框架的对话中必须包括关键参与者，如进出口银行和中国信用保险公司。

5.5.2. Key actors such as the China Exim Bank and Sinosure should be included in dialogues regarding future sustainability frameworks, both for companies and leading institutions. For both Sinosure and Exim Bank, the opportunity exists to implement the OECD Common Approaches on the Environment, which serve as an environmental standard for export credit agencies.

5.5.2. 诸如中国进出口银行和中国出口信用保险公司这样的关键角色，应当参与有关公司和主要机构未来可持续性框架的对话。对中国出口信用保险公司和进出口银行而言，有机会可以实施经合组织环境共同措施这一针对出口信用机构的一套环境标准。

5.5.3. Chinese and foreign governments should, wherever possible, jointly explore means by which to develop criteria for public procurement, that will ensure that most sustainable utilisation of natural resources, both directly in the manufacturing process and indirectly in the life cycle of the products and services that are procured. Companies that fail to prove that they analyse the environmental impact and resource consumption during all facets of the development, manufacturing and promotion process of their products, should be declared ineligible for government contracts.

5.5.3. 如果可能，中外政府应当联合探索相关方法，制定公共采购的标准，确保在产品和服务的生命周期之中直接和间接使用的自然资源按可持续方式得到使用。在产品研发、市场营销战略和投资战略等文件中，不能证明自己业已对终产品的环境影响和资源使用进行过分析的公司不准获得政府合同。

5.5.4. China could initiate a dialogue among resource-rich developing and least-developed countries concerning standards for natural resource exploration. This should be based on existing initiatives, such as the World Bank Extractive Industries Review. China could also initiate discussions regarding economic development models that will allow emerging economies to reduce their natural resource dependence.

5.5.4. 围绕自然资源勘探标准这个议题，中国可以同资源富裕型的贫穷国家开展对话。对话应当以已经存在的行动计划作为基础，如世界银行天然资源产品评论。中国还可以针对降低新兴国家对自然资源依赖的经济发展等议题开展讨论。

5.5.5. The development of the concept of payment for environmental services (PES) should be encouraged. Although PES in itself is insufficient to reduce natural resource consumption, it provides an opportunity to include externalities that are often ignored when calculating the cost of natural resource utilisation.

5.5.5. 鼓励发展有偿使用环境服务的模式。尽管只采用有偿使用环境服务的模式不够，它只是许多手段之一，但是它提供了把外部效应纳入考虑的一个机会，在使用自然资源时，人们经常忽视了这些外部效应。

5.5.6. Attempts should be made to ensure that sustainability assessments include global public goods, in order to safeguard against long-term negative trends. These assessments should include both environmental issues such as water and climate change, and the potential for conflicts over natural resources.¹⁴⁰

5.5.6. 确保可持续性评估包括全球公共货物，以避免长期的负向趋势。这些评估应当既包括环境问题，如水和气候变化，而且也应当包括可能出现的自然资源相关冲突。

5.5.7. Chinese companies could export their established best practices with regards to use of natural resources and ensure that they follow at least the same standards as in China when operating abroad. China's Policy on Mineral Resources is one example of a document that can be utilised in this regard.¹⁴¹

5.5.7. 中国企业可以向外推广他们业已建立的，有关自然资源利用的最佳行为规范，并且确保他们在国外的业务至少遵循国内的相关标准。在这方面，《中国的矿产资源政策》白皮书是可以加以利用的一份文件。

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APPENDIX
ENDNOTES

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APPENDIX 1

SELECTED CHINESE OVERSEAS INVESTMENT PROJECTS 2000-2006¹⁴²

Time	Acquiring Firm	Target Firm/Activity	Industry	Location	Acquisition Value	Source
1998	China Nonferrous Metal Mining Group	Acquired 85% of Chambishi Mine	Mining	Zambia	US\$ 20 m.	http://www.cctv.com/news/china/20041107/101042.shtml
2001	Baosteel	CVRD	Mining	Brazil	US\$ 19 m.	http://www.businessmonthly.com.cn/chinese/zybk/topics/disp.asp?id=90
2002	Baosteel	joint venture with Hamersley Iron, a subsidiary of Rio Tinto	Mining	Australia	AU\$ 57 m.	http://www.chinatrade-news.com.cn/old/20031104/3.htm
2002	Capital Steel	Rio Tinto, etc.	Mining	Australia	AU\$ 20 m.	http://www.chinatrade-news.com.cn/old/20031104/3.htm
2002	CNOOC	Repsol-YPF/ part of equities of five oil and gas assets	Oil and gas	Indonesia	US\$ 585 m.	http://www.cnooc.com.cn/defaulten.asp
2002	CNOOC	BP/Tangguh Liquefied Natural Gas Project	Oil and gas	Indonesia	US\$ 275 m.	http://www.cnooc.com.cn/defaulten.asp
2002	Petrochina (a subsidiary of CNPC)	Devon Energy	Oil and gas	Indonesia	US\$ 216 m.	http://210.78.134.66/english/xwhgg/englishnews/page54.html
2003	CNOOC	Australian Northwest Continental Shelf Natural Gas Project	Oil and gas	Australia	US\$ 348 m.	http://www.cnooc.com.cn/defaulten.asp
2003	Petrochina (a subsidiary of CNPC)	Amerada Hess Indonesia Holdings Co	Oil and gas	Indonesia	US\$ 82 m.	http://210.78.134.66/english/xwhgg/englishnews/page79.html
2003	Sinochem	Petroleum Geo-Services (PGS)	Oil and gas	U.A.E.	US\$ 105 m.	http://www.chinataiwan.org/web/webportal/W5029287/A5414463.html
2003	Sinochem	Conoco Philips	Oil and gas	Ecuador	US\$ 100 m.	http://www.china.org.cn/english/2003/Dec/82349.htm#
2003	Sinopec Group	BG	Oil and gas	Kazakhstan	US\$ 615 m.	http://www.sinopec.com/newsevent/news/4.shtml
2004	Baosteel	a joint venture. with CVRD, etc	Mining	Brazil	n.a.	http://www.china.org.cn/chinese/2004/Feb/489542.htm
2004	Aluminum Corp of China Ltd.Chalco	Establish a joint venture with Companhia Vale do Rio Doce of Brazil	alumina production	Brazil	US\$1 billion (phase I project)	http://www.chinadaily.com.cn/english/doc/2004-08/25/content_368524.htm
2004	China Nonferrous	Signed agreement on	Mining	Myanmar	US\$ 500 m.	http://www.cnmm.com/news/05.htm

