



## Environmental sector China

From major building site to growth market

February 28, 2006

**Economic growth in China is anything but sustainable.** China's economy is booming at the expense of its environment. The country's resource efficiency is nowhere near the level of western nations. Per unit of gross domestic product China consumes more than four times as much energy as, for example, Germany and more than seven times as much as Japan. The most serious environmental problems facing the country are its severe air pollution and the inadequate quality and shortage of water. Nor do the social standards for Chinese workers match those in traditional industrial countries.

**Ecological problems in China are increasingly leading to bottlenecks.** Shortages of important resources are reducing growth potential in industry and other sectors in China. Only swift transition to more efficient production methods can prevent the "environment" placing even greater constraints on the country's economic development. Determined action against environmental degradation would certainly slow the rates of growth in the short term. But uncompromising environmental measures are the prerequisite for sustainable growth.

**The Chinese environmental market holds out huge opportunities for foreign companies.** For an emerging market, the environmental legislation in China is progressive, although implementation in the various regions leaves much to be desired. Several hundreds of billions of US dollars are likely to be invested in environmental technology in China over the next 20 years, for which the country needs private know-how and capital from abroad. This opens up enormous opportunities for foreign companies, notably German firms with many years of experience in this field. The forecast investment will be driven mainly by economic necessity, but increasingly also by the realisation that in the long run the Chinese economy will benefit only from sustainable growth.

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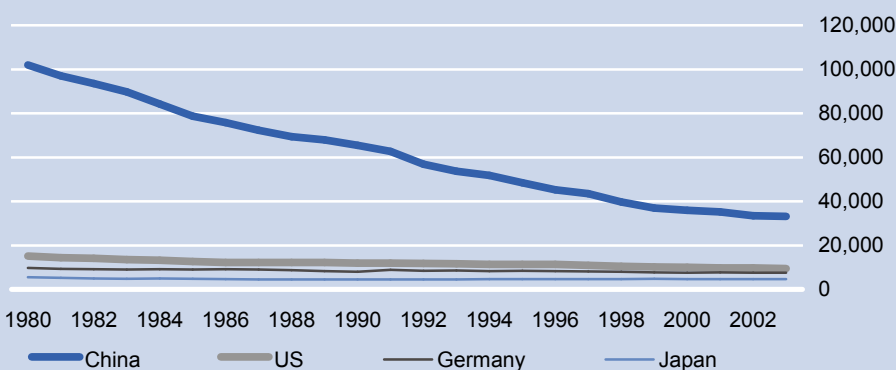
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### High energy intensity in China despite considerable progress\*

BTU per US dollar of GDP



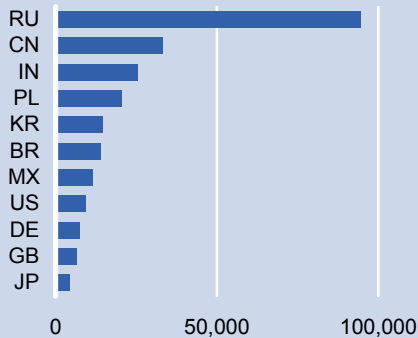
\* Total energy consumption per unit of GDP (in USD, exchange rate-adjusted)

Source: EIA



### China's energy intensity high by internat. standards\*

BTU per US dollar of GDP



\* Total energy consumption per unit of GDP (in USD, exchange rate-adjusted)

Source: EIA

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China's headlong economic growth in latter decades has taken a heavy toll on the environment, underscored not only by the recent spate of toxic chemical spills in Chinese factories that caused considerable damage to the ecosystem. If the country wishes to prevent long-term environmental disasters and the social conflicts they are likely to trigger and avoid permanently having to curtail its growth potential, it must move quickly and decisively to redress the balance.

Among the most serious environmental problems in the Middle Kingdom are the poor air quality, water pollution and water shortage. There are also many other developments of environmental concern, most of them caused by the pace of China's economic growth (e.g. rising volumes of waste, land consumption). But the country also has to contend with a number of "traditional" environmental problems, endemic for centuries (drought, flooding, desertification, erosion), that have been exacerbated by more recent human intrusion. Such environmental wrong turns generally have a negative impact on the population or the people working in certain sectors of industry.

### Huge cost of environmental pollution

The costs of environmental pollution and ecocide in China are exorbitant. They amount to around 8 to 12% of China's GDP, although other estimates put an even higher figure on them.<sup>1</sup> Another negative factor in this context is the inefficient use of raw materials, which is tantamount to squandering scant natural resources. According to the Energy Information Administration (EIA) the country's energy efficiency, measured in primary energy consumption per unit of GDP, is less than four times that in Germany; other sources arrive at a far worse performance. Potentially it is estimated that efficiency in the energy sector could be boosted by between 30 and 50%. Industry could also cut back substantially on its energy consumption with more efficient production methods.

