# CHINA'S INCREASING ECONOMY AND THE IMPACTS ON ITS ENERGY STRATEGY

JOSÉ ROBERTO CONCHA VELÁSQUEZ*
Ph.D. in Business, Tulane University, United States.
Marketing Department Director, Universidad Icesi, Colombia.
Research group "Competitividad y productividad en las organizaciones", affiliated to Universidad Icesi, Colciencias B classification.
jrconcha@icesi.edu.co

BERNHARD PICHLER
Magister deer Sozial, Johannes Kepler University, Austria.
Bernhard-Pichler@gmx.at

Fecha de recepción: 23-03-2010 Fecha de corrección: 30-09-2010 Fecha de aceptación: 11-10-2010

## ABSTRACT

This work enters into the topic of one of the world's most increasing economy, the economy of China. It will treat the question, how a country, hence a political system which was such closed and had a quite small economical standard and growth rate was able to improve in a tremendous way. This present fact discovers various questions, such like: How is it possible that a closed socialist state can improve its economical increase and international trade in a tremendous way? How is an increase in trade and production combined with energy consumption? How can China secure its energy sources in order to secure its production and energy household? The document starts with the theory of free trade to step into that topic.

## KEYWORDS

Energy consumption, socialist market economy, natural resources, global economy.

**JEL Classification:** O53, N75, P28

* Autor para correspondencia. Dirigir correspondencia a: Universidad Icesi, Calle 18, No. 122-135, Pance, Colombia.

## RESUMEN

***Crecimiento de la economía China y su impacto en su estrategia energética***

El presente artículo aborda el tema de una de las economías de mayor crecimiento, la economía de China. Se analiza el tema de cómo un país y, por consiguiente, un sistema político que anteriormente era tan cerrado y tenía un nivel económico y un índice de crecimiento tan bajos pudo lograr un crecimiento tan notable. Esta realidad suscita ciertos interrogantes tales como los siguientes: ¿Cómo pudo un estado socialista cerrado mejorar su crecimiento económico y su comercio internacional de una manera tan extraordinaria? ¿Cómo se relaciona el incremento en el comercio y la producción con el consumo de energía?¿Cómo puede China garantizar las fuentes de energía necesarias para su producción y su consumo energético nacional? El trabajo empieza con la teoría de libre comercio antes de abordar estos temas.



## PALABRAS CLAVE

Consumo de energía, economía de mercado socialista, recursos naturales, economía global.



## RESUMO

***Economia crescente na China e os impactos sobre sua estratégia energética***

Este trabalho entra no tópico de uma das economias com maior crescimento do mundo, a economia da China. Ele irá tratar da questão de como um país, anteriormente um sistema político com um padrão econômico e uma taxa de crescimento econômico bastante pequenos, conseguiu melhorar de forma tão extraordinária. Este fato atual revela várias questões, tais como: Como é possível que um estado socialista fechado possa melhorar o seu crescimento econômico e de comércio internacional de uma forma tão extraordinária? Como é um aumento no comércio e produção combinado com o consumo de energia? Como pode a China proteger suas fontes de energia, a fim de garantir sua produção e utilização de energia doméstica? O trabalho começa com a teoria do livre comércio para entrar nesse tópico.



## PALAVRAS CHAVE

Consumo de energia, economia socialista de mercado, recursos naturais, economia global.

## INTRODUCTION

China's economic reform policy led to strong economic growth of the country. However, the positive effects of the enormous growth have also resulted in an extreme increase in China's consumption of energy. Certainly, China is an enormous energy producer; however, it needs the whole of its extracted energy for its own requirements. To the fact is that China's rising energy production can hardly keep up with the rising consumption.

Especially in the country's ever increasing oil demand, China consumes more then it extracts. To date, China's energy import dependency already amounts 50% of its total consumed energy, according to some sources, even 60% or higher.