	Metal Mining Group	nickel exploration and feasibility study with Myanmar				
2004	CNPC	In cooperation with KazMunai Gaz (KMG)	Oil pipeline	Kazakhstan-China	US\$ 3 b.	http://www.china.org.cn/english/international/89110.htm
2004	Sinochem	Inchon Oil Refinery Co	Oil and gas	South Korea	US\$ 553 m.	http://en.ce.cn/Markets/Currencies/200412/23/t20041223_2652348.shtml
2004	Sinopec Corp.	First Int'l Oil Company	Oil and gas	Kazakhstan	US\$ 160 m.	http://www.sudantribune.com/article.php3?id_article=6116
2004	Sinochem Corp	Inchon Oil	refiner	South Korea	US\$549 m	http://www.chinadaily.com.cn/english/doc/2004-09/28/content_378297.htm
2004	Sinopec Corp.	a JV with ARAMCO	Oil and gas	Saudi Arabia	US\$ 300 m.	http://english.people.com.cn/200403/08/eng20040308_136844.shtml
2005	Lenovo	Acquired IBM's PC division	personal computer business	USA	US\$1.75 b	http://www.chinadaily.com.cn/english/doc/2005-03/10/content_423695.htm
2005	Nanjing Automobile Group Corp	Acquired MG Rover Group	car production and engine business	Britain	US\$87 m	http://www.chinadaily.com.cn/english/doc/2005-07/23/content_462703.htm
2005	China Metallurgical Construction Group Corp (MCC)	Acquired an 85 per cent stake of the Ramu nickel deposit	Nickel and Cobalt	Papua New Guinea	US\$650 m	http://www.chinadaily.com.cn/english/doc/2005-05/20/content_444181.htm
2005	Andes Petroleum Company (a consortium led by CNPC and Sinopec)	Acquired EnCana's Ecuador assets	Oil and pipeline interests	Ecuador	US\$1.42 b	http://www.chinadaily.com.cn/english/doc/2005-09/16/content_478235.htm
2005	CNPC (through its subsidiary CNPCL)	Acquired 100% of Canada-based Petro Kazakhstan Inc. (PK)	Oilfields and refineries	Kazakhstan	US\$ 4.18 b	http://service.china.org.cn/link/wcm/Show_Text?info_id=146767&p_qry=pk
2005	CNPC and India's Oil and Natural Gas Corp (ONGC)	Acquired a Canadian oil company's 37 per cent stake in Syria oilfields	Oil	Syria	US\$581 m	http://www.chinareform.net/Article_Show.asp?ArticleID=354 http://www.chinadaily.com.cn/english/doc/2005-12/22/content_505437.htm
2005	Beijing	acquired Seiyu	retail	Singapore	US\$2.36 m	http://www.chinareform.net

	Hualian Group	Singapore of Japan-based Seiyu Ltd	department store			net/Article_Show.asp?ArticleID=354
2006	CNOOC	South Atlantic Petroleum Ltd. buy a 45 percent stake in an oil block off the coast of Nigeria	Oil	Nigeria	US\$ 2.7 b	http://www.chinadaily.com.cn/china/2006-04/20/content_572737.htm http://www.chinadaily.com.cn/bizchina/2006-07/20/content_645131.htm
2006	China Minmetals Corporation	Establish a Joint venture with Chile's Codelco,	Copper	Chile	US\$2 b (initially invest US\$550 million)	http://www.chinadaily.com.cn/english/doc/2006-01/04/content_508989.htm
2006	Sinopec	Acquire stakes in Angolan oil exploration blocks	Oil	Angola	US\$ 2.4 b	http://www.chinadaily.com.cn/china/2006-06/13/content_616030.htm
2006	Sinopec	Deal to explore oil block in Iran	Gas and oil	Iran		http://www.chinadaily.com.cn/china/2006-06/22/content_622958.htm