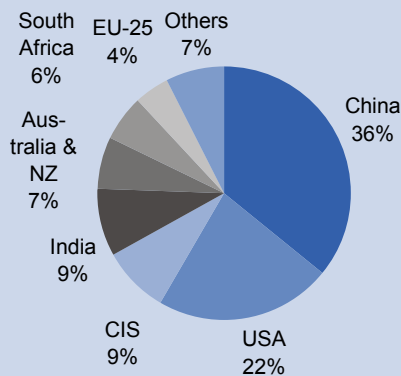
China is now the world's second biggest petroleum importer and consumer. The latter-year surge in quotations for crude oil has been fuelled mainly by China's enormous appetite for energy. Consequently the inefficient use of resources in China has direct repercussions on the rest of the world. Demand from China is naturally also driving up the prices of other raw materials: China consumes about a third of the world's coal, a quarter of steel and two-fifths of copper.

### Fundamental awareness of environmental problems

Some politicians in China do appear to have recognised the basic environmental problem, though. By emerging market standards, the country possesses modern, extensive and explicit environmental legislation.<sup>2</sup> Furthermore, at the end of 2005 the State Environmental Protection Administration (SEPA), China's ministry of the environment, announced plans to invest around USD 160 bn in environmental protection (focusing on air and water) from 2006 to

### Chinese coal mining predominant

Shares of global hard coal output 2004



Source: Coal industry statistics 2005

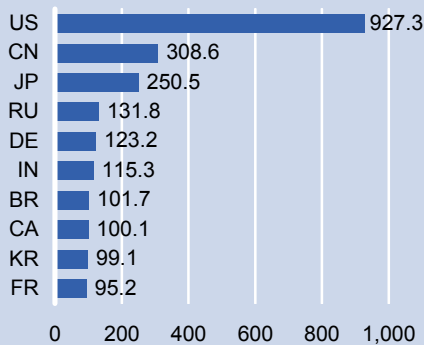
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<sup>1</sup> See Sternfeld, Eva and Christoph Graf von Waldersee (2005). Die Lage der Umwelt in China. In Internationale Politik, December 2005. Berlin.

<sup>2</sup> The first national environmental protection law was passed as early as 1979. It has been followed by an array of further laws with a special focus on individual areas of the environment (e.g. water, air, waste) and for the protection of natural resources, some 375 environmental standards and more than 900 local environmental regulations.

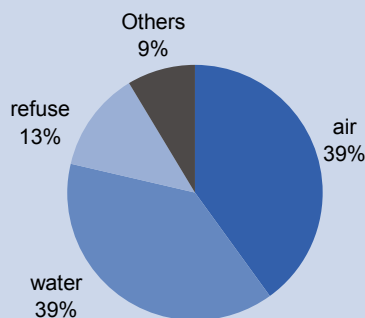
### China already second biggest oil user

The ten biggest petroleum users in the world 2004, million t



Source: ExxonMobil **3**

### Environmental protection focused on air and water\*

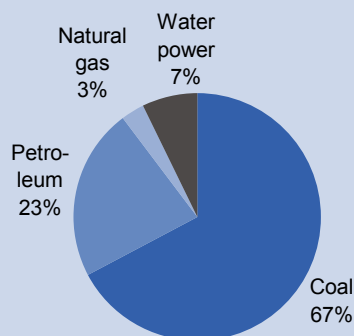


\* Proportions of investment scheduled for various parts of the environment in 10th FYP

Source: SEPA **4**

### Energy consumption in China mainly coal-based

Shares of energy sources in primary energy consumption 2003



Source: China Statistical Yearbook 2004 **5**

2010; that would be twice as much as in the previous five years. The aim to establish a “harmonious society” is, moreover, set out in the 11<sup>th</sup> Five Year Plan (FYP) running until 2010. Other targets are to be pursued besides economic growth: reducing unemployment and increasing employment, more social security, combating poverty, improved education, medical care and environmental protection. Higher or new taxes on fuels or vehicle purchases, for instance, have also been announced. So a process of rethinking is gradually taking place.

In many cases protection of the environment has foundered so far because legislation has not been adequately implemented in the provinces. Economic growth takes top priority. Regional politicians are judged first and foremost by this and not by ecological criteria. Of course a lack of capital and know-how, and ignorance on the part of the population are also important contributory factors. Many of the environmental protection measures scheduled in the last FYP could not be realised for a shortage of funding, among other things. And finally, in a country in which millions of people still regularly go hungry for all the progress achieved in recent years, environmental aspects are naturally rated differently than in developed countries.