This leads to the thesis that China's rising crude oil demand forces China to enter new import alliances with alternative regions respectively spheres of influence. How far this goes and in what reactions these relations result by industrial countries is described in the present work.

This work describes China's economic reform and analyzes the rising needs of its energy demand. At the core of the work is the examination of China's future strategy to guaranty its required energy reserves.

The theoretical border, therefore, is the so-called *Limits of Growth* theory (Simmons, 2000). When this theory is applied to China's increasing energy demands two conclusions can be drawn:

- First, since crude oil as well as other fossil fuels is not an unlimited raw material, old established economic powers on the global market have already divided the world's supply of oil and fossil fuels amongst themselves. However, economic growth is restricted by resource energy. To secure its future energy resources China must, as a young economic power, follow alternative strategies and come to new arrangements on the global market.
- Second, on account of increasing resource shortages and simultaneous economic growth, an exponential increase of competition of resource access is to be expected. This spiral of ever-increasing competition in the energy market arises on account of the rising demand and diminishing supply. China in this connection is not only the country with the world-wide highest number of inhabitants, but also with the fastest economic growth and the largest increase of energy consumption. China thus strongly affects the world-wide oil market, more specifically the contest around resources and price formation.

This document analyzes China's economic growth on the basis of the classical free trade theory, and describes its energy demand growth, as well as its energy system. It also discusses the energy resources issue in combination with the limits of growth theory and, based on this background, looks at China's international energy security strategy.

## 1. THE ENERGY CONSUMPTION IN THE CHINA PROCESS

Energy supplies have had a decisive significance for economical activities.

The ample availability of cost-effective fossil fuels influenced substantial rapid growth of the world economy in the last few decades. The most important source of energy is oil, consisting of one third of total energy consumption, followed by coal and natural gas (Greiner, 2001).

Various factors influenced the energy consumption; one part among others is the international trade. Countries like China (but also India) will be the strongest energy consumers in the future (Bund, 2001).

Due to the fact that China's economy and trade is strongly increasing that point breeds various consequences for China but also for the international energy market, which are substance of the ongoing paper work.

China was formerly a closed market under a communist regime, however it commenced in the late 1970's a liberalization policy (Reisach, 2007). One part of the reform process was political reforms. Those reforms were necessary to realize economical reforms too. The political reform was implemented by small but important reform steps: such like ownership of private poverty, increase of foreign direct investments, freedom of religion, etc. (Fanchen, 2005; Woyke, 2005). Today, China sees itself as a *Socialist Market Economy* that means a liberal and opens market but a socialist government (Reisach, 2007).

Another main part of the reform process was the economical reforms. The country opened its market step by step and turned its production strategy from quantity to quality. With its new liberal-socialist face, the country achieved dramatic economic growth (Cho, 2005). The reform process had some important steps, such like:

- The opening of the borders for foreign investors (Zinzius, 2006)
- The straightening of market-economy interests in the national economy during the years (Bardosch, 2004)
- One of China's main steps in its liberalization policy was the accession to the World Trade Organization in December 2001, which gave, and will still give, China's economy a tremendous boost, but also various future challenges as well as options (Rumbaugh and Blancher, 2004)

The results of the market liberalization are an improved market access. Hence, today China is among the most important export destinations (Rumbaugh and Blancher, 2004). China became one of the fastest economically growing nations and is meanwhile the fourth largest economy in the world. Many investments are settled by foreign nations and companies, the same way also advanced technology is delivered to China. Even during the economic crisis China had a strong economic growth (Démurger, 2000; Embassy of the People's Republic of China in the United States of America, 2006; Yunlong, 2008).

## 2. CHINA'S ENERGY DEMAND

As a country with strong economic growth, China needs an increasing share of the world's energy- and natural resources. Its consumption of energy mix is split to: 65% coal, 25% oil, 7% hydroelectricity, and 3% gas and nuclear power.