- 1 Zhao Chuang, Ministry of Commerce at the 2006 International Investment Forum in Xiamen. Available at http://www.chinadaily.com.cn/bizchina/2006-09/09/content_685208.htm
- 2 http://www.chinadaily.com.cn/bizchina/2006-09/09/content_685208.htm
- 3 While China is a large country, the per capita resources of China are relatively small. When Chinese experts worked with China's Agenda 21 they estimated that in 1989 the per capita fresh water, cultivated land, forest and grassland of China comprised 28.1 percent, 32.3 percent, 14.3 percent, and 32.3 percent of the world's average, respectively. In addition, they also stated that the per capita resources figures and ecological quality were either declining or deteriorating. China's high population density has resulted in a situation where China is already overshooting its biological capacity, and this is topped by the need for those products that China exports. See http://www.footprintnetwork.org/gfn_sub.php?content=footprint_china for details.
- 4 http://en.ndrc.gov.cn/hot/t20060529_71334.htm
- 5 See Chapters 1, 6 and 9 in the five-year plan. Available at http://en.ndrc.gov.cn/hot/t20060529_71334.htm
- 6 See, for example: *World Investment Report 2005*, www.unctad.org/en/docs/wir2005_en.pdf and <http://www.millenniumassessment.org/en/index.aspx>
- 7 See, for example: http://www.panda.org/news_facts/publications/key_publications/living_planet_report/index.cfm
- 8 See, for example www.oecd.org/dataoecd/54/58/37010986.pdf and www.unctad.org/en/docs/wir2006ch5_en.pdf
- 9 See, for example, 'China in the World Economy' by Hong SONG., http://www.larouchepub.com/other/2005/site_packages/june28-29_berlin/3229dr_song_hong.html
- 10 http://www.chinadaily.com.cn/china/2006-11/13/content_730956.htm
- 11 http://english.people.com.cn/200409/20/eng20040920_157654.html
- 12 http://www.economist.com/business/displaystory.cfm?story_id=4352026
- 13 <http://www.un.org/ecosocdev/geninfo/afrec/vol18no1/181asia.htm>
- 14 <http://news.bbc.co.uk/1/hi/business/5360890.stm> and http://www.cafod.org.uk/policy_and_analysis/rough_guides/transparency
- 15 <http://www.idrc.ca/plaw/> and http://www.iadb.org/laeba/downloads/WP_28_2004.pdf
- 16 www.globalwitness.org/about_us/downloads/ANNUAL%20REPORT.pdf
- 17 Walden Bello, China Provokes Debate in Africa, <http://www.fpif.org/fpifxt/4065>, and David Zweig & Bi Jianhai, China's Global Hunt for Energy, <http://www.foreignaffairs.org/20050901faessay84503/david-zweig-bi-jianhai/china-s-global-hunt-for-energy.html>
- 18 See, for example, Layard, 2005, especially the chapter 'The National Income: A Sorry Tale', pp. 133-47. R. Easterlin, in his book entitled *Growth Triumph*, captures this as well: 'Economic growth is indeed triumphant, but to no point. For material prosperity does not make humans happier: the "triumph of economic growth is not a triumph of humanity over material wants; rather, it is the triumph of material wants over humanity'.
- 19 http://english.people.com.cn/200603/08/eng20060308_248947.html
- 20 For a discussion on the definition of Chinese outward investment see section 2.1
- 21 See 'China Under Resource & Environmental Constraints', *China Economist*, March 2006, pp. 11-23.
- 22 <http://siteresources.worldbank.org/INTEAPINFRASTRUCT/Resources/855084-1137106254308/ResourceRequirements.pdf>
- 23 <http://www.millenniumassessment.org/en/BoardStatement.aspx>
- 24 See, for example, 'China's march into Africa', *African Business*, July 2006, no. 322.
- 25 The role of China in the world economy is of course much more complex. For a discussion on China's role, please see Chapter 3.
- 26 For a discussion about the definition of Chinese outward investment see section 2.1.
- 27 For further information about solutions like e-governance and flexible work see 'Sustainability at the Speed of Light' and 'Saving the Climate @ the Speed of Light', both available at www.panda.org/ict.
- 28 Between 2004 and 2005 the proportion of the state-owned enterprises to the whole domestic investment entities declined to 29% from 35%.. See p. 117, *Statistical Bulletin of China's Outward Foreign Direct Investment*, 2005.
- 29 During this time it became obvious that it was important to stay away from two simple approaches that would be tempting to highlight if current approaches to China where to be used. The first approach that was avoided is a perspective where Chinese outward investments is seen as a threat to the environment and current western interest. The second approach that was avoided is a perspective where all the money from Chinese investments is seen as an easy way for poor, but resource rich, countries to develop. Putting aside these two approaches this report attempts to place the rise of Chinese outward investments in a broader perspective and also explore the drivers of the global economy that direct these flows.
- 30 See, for example, Wilson and Puruthothaman, 2003. Available at: <http://www.gs.com/insight/research/reports/report6.html> or the PWC's report: 'The World in 2050: How Big Will the Major Emerging Market Economies Get and How Can the OECD Compete?'

