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**China's Environment: Ambitions, Challenges and Opportunities for EU Cooperation**

**February 2014**

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| This project is funded by the European Union  | **logo stw**This project is implemented by a Consortium led by Steinbeis GmbH & Co. KG für Technologietransfer |

**1. Introduction: the challenge**

The past 30 years of rapid growth in China’s Reform Era produced a remarkable and sustained economic boom that lifted millions of people out of poverty. But the environmental costs of the “pollute first, clean up later” growth model have been severe. China’s people have seen a litany of ecological disasters. Official statistics for 2012 listed 542 “national environmental emergencies”. In 2013, some of the more visible examples included: the thousands of dead pigs that floated down the Huangpu River in Shanghai; a major toxic spill in Hebei province, which the local authorities covered up for five days; heavy bouts of smog in urban areas; a massive, deadly landslide at a gold mine in Tibet; and huge explosions in Qingdao, caused by leaking oil from a ruptured pipeline, which killed 66 people.

Longer-term trends of ecological deterioration have also continued. China has long suffered from water shortages, but this situation has worsened due to over-use and uneven distribution: 80% of the water is in southern China, but 65% of the farmland and over 50% of the people are in the north, where groundwater is then exploited to an unsustainable extent. From 2000 to 2009, according to government statistics, total water reserves dropped 13% and groundwater usage, which has doubled since 1970, now accounts for 20% of water usage. The water table under Beijing has dropped by 300 metres. This situation has been exacerbated by pollution. In 2012, 57% of the groundwater in 198 cities inspected by the Ministry of Environmental Protection (MEP), was found to be “bad” or “extremely bad” and more than 30% of the country's major rivers “polluted” or “seriously polluted”.

The annual assessment published by the MEP in 2013 said that the environment in China remains “grim” and reported a “marked deterioration in China’s air, water and land quality”. Environmental problems in the countryside had worsened, the report found, where mining, domestic waste, intensive livestock and fertiliser use are all major sources of pollution. Seven of China’s nine most important coastal bays had bad water quality and 25% of monitored lakes and reservoirs suffered from eutrophication. Only 27 of 113 key cities reached air quality standards. The same year, a major global scientific study reported that outdoor air pollution contributed to 1.2 million premature deaths in China in 2010.

Soil pollution, one of China’s most hazardous and politically sensitive environmental problems, due to its potentially huge effects on food security, was not included in the MEP’s assessment, despite estimates suggesting that up to 70% of China’s agricultural land may have been contaminated by industrial pollution and the over-use of chemical fertilisers. However, the Ministry of Land and Resources announced in late December 2013 that as much as 2.5% of China's soil – around 3.3 million hectares, about the area of Belgium – was so contaminated by heavy metals and other pollutants it could not be farmed.

Other major environmental pressures include those on biodiversity – 30% of the Yellow River’s fish species have been driven to extinction by dams, pollution and over-fishing, for example – and those caused or exacerbated by climate change. In 2007, China surpassed the United States to become the world’s largest emitter of greenhouse gases by volume. The following year, two-thirds of the total global increase in emissions came from China alone. As emissions of carbon pollution have fallen in Europe and the United States, China’s have continued to climb. In 2011, China’s CO2 emissions jumped by 9%, consistent with a 14.7% increase in thermal power generation, mostly from coal. China’s coal-fired power sector is now the world’s largest anthropogenic source of CO2 emissions. This means that while in the past, China’s per capita emissions had remained well below those of countries in the industrialised west, in recent years there has been a convergence: from 1990 to 2011 in China, CO2 emissions per capita increased from 2.2 to 7.2 tonnes, while they decreased across Europe from 9.2 to 7.5 tonnes per capita, according to the Netherlands Environmental Assessment Agency, putting the average person’s emissions in China and Europe roughly on a level.

Such dire assessments of the environmental situation are well understood by the Chinese public, as China’s environmental crisis increasingly becomes a social crisis too. Chinese citizens’ concerns about the environment rose sharply in 2013, according to a Pew Research Centre survey, which found that 47% considered air pollution a “very big problem”, up from 36% in 2012. Some 38% thought food safety was a major concern too.

Chen Jiping, a government official, said in March 2013 that the country now sees 30,000 to 50,000 so-called “mass incidents” or protests every year, of which the most common catalyst is the environment. As Chen put it, “If you want to build a plant, and if the plant may cause cancer, how can people remain calm?” In 2013, local authorities in Jiangmen, southern China, cancelled the construction of a US$6-billion uranium processing plant, after hundreds of residents took to the streets in protest. Similar demonstrations have become commonplace in Chinese cities over the past five years, and have successfully halted the construction of a petrochemical plant in Dalian, a copper and molybdenum refinery in Shifang, and incinerators in Guangzhou and Beijing.