So, China's most important energy is coal which covers nearly two third of its energy demand. This country is the world's largest producer but at the same time also consumer of coal (Energy Information Administration EIA, 2006).

China's second largest energy source is oil. At the same time China is the world's second largest consumer of oil with an enormous annual growth rate of 12%. The problem here is that its import dependency rate already reached nearly 50% (International Energy Agency IEA, 2007a; Pöllath, 2007).

A further important energy for China is hydroelectricity: even in that sector China is the world's second largest producer since 2004, only Canada has a higher production rate. But also here the production as well as the consumption is expected to rise (Energy Information Administration EIA, 2006). Although, China has the world highest capacity for hydroelectric power stations its electricity generation continues to be dominated by fossil fuel sources (Energy Information Administration EIA, 2006). China's smallest energy source is nuclear power, however also that sector is planned to increase (Cole, 2003; Pöllath, 2007).

China's coal mines and oil fields are mainly state owned, just the same way like their energy and electricity umbrella organizations. That fact offers China the ability to attract greater investment and new coal technologies as well as a more effective fuel extraction. However, in spite of many improvements China's energy efficiency is still very low (Energy Information Administration EIA, 2006; Lichtenecker, 2006).

## 3. THE RESOURCES SUPPLY MATTER

For the strategic planning of a state energy household one question is essential: for how long will natural resources be available? Hence, that topic affects very strongly China's energy strategy.

For this question, in resources supply different aspects exist:

- The limits of growth theory, and
- Sufficient global resources are available (due to increasing global discoveries)

The so called Limits of Growth theory, established by the Club of Rome, says that the exhaustion of our global fossil fuels is the limit of growth of our current economic system and that scenario could happen probably within the next one hundred years, hence an uncontrolled economic decline follows (Simmons, 2000).

The controversial theory, which says that sufficient global resources exist due to alleged increase of oil discoveries, concludes that there is no risk of probably future energy shortages (United States Geological Survey, 2000). Generally on basis of international statistics can be said that new oil discoveries are still made but the amount of new findings is decreasing (Leggett, 2005). An interesting fact is that reserve statistics are increasing anyway. Critics mention in that connection that the rise of reserves is only published by oil exporting countries to boost the export quota but actually if one would add the new discoveries to the old reserves then

the total amount on reserves might show decreasing numbers (Leggett, 2005).

Other calculations, however, come to other results: if one takes the world scale of new discoveries, where the peak was reached in 1964, include all following findings and distinguish the consumption respectively anticipate future consumption, one calculates with a global production peak between 2010 and 2020 (Manning, 2000).

This scenario is a preview of the Limits of Growth theory, with all its consequences. For explanation: a world scale of production peak means that one half of the available oil has been consumed. The result of that prognosis is that the production of natural resources would decline and prices would rise (Manning, 2000).

## 4. GENERAL MEASURES TO REACH ENERGY SECURITY

Generally can be stated that for energy importing countries two factors are essential in that connection:

- The energy security which means sufficient energy supply, and,
- Price efficiency which means low energy costs by liberalization of the domestic market (Greiner, 2001).

Various measures are possible to reach energy security, China applies all of them:

- Maximization of production: China's oil production is already at its peak (Pöllath, 2007)
- Stockpiling of oil, what helps to prevent price fluctuations or supply bottlenecks (AFP, 2005)
- Erection of oil-multinational companies to reach market power (Pöllath, 2007)
- Restriction of consumption (International Energy Agency IEA, 2007a)
- The establishing of alternative energy sources (International Energy Agency IEA, 2007a)
- An improvement of the infrastructure (Xu, 2002)
- Diversification of international suppliers, that point is China's main tactic. (Hurst, 2007)

In that connection China tries to secure access to oil in adequate amounts through the widespread diversification of its oil supplying countries and thereby ensuring future economic growth. China's international energy policy is only possible in combination with a like-minded foreign policy. Therefore, one of China's core political positions is sovereignty of each state as a peaceful international body. That makes China an attractive partner for countries which are economically dependent or suppressed by western industrial states or international institutions like for example the World Bank or the IMF (Pöllath, 2007).