- at [http://www.pwc.com/extweb/pwcpublishations.nsf/docid/56DD37D0C399661D852571410060FF8B/\\$file/world2050emergingeconomies.pdf](http://www.pwc.com/extweb/pwcpublishations.nsf/docid/56DD37D0C399661D852571410060FF8B/$file/world2050emergingeconomies.pdf). Measured on a purchasing power parity (PPP) basis, China in 2003 stood as the second-largest economy in the world after the US (<http://www.cia.gov/cia/publications/factbook/geos/ch.html>). Other experts think China will rise even faster. On the cover of the book *The Chinese Century* by Oded Shenkar it is written, 'Within 20 years--possibly far sooner--China will have the world's largest economy. That will powerfully impact you: your job, your company, your economic future, and your country.'
- 31 Zhao Chuang, Ministry of Commerce at the 2006 International Investment Forum in Xiamen. Available at: http://www.chinadaily.com.cn/bizchina/2006-09/09/content_685208.htm
 - 32 Nation sees soaring investment overseas, http://www.chinadaily.com.cn/english/doc/2005-11/28/content_498566.htm
 - 33 http://www.bjreview.com.cn/business/txt/2006-12/22/content_51693.htm
 - 34 http://www.chinadaily.com.cn/bizchina/2006-09/09/content_685208.htm
 - 35 http://www.chinadaily.com.cn/bizchina/2006-05/11/content_587003.htm
 - 36 UNCTAD, *World Investment Report* 2004, p. 27, for the cumulative figure up to 2003.
 - 37 UNCTAD, *World Investment Report* 2002, p. 103. It is possible that these three Chinese companies might have been qualified for the top 50 list earlier than the year 2000 but were not due to the fact that their 'data were not available in 1999'. Despite this it is still true that globalisation of Chinese companies is growing rapidly.
 - 38 'More Chinese firms make it into Fortune Global 500 this year', Channel NewsAsia, 13 July 2005. Available at: http://www.channelnewsasia.com/stories/afp_asiapacific_business/view/157770/1.html
 - 39 <http://money.cnn.com/magazines/fortune/global500/2006/countries/C.html>
 - 40 *World Investment Report* 2004, pp. 26-27. In addition, one example is of Milton Kotler who summarized 24 strategies for Chinese companies' 'Going Global'. Available at: <http://www.people.com.cn/GB/paper2086/12190/1097087.html>
 - 41 See Song Hong, 2005, p. 4.
 - 42 For example, Prahalad, 2005; Hart, 2005; and, Muhammad Yunus, founder of the Grameen Bank.
 - 43 <http://www.mofcom.gov.cn/static/column/b/bf.html/1>; http://www.coudert.com/publications/articles/031215_14_preinvest_clp.pdf; <http://www.mofcom.gov.cn/aarticle/b/bf/200410/20041000295100.html>; <http://www.safe.gov.cn/law/law563.htm>
 - 44 'Exporting Chinese capital', *China Economic Review*. Available at: <http://www.chinaeconomicreview.com/subscriber/articledetail.php?id=51>
 - 45 'Exporting Chinese capital', *China Economic Review*. Available at: <http://www.chinaeconomicreview.com/subscriber/articledetail.php?id=51>
 - 46 Tenth Five-Year Plan for National Economic and Social Development is available at <http://www.people.com.cn/GB/shizheng/16/20010318/419582.html>
 - 47 <http://www.mofcom.gov.cn/aarticle/b/bf/200410/20041000295100.html>
 - 48 <http://www.info.gov.hk/gia/general/200501/26/0126135.htm>
 - 49 Matthew Forney, 'China's Going-Out Party', *Time* (Asia), 17 January 2005. Available at: <http://www.time.com/time/asia/magazine/article/0,13673,501050124-1018167,00.html>
 - 50 See www.worldbank.org.cn/English/Overview/overview_brief_miga.htm. MIGA has plans to follow up the workshop in several ways. First, MIGA is collaborating with the Foreign Investment Advisory Services (FIAS) in investigations and analyses on outward investment from China. The study has three main parts (1) interviews and case studies on selected overseas investors; (2) a survey of 150 Chinese companies investing or with an interest in investing overseas; (3) preparation of a report summarizing findings and presentation at a FY06 IFC seminar on South-South investment that will be convened in India. This work is in keeping with MIGA's established work program in China as well as keeping with MIGA's corporate strategy, with regard to the promotion of South-South investment. In addition, MIGA has recently signed a new memorandum of understanding (MOU) with the China Export & Credit Insurance Corporation (Sinosure). The purpose of the new MOU is to expand the cooperation between MIGA and Sinosure, particularly in the area of supporting Chinese outward investment by providing coinsurance and reinsurance for projects. Both parties have recognised the following key aspects for cooperation: (1) development of better communication and information exchange between MIGA and Sinosure; (2) organizing training programs in underwriting and reinsurance; (3) development of joint efforts to reach out to Chinese companies wishing to invest abroad; (4) staff exchanges focused on specific underwriting efforts; and (5) forming a technical team to review the issues of documentation harmonization, etc. A series of 'road shows' in China--forums to increase investors' awareness about political risk insurance/guarantees--is slated to begin in the fall of 2005 as a key first step under the MOU.
 - 51 http://english.eximbank.gov.cn/info/Article.jsp?a_no=1315&col_no=84
 - 52 The Exim Bank of China, 2005 Annual Report, p. 5.
 - 53 Peter Bosshard, 'Export Credit Agencies and Environmental Standards: An Invitation to Join the Dialogue', International Rivers Network, December 2006. Peter Bosshard is Policy Director, International Rivers Network.

