

TRANSITION TO SUSTAINABLE DEVELOPMENT IN CHINA | WHAT OPPORTUNITIES EXIST FOR EUROPE?

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| INTRODUCTION

From 1980 to 2012, the Chinese economy grew at a rate of about 9% per year - three times the global average over the same period. This economic performance has lifted a third of the Chinese population out of poverty and enabled another third to join the middle classes (which in China is equivalent to a minimum annual income of $\{11,000\}$ per capita). However, this economic success has had social, political and environmental costs¹.

First of all, social costs, since the rapid economic rise of China has been accompanied by a significant increase in inequalities between rich and poor and between urban and rural areas. Next, political costs, because to maintain social peace and Party rule in a country undergoing profound change (with "mass incidents" rising from 90,000 in 2006 to 180,000 in 2010 - including both peaceful protests and repressed riots), the State budget set aside for internal security has continued to climb above the military spending rates (which grew by 16% per year between 1990 and 2010). And finally, environmental costs, as shown in a study conducted by the World Bank in 2007, placing the cost of air and water pollution on health and the environment at 5.6% of GDP². However, these estimates were somewhat optimistic and furthermore, air, water and soil pollution has continued to grow while at the same time GDP has slowed down. It is therefore likely that with an increase in GDP of 7.5% in 2013, China's growth, in terms of "green GDP"³, could be seen as almost nil. Thus, steering China's economy towards a sustainable model is a political, social, and environmental necessity⁴.

^{1.} Chen Mei-jun, Marjolijn Klaver, Nico Aparicio Torres, Pedro Moreira da Silva, Joan Henrique Leonardo, *The Enviornmental Impact on the Chinese Economy*, Singapore: EMDC, 2007, 19 p.

^{2.} World Bank, *The Cost of Pollution in China: economic estimates of physical damages*, Washington: World Bank, 2007, 151 p.

^{3.} Xu Fengju, Alireza Soleimani Damaneh, Environmental Accounting and GDP in China and India, *Journal on Innovation and Sustainability*, 2013, 4 (2): 31-38.

^{4.} Elle Carberry, Randall S Hancock, Alan S. Beebe, *The China Grentech Report 2012: forced with challenges, China accelerates Greentech growth*, Beijing: China Greentech Initiative, 2012, 199 p.



Indeed, China's primary objective is to perpetuate its political system (and thus affirm its ineradicable difference with "the West"). However, the sustainability of this system depends on its ability to maintain economic growth which is constrained both by the increasing cost of energy⁵ (driven up by China's own needs) and an increase in wages which would increase production costs and reduce productivity. China has no other choice than sustainable development for ensuring the social peace of its citizens who, unable to express their expectations and frustrations democratically, are increasingly sensitive to the respect and enhancement of their quality of life⁶.

China's awareness of the socio-economic importance of sustainable development offers new opportunities for European companies. Indeed Europe, although criticized today, is a pioneer in the field: with over forty years of experience from the first Environmental Action Plan in 1973 to the present day⁷. Some say that this expertise in environmental standards has resulted in deindustrialising the old world and creating a huge trade deficit with emerging countries. They forget that closing the economic gap is a one-off event. In fact, the current economic growth of emerging countries cannot be seen as Europe's dream of "finding" new growth: such growth acquired at the expense of the environment already belongs to the past. Instead, it is likely that Europe's socioenvironmental standards⁸ will be paving the way to a sustainable future for emerging countries. Proof: China's 12th Five-Year Plan (2011-2015) provides no less than €650 billion of investment in sustainable development.

^{5.} Tang Qing and Liu Yujie, "The Study of the Relationships between China's Energy consumption and Economic Development", *IPCSIT*, 2012, vol. 49, 251-256.