The problem hereby is that only a few areas in the world can be considered 'underdeveloped' in terms of oil and gas exploration, hence: China has paid extraordinarily high prices for shares in oil development contracts. Since the middle of the 1990's, Chinese oil companies have quadrupled their oil imports and diversified their supply sources (Gu and Mayer, 2007; Kambara and Howe, 2007).

China's largest source of energy is the middle east. In that region the most important suppliers are: Saudi Arabia, Iran, and Oman. China's dependency in the Middle East is increasing steadily. Though, China makes huge efforts not to be dependent on any one region (Daojiong, 2005; Energy Information Administration EIA, 2006; Gu and Mayer, 2007).

The disadvantage for China in that connection is that China's good trade relations with so called 'rogue countries' like Iran or the Sudan, which import benefits in weapon and weapon technology, stretches the relation with western industrial countries such like the US.

The second place in China's supplying regions takes Africa as a whole: African deliveries hold 30% of China's oil supply with an up warding tendency. By supporting Africa, China achieves two main economic goals; first it gains new markets for its exporting industry and second, China can acquire as much energy and raw materials as it needs. Most expert analysis believe that China's massive resource and energy gains have been the key economic drive for China's engagement in Africa (Davies, 2006; Gu and Mayer, 2007).

Also Central Asia is an important energy market for China. In Central Asia there are various oil producers; the most important is Kazakhstan and to some degree Turkmenistan and Azerbaijan. These countries deliver both oil and natural gas, with most of the oil reserves being located in the Caspian Sea. Between 1993 and 1995 nearly two thirds of China's oil imports came from the Asia-Pacific region (Gu and Kupfer, 2006; Pöllath, 2007).

The situation with Russia is similar. Russian oil fields need capital and technology to stabilize their production. Therefore the two countries can mutually benefit one another; Russia has the oil to provide China - and China has the capital to improve parts of the Russian infrastructure (Hurst, 2007).

Furthermore China has several bilateral trade agreements with different Latin-American states. The Latin American market only represents a very small share of China's total global trade; nevertheless, Chinese-Latin American trade relations have been growing rapidly (Eisenman, 2007).

China's most important trading partner in that region is Venezuela, which is the world's fifth largest oil exporter and exports approximately 60 percent of its oil into the USA. Venezuela's President Hugo Chavez has signed various agreements with China, which assure a strong increase of oil exports. Other trading partners in Latin America are also Mexico, Brazil and Argentina (Gu and Mayer, 2007; Hurst, 2007).

On the global aspect China's relations with the US are also very significant. China's former leader Mao Zedong felt that countries between the two leading countries USA and UDSSR were independent and should band together to form a united front against imperialist America. This zone was broken into sections and the developing countries of Asia, Latin America, and Africa were placed at the forefront of a struggle against imperialism. In that connection

China supported various countries or guerrilla movements (Mitchell. and McGiffert; in Eisenman, 2007).

Since 2000 the relationship with the USA steadily improved. However, all differences have not been removed and mistrust still exists. One of the US's main problems with China is China's growing resource demands and alliances with geopolitical consequences (Riemer, 2005).

Nevertheless, China has still clear interest in good relations with the USA but at the same time also with the Middle East (Yufeng; in Eisenman, 2007). But also China's interests in oil producing countries of Latin America causes conflicting interests with the USA, which is for example the main customer of Venezuela's oil.

Another global strongly economically increasing country is India. China and India had similar development strategies. India has been moving step by step with China in its pursuit of oil. In the current situation, China and India are the two countries developing the greatest thirst for oil. That makes both countries equally dependent on oil from abroad. Both countries realized that the best way to tap into equity oil is to focus on the oilfields of relatively crisis-ridden countries (Hurst, 2007; Riemer, 2005).