- 54 Peter Bosshard, 'Export Credit Agencies and Environmental Standards: An Invitation to Join the Dialogue', International Rivers Network, December 2006. Peter Bosshard is Policy Director, International Rivers Network.
- 55 The Exim Bank of China, 2005 Annual Report, pp. 6f.
- 56 China's Agenda 21, White Paper on China's Population, Environment, and Development in the 21st Century, Chapter 14. Available at: <http://sdep.cei.gov.cn/baipishu/chnwp14a.html>
- 57 See, for example, The Development of China's Marine Programs, Information Office of the State Council Of the People's Republic of China, July 1998, which states: 'the amount of freshwater resources per capita is only one fourth of the world's average. China is rich in land mineral resources, but the amount per capita is less than half the figure per capita worldwide.'
- 58 'China becomes the largest buyer in the world', China Economic Net, 27 December 2004. Available at: http://en.ce.cn/main/Insight/200412/27/t20041227_2676013.shtml
- 59 'China becomes the largest buyer in the world', China Economic Net, 27 December 2004. Available at: http://en.ce.cn/main/Insight/200412/27/t20041227_2676013.shtml
- 60 http://www.finfacts.com/irelandbusinessnews/publish/article_10007657.shtml
- 61 'More of everything: Does the world have enough resources to meet the growing needs of the emerging economies?', A Survey of the World Economy, *The Economist*, 16 September 2006.
- 62 Zhan, 1995; Wang, 2002.
- 63 Wu and Chen, 2001.
- 64 *The Economist*, 6 September 2003, p. 57. Also see Eunsuk Hong and Laixiang Sun, 2004, p. 10. Available at: <http://www.cefms.ac.uk/documents/research-28.pdf>
- 65 See, for example: China Fuels its Future with Africa's Riches by Sanusha Naidu and Martyn Davies in South African Journal of International Affairs. Development Effects of the Chinese Boom in Latin America by Roldan Muradian.
- 66 UNCTAD, 2004, p. 16. Available at: <http://www.unctad.org/Templates/WebFlyer.asp?intItemID=3342&lang=1>
- 67 Seth R. DeLong, 'Will Washington Tolerate Chinese-Venezuelan Pact', 17 January 2005. Available at: <http://www.scoop.co.nz/stories/WO0501/S00148.htm>
- 68 Seth R. DeLong, 'Will Washington Tolerate Chinese-Venezuelan Pact', 17 January 2005. Available at: <http://www.scoop.co.nz/stories/WO0501/S00148.htm>
- 69 See Canada-China Statement on Energy Cooperation in the 21st Century, 20 January 2005, at <http://www.news.gc.ca/cfmx/CCP/view/en/index.cfm?articleid=122289>.
- 70 <http://media.163.com/05/0120/14/1AHVUMR0001417TO.html>
- 71 Gary Park, 'China Confuses Canada', 7 November 2004. Available at: www.petroleumnews.com/pntruncate/976669376.shtml
- 72 http://www.pinr.com/report.php?ac=view_report&report_id=319&language_id=1
- 73 Anup Jayaram, 'ONGC Videsh faces a Chinese challenge in its global search for equity oil'. Available at: <http://www.businessworldindia.com/aug1604/indepth02.asp>
- 74 Interfax website news: Feature: 'Tensions mount over gas reserves in East China Sea'. Available at: www.nautilus.org/napsnet/dr/0407/JUL2904.html
- 75 Human Rights Watch publication and other news: www.hrw.org/reports/2003/sudan1103/26.htm#_ftn1397; www.afrol.com/articles/13921
- 76 China's Timber Imports Raise Concerns. www.cifar.cgia.org/docs/_ref/publications/newsonline/35/china_timber.htm and <http://www.washingtonpost.com/wp-dyn/content/article/2007/03/31/AR2007033101287.html>
- 77 <http://www.ifc.org/ifcext/media.nsf/content/SelectedPressRelease?OpenDocument&UNID=7A58C4C5AF8DDAB4852570B20056213A>
- 78 <http://www.newscientist.com/article/mg16922802.100-logging-ban-backfires.html>
- 79 <http://www.newsday.com/news/opinion/ny-vpts0815,0,3892931.story?coll=ny-opinion-headlines>
- 80 http://www.forbes.com/2006/10/06/energy-oil-ethanol-biz-energy_cx_pm_1009overview_energy06.html, http://www.chinadaily.com.cn/bizchina/2007-01/13/content_782792.htm, http://www.chinadaily.com.cn/english/doc/2004-08/26/content_368820.htm
- 81 APERC, 2002, p. 153.
- 82 <http://www.chinanews.cn/news/2004/2005-02-04/1566.shtml>
- 83 <http://www.chinanews.cn/news/2004/2005-03-30/2933.shtml>
- 84 China statistical yearbook 2005, p. 255; China statistical yearbook 1993, p. 477.
- 85 'Chinese companies abroad', Special Report, *The Economist*, 2 July 2005, p. 69.
- 86 http://www.pinr.com/report.php?ac=view_printable&report_id=272&language_id=1
- 87 Tenth Five-Year Plan for National Economic and Social Development. Available at: <http://www.people.com.cn/GB/shizheng/16/20010318/419582.html>
- 88 http://iwaas.cass.cn/en/others/show_fruit.asp?id=166
- 89 <http://www.iags.org/china.htm>
- 90 <http://news.bbc.co.uk/1/hi/business/4738939.stm>
- 91 http://news.xinhuanet.com/english/2005-08/04/content_3306955.htm
- 92 'Indian team to visit China for oil talks', *China Daily*, 6 August 2005. Available at: http://www.chinadaily.com.cn/english/doc/2005-08/06/content_466875.htm
- 93 'Joint energy move to benefit India', *China Daily*, 26