^{6.} Jean-Yves Heurtebise, "L'émergence d'une société civile du risque est-elle un danger pour la Chine ?", *Lettre confidentielle Asie21-Futuribles*, 2012, no. 54, pp. 8-9 ; Jean-Yves Heurtebise, "L'environnement comme instrument de "*regime change*": le cas de la Chine", *Lettre confidentielle Asie21-Futuribles*, 2013, no. 59, pp. 13-14.

^{7.} Michiel A. Heldeweg, "Towards Good Environmental Governance in Europe", *European Environmental Law Review*, January 2005, 2-24.

^{8.} Christian Duschene, Alain Mestre, et Philippe Morvannou, *Une politique industrielle bas carbone comme voie de sortie de la crise*, European Social and Economic Committee, September 2011, 36 p.

| STATE OF PLAY OF THE ENERGY SITUATION IN CHINA: CONSTRAINTS AND OPPORTUNITIES

A reminder of Chinese energy policy figures will help to clarify the nature of the issues involved⁹. China is now the largest CO2 emitter in the world (23% of total emissions) as well as the largest energy consumer in the world (21% of world consumption). Its energy consumption grew by 127% between 1990 and 2005. The dependence of its economy on oil has steadily increased: and while it was a net exporter of oil in the early 1990s, it became the world's second importer of crude oil in 2009.

As for its energy mix, 70% of this consumption is based on the use of coal, 19% on oil, 6% on renewables, 3% on gas and 1% on nuclear power. In terms of use per sector, 72% of energy expenditure comes from the industrial sector, 25% from the residential (construction and housing) and transportation sectors and 3% from the agricultural sector. Finally, energy efficiency levels in China remain very low: despite considerable progress, its energy intensity (the ratio of energy consumption to gross domestic product) is still seven times higher than in Eurozone countries¹⁰.

It is in each of these fields that China must act and where Europe and companies based in the Member States can contribute with their technological know-how and managerial skills¹¹.

^{9.} Lawrence Berkeley, National Laboratory, Key China Energy Statistics 2012, June 2012, 68 p.

^{10.} Worldwatch Institute, *Renewable Energy and Energy Efficiency in China: Current Status and Prospects for 2020*, Worldwatch Report 182, October 2010.

^{11.} Martin Joerss, Jonathan R. Woetzel, Haimeng Zhang, China's Green Opportunity, The McKinsey Quaterly, 2009, 9 p.



| Redefining the Energy mix (clean coal, gas, renewable)

China's first target is to reduce the environmental cost of its dependence on coal. First, qualitatively, by adopting "clean coal" technologies, as exemplified by certain advanced models in Europe (including Switzerland and Germany) but where the technology is still largely North American - including the coupling of power generation and storage of CO2 (with the *Boundary Dam* project).

Then, quantitatively, by reducing the share of coal in the total energy mix¹². To achieve this, China is shifting towards a net increase in the share of gas and nuclear power (contributing 24% and 14%, respectively, of energy consumption in Europe). On the one hand, the demand for natural gas may herald a new context in China's relations with Russia (the current Ukrainian crisis has accelerated the signing of a historic agreement in May between *Gazprom* and the *China National Petroleum Corporation*). On the other hand, China is seeking partnerships in the nuclear sector where Europe has a tradition of excellence; even if it faces competition from the entry of new players in Asia (South Korea), Europe's risk management expertise makes it a crucial ally¹³.

With regard to renewable energy in China, from the point of view of consumption (6% of total) and of energy production (20% of total), most of the energy contribution comes from hydroelectric plants. China, which had 200 dams in 1949, now has more than 85,000. However, their construction involves environmental and social costs and generates geopolitical tensions with neighbouring countries (India and Vietnam in particular). Moreover, by 2015 hydropower will already be operating at 85% of its potential.