The following discusses the major negative environmental developments in China and indicates possible solution approaches.

### Air pollution: getting difficult to breathe

The poor air quality in China is one of the country’s most striking problems. Larger cities in particular suffer almost permanently from smog. Dust, soot, sulphur dioxide (SO<sub>2</sub>) and nitrogen oxides are the main pollutants in the air the people breathe. Of the 20 cities featuring the worst air quality in the world, 16 alone are in China. According to a World Bank study, the majority of cities in China exhibit maximum-category dust pollution. The World Health Organisation (WHO) estimates that the poor urban air quality is responsible for around 250,000 deaths each year in China. The World Bank puts the number of fatalities even higher. Even the SEPA observes that two-thirds of China’s urban population live in cities with bad or very bad air quality. Besides severe pollution of the air inhaled, acid rain is another consequence of the grim air quality. Acid rain falls regularly on about one-third of the Chinese land mass – with correspondingly negative results for the soil, flora and ground water. The SEPA estimates the losses in agriculture and forestry from acid rain at around USD 13 bn p.a.

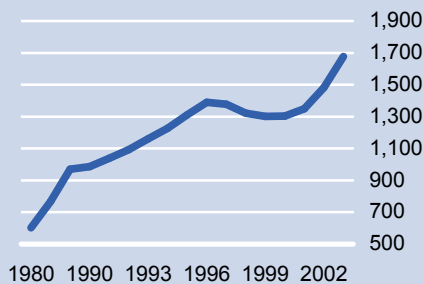
### Perpetrators: energy sector, industry and transport

The reasons for the poor quality of the air are well-known. They lie chiefly in the operation of obsolete coal-fired power stations and industrial plant, some of which lack any filter technology whatsoever. In the cities the environment is subject to further pollution from the rising level of motorisation, exacerbated by the fact that most vehicles are not fitted with catalytic converters or other filter technologies. In many regions coal fires discharge pollutants into the air. The large number of small heating systems in domestic households – mostly coal- or wood-fired for lack of any other alternative – is a major contributor to the bad air quality.

China’s energy supply concentrates on coal. Roughly 65% of the country’s primary energy consumption is based on this source; official Chinese sources quote figures of around 67% (by way of comparison, the figure in Germany is 25%). It would be an illusion to assume that this reliance on coal will decrease appreciably in the

### Rapid rise in China energy consumption

Energy consumption in million tonnes SCE\*



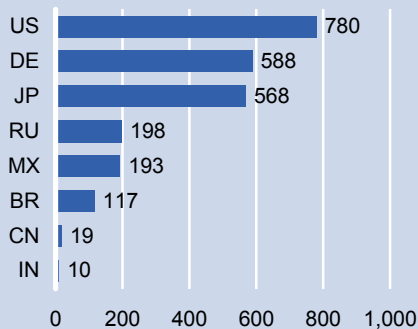
\* Standard Coal Equivalent

Source: China Statistical Yearbook 2004

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### Low vehicle density in China

Vehicles per 1,000 inhabitants, 2004

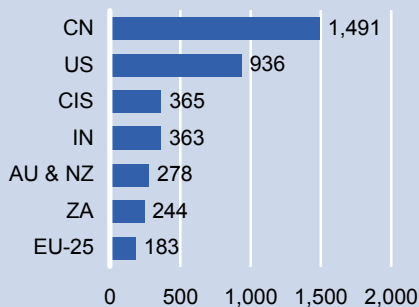


Source: VDA

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### China major hard coal producer

Output of hard coal in million t, 2004



Source: Coal industry statistics 2005

8

next few years, particularly since in 2004 China was short of around 30 to 40 gigawatts (GW) of power generation capacities and demand is rising relentlessly. However, in 2004 alone another roughly 50 GW were taken on stream, bringing total capacity up to about 450 GW. After China switched years ago from being a net exporter of crude oil to the world's second biggest petroleum importer, coal is the only important energy-producing raw material of which it possesses sufficient quantities in the long term. For years to come China's hunger for energy will therefore be satisfied primarily by coal. By 2025 the EIA expects coal consumption in China roughly to double on its present level.

The problem in terms of air quality, though, is that the existing coal-fired power plants have low efficiency ratios and as a rule the flue gases are not desulphurised; at most, 5% of coal-burning power plants in China are equipped with desulphurisation facilities. Older-type coal-burning power stations are therefore major contributors to the high emission of SO<sub>2</sub>. What is more, energy-intensive industrial plant (e.g. steelworks, chemical plant) often do not treat the emissions at all.