- August 2005. Available at: http://www.chinadaily.com.cn/english/doc/2005-08/26/content_472513.htm
- 94 http://www.chinadaily.com.cn/china/2006-06/11/content_613810.htm
 - 95 http://english.people.com.cn/200702/23/eng20070223_351994.html
 - 96 http://www.chinadaily.com.cn/english/doc/2004-09/04/content_371641.htm
 - 97 http://www.greencarcongress.com/2006/08/china_targeting.html
 - 98 <http://au.biz.yahoo.com/050413/33/42us.html>
 - 99 Sun Wensheng et al, 2001, p. 8.
 - 100 'China to Make Use of Foreign Mineral Resources'. Available at: http://english.people.com.cn/english/200106/12/eng20010612_72458.html
 - 101 Li Kegang et al., 'Application of MAPGIS in the Planning of Minerals'. Available at: <http://www.paper.edu.cn/scholar/download.jsp?file=xujiang-1>
 - 102 Hu Jingyan and Wang Xiaohong, 'Broaden investment horizons', *China Daily*, 1 August 2005.
 - 103 For example, in September, Zhuzhou Smelting, China's second-largest zinc producer by capacity, publicly declared that they were looking to acquire mines at home and abroad to tackle a shortage of raw materials. See http://www.chinadaily.com.cn/english/doc/2005-09/17/content_478676.htm for further details.
 - 104 <http://www.bloomberg.com/apps/news?pid=20601012&sid=aB9g3q33wqvc&refer=commodities>
 - 105 http://news.xinhuanet.com/english/2006-12/30/content_5549052.htm
 - 106 Trinh and Voss, 2006. Available at: <http://www.dajun.com.cn/hunger.htm>
 - 107 <http://www.sais-jhu.edu/pubaffairs/publications/saisphere/winter06/lewis.html>
 - 108 Zhu Chunquan et al., 2004, p. viii. Available at: <http://www.wfchina.org/sl/download/Chinawood.pdf>
 - 109 FAO, 2003, Chapter 3, p. 189.
 - 110 Trinh and Voss, 2006. Available at: <http://www.dajun.com.cn/hunger.htm>
 - 111 China's ability to feed itself has been a matter of intense debate in recent years. Following China's substantial imports in 1995, Lester Brown in his book, *Who will feed China?*, predicted alarmingly high rate of growth in food imports of up to 200 million to 370 million tonnes by 2030, associated with higher rates of Chinese per capita consumption, with adverse effects on the low income food import-dependent countries, particularly in Africa (Lester Brown). Brown's predictions have been refuted by virtually every analyst of the global food situation (Alexandratos 1996 and 1997; Paarlberg 1997; Rozelle and Rosegrant 1997; Pinstrup-Andersen, Pandya-Lorch, and Rosegrant, 1997; World Bank 1997.) and the Government of China (Information Office of the State Council of the People's Republic of China 1996).
 - However, the Brown projections did help focus the attention of the Government of China, the World Bank and others to more critically examine the food security prospects of China. Some analysts have forecasted that China will become a major food exporter (Chen and Buckwell 1991, Mei, 1995). A few others have predicted that China will become a major importer (Garnaut and Ma 1992, Carter and Funing 1991, Brown 1995). The World Bank has projected demand for food grains to rise to almost 697 million tonnes of trade grain, 608 million tonnes of milled grain equivalent including 206 million tonnes of feed grain in 2020. The World Bank argues that, *provided China invests sufficiently in agriculture*, it will be able to supply most of its domestic food needs with likely increases in food imports to the tune of between 30 million tonnes to 90 million tonnes by 2020.
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 - 115 FAO, 2003, Chapter 3, p. 71.
 - 116 Sources: <http://www.xslx.com/htm/szrp/rdtw/2004-09-03-17232.htm>; Lizi, Hungry for Answers, [http://www.bjreview.com.cn/200441/Cover-200441\(A\).htm](http://www.bjreview.com.cn/200441/Cover-200441(A).htm); Xiaoguang Kang, grain supply strategy in global village age-- China's grain international trade and safety, Tianjin People's publication, 1998, p. 11; and, Brown, 1995, <http://desip.igc.org/BrownFeedChina.html>.
 - 117 Jikun Huang, *Management World*, 2004, vol. 3, pp. 95-104. Available at: http://www.usc.cuhk.edu.hk/wk_wzdetails.asp?id=3570
 - 118 Elton Robinson, 'China tells USGC of intent to become corn net importer', 11 May 2005, Farm Press Editorial Staff. Available at: <http://southeastfarmpress.com/news/051105-China-grain/index.html>
 - 119 Jikun Huang, *Management World*, 2004, vol. 3, pp. 95-104. Available at: http://www.usc.cuhk.edu.hk/wk_wzdetails.asp?id=3570
 - 120 Jikun Huang, *Management World*, 2004, vol. 3, pp. 95-104. Available at: http://www.usc.cuhk.edu.hk/wk_wzdetails.asp?id=3570
 - 121 http://www.businessweek.com/magazine/content/04_40/b3902074.htm; <http://www.brazzilmag.com/content/view/1237/49/>
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 - 125 'Chinese Entrepreneurs Ready to Invest in African