Therefore, the greatest energy development potential lies in the fields of solar and wind power. In fact, China is the largest producer of solar panels in the world and the main employer in the photovoltaic sector (more than 1.5 million jobs in 2013¹⁴). However, even today, 95% of production is directed towards export. Thus Europe, as a major user of solar power, has valuable skills in the production of solar grade poly-silicon together with installation, storage and transmission grid technologies.

| Supporting the transition towards a tertiary sector energy policy

In Europe, above all, but also in the United States and Japan to a lesser degree, industry's energy consumption accounts for a minority (24% in Europe, 34% in the US and 45% in Japan) compared to the energy devoted to transport and buildings (residential or commercial)¹⁵. The transition from

^{12.} Jenny Lin, China's Energy Security Dilemma, Project 2049 Institute, 12 p.

^{13.} Ortwin Renn, "White Paper on Risk Governance: Toward an Integrative Framework", Geneva: Global Risk Governance International Risk Governance Council, 2008, pp. 3-73.

^{14.} International Renewable Energy Agency, Renewable Energy and Jobs - Annual Review 2014, May 2014, 12 p.

^{15.} Christiano Façanha, Kate Blumberg, and Josh Miller, *Global Transportation Energy and Climate Roadmap: the impact of transportation policies and their potential to reduce oil consumption and greenhouse gas emissions*, Washington: The International Council on Clean Transportation, 2012, 109 p.



a consumption/production-based model typical of a developing country whose economy is based on exports to the consumption-based model of developed countries implies profound changes in China that European companies must clearly identify to better position themselves.

First of all, if only 10% of total energy consumption comes from transport, this figure might change with the exponential growth of the Chinese automotive fleet: the number of cars has quadrupled in ten years and the number of heavy goods vehicles has quadrupled in five years - and this growth is expected to be even greater in the coming decade¹⁶. Europe has a major role to play¹⁷. Indeed, since the 1990s China has followed European consumption standards for cars - therefore European vehicles are ideally positioned since China will have to enact increasingly stricter enforcement standards. Furthermore, the severe air pollution of large cities could speed up the transition towards implementing the development infrastructure for electric cars, while Europe's electric car-sharing experiences could also play a future role in many Chinese cities¹⁸. Finally, the construction of energy-efficient lorries (establishing standards equivalent to those of private vehicles, which has been delayed in Europe) and green two-wheeled vehicles will be of great interest to the Chinese market¹⁹.

The other level of energy transition is the building sector²⁰. Since 2010, half of China's population is urban; this is expected to rise to two-thirds by 2030 and the total inhabited area will be doubled²¹. Given that most of the energy demand in buildings in China comes from heating and its main source of generation is coal, (a major cause of urban pollution), the introduction to China of passive energy building techniques, developed in Europe through the CEPHEUS project, could represent, in our opinion, a strong advantage.

| Improving energy efficiency (factories, cities, agriculture)

Finally, the last issue examined relates to energy efficiency. It is at this level that the technology and managerial know-how offered by European companies can prove to be the most decisive. Contrasting with the situation in Europe, energy is often the first item of expenditure for a Chinese company where the cost of labour can be three to five times lower. In this sector, Energy Service Companies (ESCO) in Europe, where the market has developed in since 2005, are best positioned vis-à-vis the Chinese energy efficiency market where demand is very strong. The fields of application are varied. The most important market is retrofitting Chinese plants that no longer comply with standards. The next important task is to provide support in the design of innovative new factories. In both cases, the most promising areas are those of cogeneration and conversion

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^{16.} Hong Huo, "China's Energy Use and GHG Emissions in the Transportation Sector", China Energy Issues in the 12th Five-year Plan and Beyond Conference, University of Singapore, February 2012.

^{17.} International Energy Agency, *Transport Energy and CO2: Moving Towards Sustainability*, 2009, 418 p.

^{18.} Bill Russo, Edward Tse, Tao Ke, *China's Automotive Opportunity: Leading the Transition to New Energy Vehicles*, Beijing: Booz & Co., 2009, 16 p.

^{19.} Institut für Energie und Umweltforschung, *Transport in China: Energy Consumption and Emission of Different Transport Modes*, Heidelberg, May 2008, 80 p.