China is also investing in Canadian oil production. Since 1998 Canada has been the largest foreign supplier of oil to the US. The fact that China also stepped into that market causes displeasure of the US (Hurst, 2007).

China had even rights for various oil fields in Iraq: the US invasion in Iraq hit China hard, especially since the new implemented interim government pronounced contracts from the Saddam Hussein era as invalid; hence China lost its Iraqi developing rights (Kneissl, 2006).

### *International implications*

China's increasing demand for oil is strongly influencing world commodity prices and markets and driving oil prices up to dramatic levels. Since China is the world's second largest energy consumer, its energy policy will have lasting effects on the global energy market (Hurst, 2007; Riemer, 2005).

The actual so called *oil age* is described as an epic battle for power and resources, which means China has to continue its strategy of acquiring oil contingents on the global market. Even the economic crisis had only small effects on China's oil demand, since China's economy is still increasing and at least its huge population dictates a huge demand (Gu and Mayer, 2007; Wang, 2009).

### *Possible options for the future*

China has a rich potential for alternative fuels and energies, such like solar, wind, and tidal energy, but also modern bio-fuels are a potential option (International Energy Agency IEA, 2006).

China should seek stronger relations amongst international market players which are valuable in delivering efficiency to institutional and large commercial markets and especially useful to improve energy use efficiency. That includes more transparency of its resources policy as well as an international reliable policy (International Energy Agency IEA, 2006; Umbach, 2007).

Even a controlled slowing down of China's economic growth may help if Beijing does not interact in its economic growth in a controlled manner, probably various bottlenecks in the energy supply system, as well as environmental problems will probably force a slow–down in its economic growth in a less-controlled manner (Khan, 2008; Shealy and Dorian, 2007).

## 5. DISCUSSION

China, a former closed market under a communist regime, commenced in the late 1970's a total economic liberalization policy. The country opened its market step by step and turned its production strategy from quantity to quality. With its new liberal-socialist face, the county achieved dramatic economic growth. According to this pattern, various former closed economies have liberalized their markets and were also able to reach similar growth rates; however, on account of its growth speed and its world's highest population denseness, China's economic growth rates have sustainable influence on the global economy. One of China's main steps in its liberalization policy was the accession to the World Trade Organization in 2001, which gave, and will still give, China's economy a tremendous boost, but also various future challenges as well as options.

Coupled with China's economic growth, its energy demand and consumption has recorded a significant increase. China has the fastest growing energy demand in the world and is the world's second largest energy consumer, which immediately affects the global price for crude oil. While China is able to cover most energy demands by domestic resources, especially the main part of its most important resource coal, it is not provided with adequate oil resources and became an oil importing country in 2003.

However, due to China's ever increasing economy and it's consequently increasing energy consumption it became a net coal importer in 2007 also. For the Chinese government an everlasting increasing economy and consequently improvement of the populations living conditions is eminent since the satisfaction of the public expectations ensures the continuance of its political legitimacy.

Next to China's main energy resources coal as well as followed by far from crude oil, it uses other resources with a lower importance like hydroelectric, natural gas, nuclear power and other partly renewable power resources also.

Three main points are determining to China's domestic oil demand:

- Its economic growth rate
- Its transport and automobile policy
- The grade of development and implementation of new technologies, such as hybrid technology and fuel cells in the transport sector or coal liquefaction, hydro or wind power etc. The more China is able to implement new technologies, the less natural resources will it be consuming.

The main issue in this context is that China's main energy demand bears on fossil fuels like coal and oil, hence on non-renewable natural resources. It is true that scientists prognoses dif-

ferent scenarios concerning the use up of fossil fuels. Though, shortness in oil production respectively a discontinuing of natural fossil resources can be estimated most probably for the near future somewhere in the middle of the present century, therefore the global race for energy resources becomes stronger more and more. In that connection some scientists estimate a global production peak of natural oil resources within the next eleven years; afterwards the production rate is prognosticated to decline whereas the demand would still increase. That situation forces fundamental strategies to secure the availability of needed energy resources, especially for countries like China which has quadrupled its oil imports since the middle of the 1990's.