- Farming Sector', Xinhua News Agency. Available at: http://english.people.com.cn/200209/28/eng20020928_104063.shtml
- 126 <http://www.chinanews.com.cn/news/2004/2004-12-30/26/522893.shtml>
- 127 Trinh and Voss 2006. Available at: <http://www.dajun.com.cn/hunger.htm>
- 128 http://english.gov.cn/official/2006-03/14/content_227248.htm
- 129 <http://www.ibsa-trilateral.org/index.html#>; <http://www.boaforum.org>; <http://www.g77.org>; <http://www.g24.org>.
- 130 http://www.chinaep.com/eng/cppolicystrategy/circular_economy.html
- 131 See the WWF report, *Indian Companies in the 21st Century*, for an example of a basic structure for defining between different kinds of effects. The report is available at www.panda.org/trade.
- 132 http://english.sepa.gov.cn/zwxx/xwfb/200612/t20061211_97183.htm
- 133 www.stockholm.se/upload/För%20företagare/upphandling/Handla%20smart/pdf/Totalkostnad_eng.pdf
- 134 For concrete examples see 'Arab companies in the 21st Century', available at www.panda.org/trade.
- 135 See for example NEF's work for inspiration <http://www.happyplanetindex.org/introduction.htm>
- 136 'China accounts for an estimated 12 % of global sales, dominating a significant share of the global luxury market when compared with Japan, 41%, the United States, 17%; and the European countries, 16%. By 2010, China is expected to have a quarter-billion consumers who can afford luxury products, nearly 17 times the present number. By 2015, Chinese consumers could account for 29%10 of all global luxury goods purchases.' Ernst & Young, China: The New Lap of Luxury, 2005,. Available at: [http://www.ey.com/global/download.nsf/China_E/050914_Report_E/\\$file/China-The%20New%20Lap%20of%20Luxury_Eng%20\(Final\).pdf](http://www.ey.com/global/download.nsf/China_E/050914_Report_E/$file/China-The%20New%20Lap%20of%20Luxury_Eng%20(Final).pdf)
- 137 See chapter 6.1 'A Sino-Arab axis for global sustainability', in *Arab Companies in the 21st Century* and chapter 5.1 'A BRICS axis for sustainable development', in *Indian Companies in the 21st Century*, both available at www.panda.org/trade.
- 138 See www.panda.org/ict for more examples.
- 139 This quote is from Jacques Diouf, Director-General of the UN Food and Agriculture Organization (FAO), March 2003, he explains virtual water and why it is important: 'In short, to revolutionise agricultural water management we have to move beyond purely technical solutions. Agriculture has to shoulder a much broader responsibility in its water use, which includes protecting human health and the environment. Global action with appropriate funding mechanisms should link global goals with local initiatives and local needs, particularly for poor farmers and vulnerable groups. While international partnerships and private sector involvement through financial support, technical assistance and capacity building should be fostered, water-scarce countries could import basic foods such as cereals from water-surplus areas ("virtual water") and use their own limited water resources to grow high value crops, such as fruits, vegetables and flowers. The foreign exchange they earn from this could then be used to buy cereal imports.'
- 140 <http://www.undp.org/globalpublicgoods/>
- 141 In this Policy it is stated for example that: "Restricting the exploitation of mineral resources that produce considerable negative impacts on the ecological environment. Strict control will be enforced on prospecting and exploitation in national conservation and other areas where the ecological conditions are weak. Mineral resources exploitation is forbidden in national conservation, important scenic areas and important geological protection areas, and mineral resources exploitation in ecological protection areas is strictly restricted. We shall strictly prohibit coking, metal refining and smelting, sulfur and vanadium refineries with indigenous methods. We shall restrict the building or rebuilding of mines producing coal with a sulfur content exceeding 1.5%, and prohibit the building of mines producing coal with a sulfur content exceeding 3%. We shall restrict the exploitation of mineral resources in areas liable to geological disasters, and prohibit the exploitation of mineral resources in areas with real danger from geological disasters. Unauthorized exploitation of mineral resources within a given distance on both sides of railway lines and major highways is forbidden." http://english.gov.cn/official/2005-07/28/content_17963.htm
- 142 For China's previous years' investments in overseas oil and gas sectors, please see the Rand report: *China's Quest for Energy Security* at: <http://www.rand.org/publications/MR/MR1244/>