^{20.} CCICED, *Energy efficiency and Urban Development (the building sector and the transport sector)*, November 2009, 40 p.

^{21.} Janamitra Devan, Stefano Negri, Jonathan R. Woetzel, "Meeting the challenges of China's growing cities", *The McKinsey Quaterly*, 2008, n° 3, 107-117.



of heat into electricity²². The Confederation of European Waste-to-Energy Plants demonstrates Europe's expertise in this area.

Energy efficiency also applies to urban activities. The problems of rapid urbanisation in China are well known, where by 2025 there are expected to be 225 cities with more than one million inhabitants and 23 cities with more than five million people. However, since the *Green Paper on the Urban Environment* was published in 1990 by the European Commission²³ Europe has developed real expertise in the field of sustainable urban development.

Finally, energy efficiency also applies to agriculture²⁴. This is a highly strategic sector because China needs maintain a level of agricultural self-sufficiency close to 90% in order to ensure its food sovereignty. If total agricultural productivity has increased by about 2.5% per year since 1975, the energy efficiency of the production as a whole remains relatively low (especially for crop irrigation) while the ecological cost is high (soil erosion and desertification): recent innovations such as remote sensing applied to agriculture are yet to be implemented in China.

^{22.} Research and Markets, *China Waste-to-Energy Plants Market Forecast & Opportunities 2018*, Dublin: Research and Markets, 2013, 150 p.

^{23.} Commission of European Communities, *Green Paper on the Environment*, Brussels, 27 June 1990, 63 p.

^{24.} Songqing Jin, Jikun Huang, and Scott Rozelle Agricultural Productivity in China, In *The Shifting Patterns of Agricultural Production and Productivity Worldwide* Edited by Julian M. Alston, Bruce A. Babcock, and Philip G. Pardey, Ames (Iowa): Center for Agricultural and Rural Development, 2010.

| CHINA'S NEW ENERGY POLICY: CHALLENGES, OBSTACLES AND OPPORTUNITIES

| One point concerning the 12th five-year plan 2011-2015 in China

On 14 March 2011, the National People's Congress of the People's Republic of China approved a national five-year development program, beginning in 2011 and ending in 2015²⁵. This 12th five-year plan has ambitious targets in terms of reducing pollution²⁶, energy efficiency and preserving resources. The annual average growth target for the five years is set at 7%. There is renewed commitment to developing Eastern China (a new field of opportunities that will be explored at the Chinese-European business meeting in October 2104 in Chengdu on the topic *Intelligent, Green, Environment Protection: EU-China Urbanization Cooperation Practice*), increasing the rate of urbanisation (where demand from the housing sector for innovation will be more sustained and durable) and reducing inequality (which should imply an increase in wages of around 13% per year).

The plan's energy targets are very ambitious: increasing the use of renewable energy by 11.4% by 2015 (and 20% by 2020); reducing energy use per unit of GDP by 16%; reducing CO2 emissions per unit of GDP by 17%; reducing nitrogen pollution in the air by 10%, ammonia pollution in soils by 10% and sulphur pollution and water oxidants by 8%. The overall target for 2020 is to reduce

^{25.} KPGM China, China's 12th Five-Year Plan Overview, March 2011, 4 p.

^{26.} Lin Xinyan and Mark Elder, *Major Development in China's National Air Policies in the Early 12th Five-Year Plan*, Kanagawa: Institute for Global Environmental Strategies, March 2014, 98 p.



carbon intensity (CO2 emissions per unit of GDP) by 40 to 45% compared to 2005 levels.

To achieve this goal, a reallocation of subsidies and investments is required.