The rising degree of motorisation is not the only problem on the roads; because the road infrastructure in many cities cannot cope with expanding motorised private transport, traffic snarl-ups – giving rise to higher noxious emissions – are already a common sight in many Chinese cities even though vehicle density in China, at less than 20 vehicles per 1,000 inhabitants, is only a fraction of the level in industrialised countries (in Germany the figure is 588 vehicles per 1,000).

Coal mine-related fires, a typical phenomenon in China, are another cause of poor air quality. Each year burning coal seams result in the loss of around 100 million tonnes of coal for mining – four times the amount of hard coal produced 2004 in Germany. Not only do the coal fires pollute the ambient air; through the immense discharge of CO<sub>2</sub> and methane they are presumably playing a part in climate change. Although initiatives have been launched in China to extinguish the coal fires, this is likely to take years.

Last but not least coalmining in China is the cause of many human tragedies. More than 6,000 miners were killed in 2004 in Chinese coal pits, due chiefly to inadequate safety standards. According to the Worldwatch Institute, statistically speaking every million tonnes of coal mined per year costs three lives. The comparable figure in the United States is 0.03 lives. About 80% of coal mining deaths throughout the world occur in China.

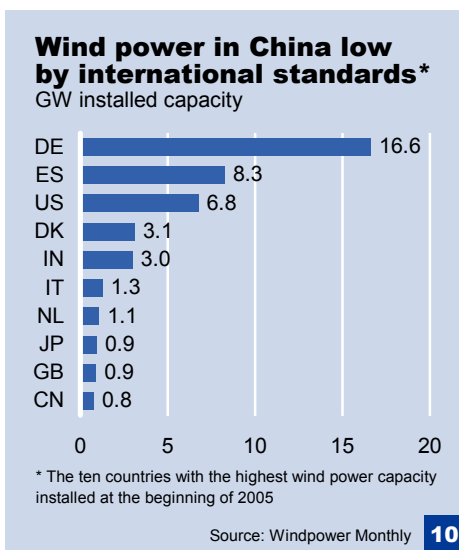
### Redressing the balance: painful, costly, but necessary

Suitable steps to improve the air quality must start with the biggest polluters. These are first and foremost the energy sector and hence coal-fired power stations. Measures that could be implemented to contain SO<sub>2</sub> emissions, for instance, comprise financial support for desulphurisation facilities in power stations (notably for retrofitting), giving preference to low-sulphur power plants for feed-in to the power grid, the introduction of SO<sub>2</sub> charges or support for the use of low-sulphur coal.<sup>3</sup> Market instruments such as SO<sub>2</sub> emission rights trading could be effective; at any rate this tool has been successful in the US. But with many older power plants the most sensible

<sup>3</sup> See Netzwerk Internationale Technologiekoooperation (2004). Der Umweltsektor in China. Berlin.



#### Purchase guarantees planned for electricity from renewables



alternative would be to close them down altogether. The Chinese government has already launched and financed some coal power plant modernisation projects and passed appropriate legislation. SO<sub>2</sub> emissions, having been seen to decline in the interim, climbed sharply again in 2003 and 2004 according to official statistics, hitting a level of about 22.5 million tonnes in 2004 (compared with 0.6 million tonnes in Germany). On the whole, it should be possible gradually to lower SO<sub>2</sub> emissions moving forward.

Of course, less subsidisation of energy prices in China – particularly for industry – would also have a positive impact on air quality. At present low energy prices as a result of subsidisation are creating a disincentive to investment in environmentally friendly technologies – both by power plants and industries. Market prices have seldom failed to act as a stimulus. Higher revenues would also create a source of financing for desulphurisation plants and other filter systems. The government could also help households gradually convert their domestic heating from coal to gas. A project of this kind is already being practised successfully in Peking, with measurable impact on the quality of the air in the city.

#### Renewables on the advance

In terms of the improvement of air quality, great hopes are naturally placed in renewable energy. The first-ever renewable energy law in China came into force at the beginning of 2006. It sets the ambitious goal of satisfying around 10% of total energy consumption from renewables by 2020. At an international conference on renewable energy end-2005 in Peking vice premier Zeng Peiyan even announced an increase in the share of renewables to 15%.<sup>4</sup> The law provides, among other things, for feed-in tariffs and purchase guarantees for electricity from renewable sources. It also contains tax incentives and other promotion programmes for projects in this field. The volume of investment in renewable energy alone in the coming years is estimated at more than USD 150 bn.