The traditional aims in energy policy of energy importing countries are energy security in terms of risk reduction of a possible interruption of its energy importations and price efficiency of energy supply. To secure its oil supply China invests in various measures, such as strategic stockpiling of oil reserves to prevent price fluctuations, the erection of oil-multinationals to reach market efficiency and bargaining power, alternative energy sources to decrease the consumption of natural resources, advanced infrastructure to secure cost efficiency, and diversification of international suppliers.

Further energy security measures which are rather not expectable to become stretched out in China are an additional maximization of production since the current production already became enlarged to its maximum and a restriction of consumption while China's demand is continuously growing, China's main strategy to tap into equity oil is a spread diversification of its oil supplying countries with focus on oilfields of crisis-ridden countries, which are partly avoided by the West. China opines the philosophy that each state has its own sovereignty as a peaceful international body. This strategy has led the Chinese government to pursue close diplomatic ties with countries that pursue questionable domestic policies and in many cases foreign policies in defiance of American and European interests and/or preferences. That explains why China interacts with so called *rogue* countries, such as Sudan or Iran. Other important oil suppliers for China are amongst others Saudi Arabia, Angola, Russia or Oman. Generally can be said that the Middle East presents China's most important supplier region, followed by Asia. But also Africa plays an important role as supplier as well as in China's long term energy strategy, that's why the Beijing pumps massive investments in the development of countries such as Angola, Congo or Nigeria.

Further less important regions for China in that connection is Latin America. By picking up equity in oilfields around the world, China ensures its economical and reliable oil supplies. By acquiring stakes in foreign oilfields respectively sharing development and production costs and/or rights with foreign partners, China cuts its oil purchase cost.

Foreign policy priorities can change in the long run, though, in the short term Beijing seems to have set its priorities. China's international

oil security strategy illustrates its general priority of using its foreign policy philosophy to advance domestic economic goals by diversification of its fossil fuel suppliers. For these partly developing countries China demonstrates a potential alternative consumer to old-established industrial countries.

Altogether, China's foreign policy goal is to befriend everyone, which may not always be attainable. First, some Chinese policies and practices of achieving good relations with partly rogue states have caused tension with US-Chinese relations, which are in a historical connection weak and critical. Secondly, regional conflicts may force China to choose sides between nations. Choosing a position may have unforeseen negative consequences for China, on account of negative reactions of one of the nations or an outside power such as the United States. Third, China's effort to cultivate goodwill and friendship can be undermined by issues such as not respecting human rights.

A further important aspect in an international point of view is that China's increasing demand for oil strongly influences world commodity oil prices and brings them up to high levels. That is not gladly seen from big established economic powers, all the more since the race for the natural resources is increasing and getting harder continuously. Indeed, caused by the economic crises China suffered a slowing down of its economic growth but its energy demand is still increasing and the economic growth prognosis for the future is well.

For China a sustainable development and implementation of alternative and renewable energies should, and already is, a priority aim for economy as well as for environmental aspects. Though, the current consumption of nonrenewable fossil fuels in China is tremendous and strongly increasing, even though the government follows high long term plans to counteract that trend. To reduce the energy consumption a slower, more controlled and sustainable development of its growing economy may help in terms of more eco-friendly production methods. That measure could get combined with alternative and renewable energies such like solar, wind, tidal energy or bio fuels, even bio gas is a better alternative. Further helpful measures are gaining energy efficiency in buildings, transportation or production sector. Those measures have strong potential because China's energy efficiency was decreasing since the last few years. If China will not be able to get its energy policy under control, the increasing demand may result bottlenecks in the near future and consequently cause unpleasant and uncontrolled cuts in its economy and production.

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