In fact, this 12^{th} five-year plan features massive investments: \in 330 billion will be invested in environmental protection measures, which will make China the world's largest market in this sector; between \in 220 and \in 330 billion will be invested in renewable energy including \in 170 billion for wind and \in 33 billion for solar projects. Finally, \in 8 billion will be spent on water treatment, collected through a new tax on the sale of land.

| Implementation difficulties of the 12th plan: forecasts and pre-assessment

Although the plan's objectives are very ambitious and the allocated resources are significant, difficulties arise in its implementation. The main problem stems from the relative autonomy of regional and local government bodies in relation to central government and the often fierce competition between regions to attract capital. Moreover, the main criterion for internal promotion remains development-related performance. In addition, the lack of transparency and widespread corruption make the traceability of aid and the monitoring of real performance a difficult task for central Government, which must contend with strong grass-roots demands. For all these reasons, evaluating the success of the 12th five-year plan on energy and environment is highly complex.

On 23 April 2014, Xu Lin, the Director of the National Commission for Development and Reform (NCDR) said that according to him most of the targets would be completed: at the end of 2013, according to official data, 9% of the 16% target for the improvement of energy efficiency and 10% of the 17% target for carbon intensity reduction planned for 2015 had already been reached²⁷. However, it seems difficult to complete over two-thirds of the target in the final two years, especially since gains are increasingly hard to obtain as you get closer to the initial targets at equivalent growth rates. We recall that in 2009, in order to fulfil the objectives of the 11th plan, many factories were forced to shut down: the environmental objective was achieved at the expense of GDP. On 29 March 2014, a study by Chinese researchers from Tsinghua University in Beijing and the University of San Diego stated that the objectives of the 12th plan could not be achieved: by 2020, CO2 emissions were expected to increase by 56% overall and emissions per unit of GDP would fall by 33% compared to 2005 levels and not by 40 to 45%; by 2015, carbon intensity would only decrease by 8.8% and not 17%²⁸. In 2013, an article in the Stanford Social Innovation Review revealed the Government's inability to respect its commitment to clean vehicles by pointing out two important facts: the absence of a sufficiently modern, extended and stable power grid to support the transfer of electricity generated by new power plants (photovoltaic or wind energy cannot be easily stored) and the failure to take into account the fact that the electric car, owing to its price, is more suited to more mature car markets²⁹. The difficulties in promoting

^{27.} Xiaoyi Shao and David Stanway, *China now on track to meet 2015 emissions targets-state planner*, Reuters, 23 April 2014.

^{28.} Yang Yuan, Zhang Junjie, Wang Can, *Is China on Track to Comply with its 2020 Copenhagen Carbon Intensity Commitment?*, Department of Economics, California University San Diego, 2014, 40 p.

^{29.} Christopher Marquis, Hongyu Zhang, & Lixuan Zhou, "China's Quest to Adopt Electric Vehicles", *Stanford Social Innovation Review*, Spring 2013, 53-57.



the electric car illustrate the obstacles facing China in its goal of producing 100 gigawatts of wind energy and 21 gigawatts of solar energy (an increase of 40%) by 2015: this cannot be achieved without resolving the issues of the transmission grid and national storage needs.

| Barriers on entering the **Chinese market for European companies**

The gap between the projections and achievements sets the ground for future opportunities, allowing European companies to position themselves and improve their offers.

Since in China, European companies face many challenges³⁰. Investment by the Chinese government in the field of renewable energy is primarily directed at Chinese companies. The "Buy Chinese" (买 中国 货) policy (a 2005 law requires that wind farms to use 70% of Chinese products) and the domestic innovation strategy create an obvious distortion of competition³¹. Furthermore, China is by no means a tax haven for foreign companies: corporate income tax stands at 25%; although it can be reduced to 15% provided that the resident foreign company forms a partnership with a local company (a mandatory requirement) and provides essential patented technology (core proprietary intellectual property) - which, in the context of China's undeveloped intellectual property framework, is a meagre incentive. Finally, the lack of transparency in the publication of available aids and grants along with the often opaque nature of the decisions validating an industrial project and their multiplicity at different levels (local, regional, national) are barriers to SMEs that lack the political and economic networking advantages of multinationals.