Although the People's Republic has a long tradition in the use of renewable energy, this has so far focused on hydro electric energy. A quantum leap is set to take place here when the Three Gorges Dam is taken on stream, probably in 2009. The power plant will have rated output of 18 GW, equivalent to the output of roughly 18 average German nuclear power plants. But the dam is also a typical example of the prioritisation of economic over ecological and social concerns in that it encroaches massively on the environment and millions of people have had to be resettled.

In addition to hydro-energy, moving forward wind, bio- and solar energy, geothermia and tidal power plants will also figure more prominently. Essentially, the country is well placed for this. Massive capacity expansion is expected particularly in wind energy. Power generation capacity, around 764 megawatts at the beginning of 2005, is scheduled to rise to 20 GW by 2020; other sources state 30 GW as the target level. By comparison, at the end of 2004 not quite 17 GW were installed in Germany, the world's major wind energy producing country. A market worth billions is thus set to open up to suppliers from Germany and other leading wind energy technology nations. The arithmetically developable wind energy

<sup>4</sup> Statements on the current proportion of renewable energy differ in literature. While some sources quote a share of 3% of total energy consumption, the China Statistical Year Book and the EIA put the share at slightly more than 7%. It is certain, though, that the present focus is clearly on hydro-energy.



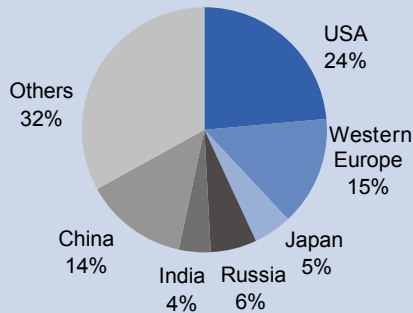
potential including offshore installations is many times higher than the above figures.

Massive capacity expansion is also expected in solar energy, both in solar thermia and photovoltaics. Two-thirds of the country registers more than 2,200 hours of sunshine a year. However, even in future solar energy will still account for only a marginal share of the country's power supply. More important with this source of energy is undoubtedly the electrification of rural areas and support with water heating. In the run-up to the 2008 Olympic Games and EXPO 2010 Peking and Shanghai are realising a few solar projects, but these are essentially of a symbolic nature. Foreign solar energy expertise is also in demand. In the very long term hydrogen production from solar-based technologies in sunny parts of the country could come into the picture.

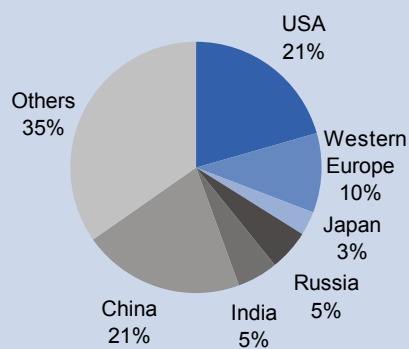
**China draws level with USA on CO<sub>2</sub> emissions**

Share of global CO<sub>2</sub> emissions

2002



2025



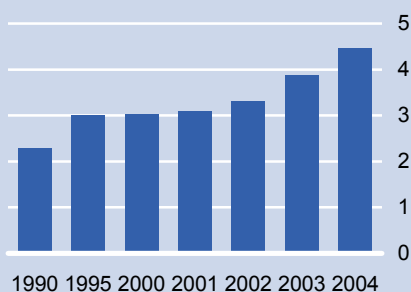
Source: EIA **11**

**Transport: stricter exhaust standards needed**

There are various ways of combating rising emissions in the transport sector. Automobile exhaust standards modelled on European norms have already been introduced in many cities, among them Peking. Higher taxes on vehicles with excessive exhaust emissions would also be advisable. In the medium term efficient traffic management systems, toll charges or even temporary driving bans seem a suitable way of averting the imminent collapse of inner-city traffic and improving the air quality. In many big cities the world over, devices of this kind have considerably reduced road traffic (e.g. London, Singapore). And finally, greater use of local public transport and development of the relevant infrastructure are sensible ways in many cities of reducing noxious emissions from transport. Here, too, there are some positive examples. Peking, for one, can boast the world's biggest fleet of gas-powered buses. However, practically no Chinese cities operate underground rail systems. The example of the Transrapid shows how open-minded China is on environmentally friendly means of transport; moving forward, the Transrapid Maglev system stands a good chance of being used on longer routes as well. For both intelligent traffic management and toll systems and modern local public transport technology, China could show greater demand in future for western know-how and capital (under PPP projects, say).