- a b http://www.chinadaily.com.cn/bizchina/2006-09/09/content_685208.htm
- c http://en.ndrc.gov.cn/hot/t20060529_71334.htm
- d While China is a large country the per capita resources of China is relatively small. When Chinese experts worked with China's Agenda 21 work they estimated that in 1989 the per capita fresh water, cultivated land, forest and grassland of China comprised 28.1%, 32.3%, 14.3% and 32.3% of the world's average, respectively. But not only that, they also stated that the per capita resources figures and ecological quality where either declining or deteriorating. The high population density has resulted in a situation where China is already overshooting its biological capacity. On top of this comes the need for products that China export.
- http://www.footprintnetwork.org/gfn_sub.php?content=footprint_china
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- http://www.footprintnetwork.org/gfn_sub.php?content=footprint_china
- f See for example: World Investment Report 2005 and <http://www.millenniumassessment.org/en/Products.Global.Scenarios.aspx>
- g See for example: http://www.panda.org/news_facts/publications/key_publications/living_planet_report/index.cfm
- h See for example
- i See for example China in the world Economy by Hong SONG and chapter two in the full version of the report.
- j http://english.people.com.cn/200409/20/eng20040920_157654.html
- k http://www.economist.com/business/displaystory.cfm?story_id=4352026
- l <http://www.un.org/ecosocdev/geninfo/afrec/vol18no1/181asia.htm>
- m <http://news.bbc.co.uk/1/hi/business/5360890.stm>
- n http://www.cafod.org.uk/policy_and_analysis/rough_guides/transparency
- o <http://www.idrc.ca/plaw/>
- p http://www.iadb.org/laeba/downloads/WP_28_2004.pdf
- q www.globalwitness.org/about_us/downloads/ANNUAL%20REPORT.pdf
- r Walden Bello, China Provokes Debate in Africa, <http://www.fpif.org/fpiftxt/4065> and David Zweig & Bi Jianhai China's Global Hunt for Energy, <http://www.foreignaffairs.org/20050901faessay84503/david-zweig-bi-jianhai/china-s-global-hunt-for-energy.html>
- s See for example Richard Layards book "Happiness" and especially the chapter "The National Income: A sorry tale" page 133-147, R. Easterlin in his book "Growth Triumph" captures his well: "Economic growth is indeed triumphant, but to no point. For material prosperity does not make humans happier: the "triumph of economic growth is not a triumph of humanity over material wants; rather, it is the triumph of material wants over humanity".
- t http://english.people.com.cn/200603/08/eng20060308_248947.html
- u For a discussion about the definition of Chinese outward investment see 2.1
- v China Economist, March 2006, "China under resource & environmental constraints", page 11-23
- w siteresources.worldbank.org/INTEAPINFRASTRUCT/Resources/855084-1137106254308/ResourceRequirements.pdf
- x <http://www.millenniumassessment.org/en/Products.BoardStatement.aspx>
- y See for example African Business July 2006, no 322, Theme: "Chinas march into Africa"
- z http://english.gov.cn/official/2006-03/14/content_227248.htm
- aa <http://www.ibsa-trilateral.org/index.html#>
- <http://www.boaoforum.org>
- <http://www.g77.org/>
- <http://www.g24.org>
- ab http://www.chinaacp.com/eng/cppolicystrategy/circular_economy.html
- ac See the WWF report Indian Companies in the 21st Century for an example of a basic structure for define between different kinds of effects. The report is available at www.panda.org/trade.
- ad http://english.sepa.gov.cn/zwx/xwfb/200612/t20061211_97183.htm
- ae For concrete examples see "Arab companies in the 21st Century" available at www.panda.org/trade
- af "China accounts for an estimated 12% of global sales, dominating a significant share of the global luxury market when compared with Japan, 41%, the United States., 17%; and the European countries, 16%. By 2010, China is expected to have a quarter-billion consumers who can afford luxury products, nearly 17 times the present number. By 2015, Chinese consumers could account for 29%10 of all global luxury goods purchases." Ernst & Young, China: The New Lap of Luxury, 2005, [http://www.ey.com/global/download.nsf/China_E/050914_Report_E/\\$file/China-The%20New%20Lap%](http://www.ey.com/global/download.nsf/China_E/050914_Report_E/$file/China-The%20New%20Lap%20)

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ah This quote from Jacques Diouf, Director-General of the UN Food and Agriculture Organization (FAO), March 2003 explain virtual water and why it is important: “In short, to revolutionise agricultural water management we have to move beyond purely technical solutions. Agriculture has to shoulder a much broader responsibility in its water use, which includes protecting human health and the environment. Global action with appropriate funding mechanisms should link global goals with local initiatives and local needs, particularly for poor farmers and vulnerable groups. While international partnerships and private sector involvement through financial support, technical assistance and capacity building should be fostered, water-scarce countries could import basic foods such as cereals from water-surplus areas (“virtual water”) and use their own limited water resources to grow high value crops, such as fruits, vegetables and flowers. The foreign exchange they earn from this could then be used to buy cereal imports.”

ai <http://www.undp.org/globalpubl>



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