30. Jonathan Story, Winning China's Market: an SME Investment Guide, Understanding China Programme, Summer 2010,

^{31.} James McGregor, China's Drive for 'Indigenous Innovation': A Web of Industrial Policies, US Chamber of Commerce,

^{2009, 44} p.

| EVALUATION OF EU POLICIES AND RECOMMENDATIONS

The strategic nature of energy investment means that sustainable development, in a country which is concerned about its political and financial independence, is a somewhat illiberal sector; thus, in order to break new ground, European companies need the support of Europe acting as a united entity with a common goal³².

In recent years significant improvements have emerged (creation of the Office of Intellectual Property in Beijing, the European Business Network, and the European Centre for SMEs)³³ which help make an environment that is linguistically, politically and legally very different, more accessible to European companies³⁴.

However, in view of the overall framework and the difficulties encountered, a number of recommendations seem necessary. We therefore propose a set of eight recommendations hinged on three clear findings.

^{32.} European Commission, EU-China 2020 Strategic Agenda for Cooperation, 2012, 16 p.

^{33.} Tan Copsey and Isabel Hilton, *Greening China: Outlook for European SMES*, Understanding China Programme, Spring 2011, 36 p.

^{34.} Dennis Pamlin, China, EU need to overcome five communications challenges to build a low-carbon future, *China Daily*, June 2011, 3 p.



Finding 1 | Europe, with a downturn in growth and burdened by a high unemployment rate, is struggling to implement the policies required for a successful energy transition. Thus, creating an environment conducive to sustainable economic development environment in Europe itself is the first condition for the success of its companies in China.

Recommendation 1 | Maintain ambitious targets in terms of sustainable development, including renewable energy in Europe - for example, by massively redirecting subsidies to environmentally responsible companies and using EU funding for research in these key sectors;

Recommendation 2 | Encourage the creation of intra-European partnerships and consortia in the field of energy and sustainable development to provide a joint offer and promote convergence in terms of research and development.

Finding 2 | The problem in Europe is that it seems strong when imposing its will on Member States, but weak when addressing other countries (especially China): hard with its partners and weak with its competitors, Europe is struggling to be loved by its citizens. While some countries benefit from this fragmentation of European trade policies, the region's trade deficit with China, amounting to € 147 billion in 2012, clearly shows that such a strategy is detrimental.

Recommendation 3 | Establish an *economic diplomacy* platform common to all Member States of the European Union in their relationship with China to replace the competition between Member States in order to gain market share *in* China by using their complementarity to take market share *from* China.

Recommendation 4 | Oblige Member States to replace their bilateral agreements with China by a single framework agreement specifying the legal and environmental requirements for political and economic relations with China.



Finding 3 | China is an illiberal capitalist state (capitalist in the sense that it advocates a productivist economy that gives rise to the asymmetric accumulation of development wealth in favour of a global elite, illiberal in the sense that it does not respect the principle of free-enterprise nor does it recognise individual freedom). The domestic market is structured to allow the emergence of national leading companies.

Recommendation 5 | Establish conditions for European research and development aid to China in return for equitable access to the internal market and effective reciprocity in terms of circulation of people and goods (to prevent dumping).

Recommendation 6 | Bind the joint venture and technology transfer obligations to the ability of the Chinese partner to apply for State aid and share it.

Recommendation 7 | Make available to all European businesses, a prospective diagnosis of Chinese energy policy that does not rely on official data (this can be unreliable) while highlighting the risks as well as investment opportunities and increase the number of IPR Helpdesks (Intellectual Property Rights) in all major Chinese cities to provide SMEs with access to the services of a network of European lawyers in situ who specialise in Chinese law.

Recommendation 8 | Propose a European one-stop-shop for investment aid in China by placing the chambers of commerce of the Member States under the unified leadership of the European Chamber of Commerce.