**Energy-related CO<sub>2</sub> emissions in China increasing**

Billion t

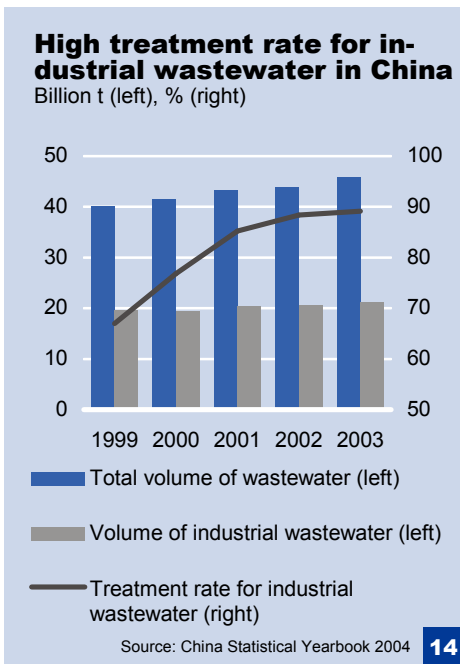
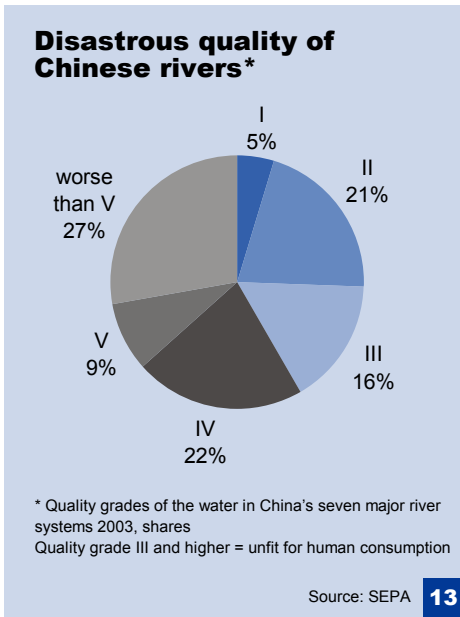


Source: DIW **12**

**CO<sub>2</sub> emissions set to mount**

While the previously described problems with air pollution are essentially of a regional or national nature, the rapid escalation in emissions of CO<sub>2</sub> and other greenhouse gases in China is exacerbating the global greenhouse effect. Already, the People's Republic is the second biggest emitter of CO<sub>2</sub> after the United States. By around 2020 it will draw level with the US in this statistic. China is unlikely in the foreseeable future to commit to quantitative targets for limiting greenhouse gas emissions as laid down in the Kyoto Protocol, for fear of restricting its own growth potential as a result. Like the Americans, the Chinese prefer to focus on new technologies.<sup>5</sup> Nuclear energy also features prominently in the Chinese government's plans. Capacities are to be increased many times over in the coming years, albeit from a low base level. Up to

<sup>5</sup> China joined India, Japan, South Korea, Australia and the US in 2005 to form the Asia Pacific Partnership on Clean Development and Climate. Its aim is to address climate change through the development of environmentally-friendly technologies. The initiative is criticised in many quarters as being a counter-strategy to the Kyoto process.



30 new nuclear power plants could go on stream by 2025. Yet even greater use of nuclear power or renewables will presumably do no more than mitigate the expected increase in CO<sub>2</sub> emissions moving forward. It is hoped that the flexible mechanisms of the Kyoto Protocol (Clean Development Mechanism) will also encourage foreign investors to realise more climate protection projects in China.

### Water: a scarce and contaminated resource

China's greatest cause for concern, apart from the poor air quality, is the shortage and pollution of its water supplies. Although statistics differ on this, too, all the figures are alarming. Whether not quite 350 million people in China (according to SEPA) or 700 million (World Bank) have no access to clean drinking water and are thus obliged to drink from contaminated sources, is equally appalling.

SEPA states that about 75% of the water in the country's seven most important river systems is of a quality unfit for human consumption. Only 7.5% of the water from the inland fresh water lakes and artificial drinking water reservoirs is of an acceptable standard. Half the 660 statistically recorded cities in China (among them over 170 with more than a million inhabitants) suffer from seriously contaminated groundwater. In around 400 cities the groundwater is consumed more quickly than new can form, causing a steady drop in the groundwater table.

Renewable water resources per capita in China are about a quarter of the world average. Owing to the regionally and seasonally unequal distribution of rainfall, groundwater and surface water, this share is far lower still in the dry west and north of the country; in some places it is only a tenth of the global mean.<sup>6</sup> Already, production losses in industry due to water shortages are not uncommon. In these regions droughts are a permanent fact of life, with deserts spreading by around 3,000 km<sup>2</sup> a year.

It is estimated that only a quarter of the wastewater in China is clarified or treated. Yet considerable progress has already been made in recent years, with the result that the treatment rate is much higher for industrial wastewater (officially stated at 90% on average) and in many cities. However, in comparison to, say, Germany (almost 100%) the rate is still very low.<sup>7</sup> In most rural regions domestic wastewater is not treated at all. In 2003 the huge country had barely more than 500 municipal sewage treatment plants! Yet 10,000 would be needed nationwide to treat 50% of the wastewater from domestic households. Although legislation is in place requiring the construction of sewage treatment plants for cities with more than 500,000 inhabitants, thus far its implementation has left much to be desired – due partly to a lack of funds. The direct discharge of wastewater into rivers and lakes is therefore the main cause of the country's poor water quality. The situation is compounded by over-fertilisation and excessive use of pesticides in agriculture and the leakage of industrial or domestic wastewater through defective sewage pipes.

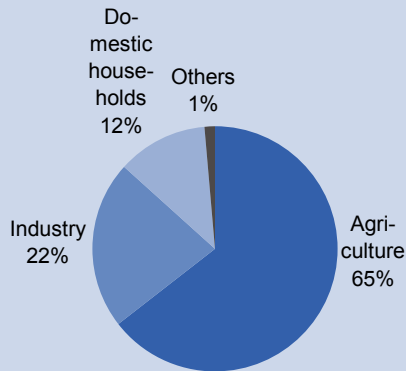
<sup>6</sup> See U.S. Department of Commerce (2005). Water Supply and Wastewater Treatment Market in China. Washington.

<sup>7</sup> According to the China Statistical Yearbook (2004) there were about 66,000 industrial wastewater treatment plants in 2003. On average across all branches of industry, 90% of the wastewater met the required disposal standards.



### Agriculture biggest user of water in China

Shares of water consumption 2003



Source: China Statistical Yearbook 2004

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### Ideally little irrigation-intensive agriculture

### Massive investment expected in wastewater treatment technology

## Rethinking agricultural irrigation

A major reason for China's water shortage is its intensive agricultural irrigation. 65% of the water is used for agriculture. Specifically in the arid regions, agricultural irrigation, with its unsustainable use of groundwater resources, competes directly with industrial and domestic usage. Only very seldom are irrigation methods state-of-the-art, high leakage losses are the norm.

Given the prominent position of agriculture in China, it makes sense to set about conservation in this sector, so that growing demand from industry and households can be satisfied moving forward. A very significant step would be a substantial increase in water prices and wastewater tariffs or, indeed, their introduction in the first place. Thus far water prices are heavily subsidised, which means that the shortage of this resource is not adequately factored into its pricing. This encourages squandering, both in agriculture and by industry and households. Notwithstanding the shortage of water, domestic water consumption per capita and annum in China is two-thirds higher than in Germany. However, in its Water Resource Law 2002 the Chinese government moved to reverse its previous policy towards higher and consumption-based charges. Of course, in rural regions price and tariff increases must take account of people's ability to pay.

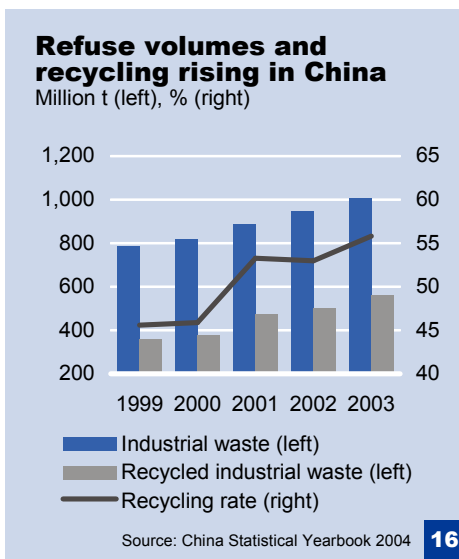
Consideration should also be given to the gradual conversion of agricultural output to less irrigation-intensive produce. Rice and cotton, for instance, are crops that require a lot of water and should, if possible, be cultivated only in regions with sufficient rainfall or surface water. In return, agricultural products for whose cultivation the climate in China is not ideal could be purchased in greater quantities on the world market. For this, farmers would of course have to be adequately compensated.

## Need for better wastewater treatment

The main reason for the miserable water quality in China is the discharge of untreated wastewater by industry and households. In the coming years the People's Republic therefore needs massive investment in wastewater treatment technology – one of government's declared aims. To resolve the most pressing problems in the water sector (drinking water supply and wastewater removal) investment of at least USD 200 bn will presumably be needed in the next 15 to 20 years.

Implementation of China's ambitious goals has often failed in the past for lack of capital or because of other priorities. Moving forward, it is therefore unlikely that the country will be able to cope with the necessary investment on its own. Foreign capital and know-how are thus needed. Companies from abroad have been active on the Chinese water market for some time now. Build, operate, transfer (BOT) projects often play an important part here, with foreign companies building, say, a sewage treatment plant, operating it for a certain period and then transferring it back to the public authorities. Increasing use is likely to be made of this model in urban areas. Cooperation agreements and joint ventures with local companies are other possibilities.

In parallel to this, environmental standards for industrial enterprises should be tightened up considerably and, most importantly, control and sanction mechanisms improved. Penalties for infringements of environmental regulations are not high enough – not only in the



**Social unrest likely as a result of environmental problems**

water industry. Beefing up SEPA personnel and strengthening its authority and powers over regional agencies would also be helpful.

**Other environmental “hotspots”**

Apart from the poor air quality and acute water shortage and contamination, the country has other environmental problems to contend with as well. The volume of refuse is rising rapidly with the standard of living, especially in urban areas. Growth of at least 10% p.a. is forecast for the coming years. Yet already only 20% of this refuse is disposed of in an environmentally compatible manner, although official statistics do put the recycling ratio for industrial waste higher. In many cases refuse lands on unsanctioned tips. The municipal authorities have failed to adjust their refuse disposal capacities to the rapid growth in the volume of waste. What the Chinese need most urgently are modern refuse incinerators and landfills from which there is no seepage into the groundwater or escaping landfill gas; many landfills are ticking time bombs, particularly since hazardous wastes such as clinical waste often end up untreated in landfill sites. Here, too, investment running into the billions is needed in the coming years, holding out opportunities for foreign companies. Detrimental to commitments by international firms, though, is that charges are not generally levied on refuse. But the authorities are likely to take action on this, too.

Massive land consumption and steady desertification are further serious environmental issues. Different sources put arable land loss in China at between 3,000 km<sup>2</sup> and 6,000 km<sup>2</sup> a year, mainly as a result of building and other uses, but also because of soil pollution. This land consumption is a direct result of industrialisation and is, to the government’s way of thinking, necessary to provide employment for the millions of people seeking work. However, higher land prices could counteract wanton consumption of land. Measures adopted by the Chinese government against erosion and desert encroachment include extensive reforestation. By 2010 it plans to have 20% of the landmass covered by forests again, up from 16.5% at present – an extremely ambitious target.

**Conclusion**

China faces enormous environmental challenges. A “business as usual” strategy would permanently curtail the country’s growth potential and make the environment even more of a constraint on economic development. Nor could the possibility of social unrest be ruled out. While determined action to halt environmental degradation in China would slow the pace of economic growth in the short term, it is the prerequisite to a sustainable growth trend in the long run. The country’s export engine could stall if the environmental and social standards on which production processes are based in China run counter to import regulations in the countries that buy its products.

Important regulatory framework conditions have already been put in place to upgrade the environment. Moving forward, it is a matter of improving implementation of the legislation in the various regions. Awareness must be created that it is better to prevent environmental damage in the first place than to have to remedy the situation later at considerable expense. Price signals are an important tool. The subsidies that currently still make low energy or water prices possible, for example, should therefore be scaled down more quickly. Price signals would also help people recognise the economic necessity for more environmental protection.

**Foreign capital and know-how are needed**

China needs foreign capital and know-how to cope with the tasks ahead of it; the government hopes that much of the investment will come from the private sector. Openings for foreign investors should therefore be deregulated further to create a competitive environment guaranteeing a level playing field for foreign and domestic competitors. Intellectual property rights and more legal certainty are fundamental to attracting more companies from abroad. Apart from the suitable technical expertise and financial clout, foreign companies wishing to enter the Chinese market will find a certain corporate size and familiarity with the specifics of the local market helpful.

**Huge scope for German companies**

German companies from the environment sector can bring their years of experience to bear when competing for orders in China. They benefit from Germany's ground-breaking role in environmental legislation. Another positive factor is the traditionally close ties between China and Germany in the environment sector. At the beginning of 2006, for example, the 2<sup>nd</sup> Sino-German Environmental Forum took place in Qingdao, at which fundamental avenues of cooperation were discussed and specific projects agreed on.

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Printed by: HST Offsetdruck Schadt & Tetzlaff GbR, Dieburg

Print ISSN 1612-314X / Internet and e-mail ISSN 1612-3158