In short, China faces a number of severe and complex environmental dilemmas, inextricably related to political and social issues, which if unsuccessfully navigated, may pose real threats to the health of people and the environment, as well as future prosperity, in China and the rest of the world.

**Ambition**

Many in China’s central government believe that environmental problems and natural resources depletion could endanger China’s development as an economic power, not least by threatening social stability through increasing environmental protests. Government assessments have found that climate change could affect agriculture, ecosystems, water resources, coastal zones and social and economic stability. China has thus committed itself to ambitious environmental goals. Sustainable development has been enshrined as a core state policy. China was the first developing country to adopt a national climate change plan, and its most recent push for an “Ecological Civilisation” has been accompanied by an ambitious raft of top-down environmental targets, regulations and policies in the 12th Five Year Plan running from 2011, including investments in low-carbon energy technologies and a nationwide carbon intensity (carbon dioxide emitted per unit of GDP) reduction target of 17% by 2015 on 2011 levels.

China also plans to invest 2.37 trillion yuan (around 290 billion Euros) in major energy saving projects from 2011 to 2015, which is expected to save the equivalent of 300 million tonnes of coal. China doubled its rate of growth of renewable energy capacity in 2013, reportedly installing more solar energy than any country has in a single year. The country is already the world’s largest producer of wind power, and has engaged in extensive environmental policy experimentation, including municipal and provincial carbon trading schemes. China has demonstrated long-term commitment to innovation, too: for the first time, it has overtaken Europe on the share of its economy devoted to research and development, according to the Organisation for Economic Co-operation and Development (OECD). In 2012, China invested 1.98% of its GDP into R&D, compared to 1.96% for the 28 member states of the EU. Core, long-term support for clean technologies is a key element of China’s ambition to move up the “value chain” towards a more efficient, high value-added development pathway based on the creation of “national champions” in high-technology sectors, such as low-carbon technology.

As the international community prepares for key UN-led climate talks in Paris in 2015, many European countries have seemed to downgrade their support for a transition to a cleaner economy: the UK government is split on the need for action on climate change; Norway has abandoned its development of carbon-capture technologies; and Spain has ceased its once-strong support for renewables. Hamstrung, polarised debates around climate change in countries like Canada, Australia and the United States bring little hope either, so China’s continued ambition on sustainable development goals might promise a new approach and a way through the deadlock. Furthermore, while a number of prominent western politicians and public figures cast doubt on the scientific case for climate-change mitigation or the need for political action, climate scepticism – either among the public or politicians – seems to be quite rare in China.

Basic climate-change knowledge is quite high among the Chinese public: a national telephone survey of 4,169 Chinese adults, using a combined urban and rural sample, conducted by the China Center for Climate Change Communication in 2012, showed that 93% of respondents knew at least a little about climate change. Of these respondents, 55% said that climate change was caused mostly by human activities; 55% said that they were worried about climate change; and 23% said they were very worried. Only 14% were not very worried and 8% were not at all worried. While occasional scepticism does emerge – sometimes in popular opinion, and even when Xie Zhenhua, then China's top climate-change envoy, said in 2010 that he was “keeping an open mind on whether global warming was man-made or the result of natural cycles” – it has had little bearing on the commitment to climate-change action, which has been incorporated into central economic planning and is understood at an elite level as a component of innovation and green growth.

**Prospects**

Whether this level of ambition will be successful in achieving a low-carbon transition is a more vexed question. Many of China’s environmental initiatives are long-standing – a number of environmental goals were integrated into China’s central planning in the 1990s, and officials first talked of avoiding the “pollute first, clean up later” model in the 1970s – but structural problems have tended to hobble the shift to a cleaner development path.

While China has many strong environmental laws on its books, in practice, this is no guarantee of their enforcement, and breakneck growth at all costs continues to be the main driver of environmental degradation, particularly at the local level. Collusion between polluters and local governments – where officials are still frequently evaluated on short-term GDP growth rather than environmental quality or adherence to green laws – often trumps environmental concerns. Recent low-carbon commitments are impressive, but closer scrutiny sometimes hints at the need for caution: in September 2013, for example, it emerged that only five solar-power vendors remained in a space built for 170, called ambitiously “Silicon Xinyu,” in Xinyu, Jiangxi province. In March, the major Chinese solar-panel manufacturer Suntech Power began bankruptcy proceedings. Perhaps most troubling, China is falling short on the high-profile 17% carbon intensity reduction goal under its 12th Five Year Plan, achieving only a drop of around 6% by the end of 2013.

Throughout the past decade, a number of officials and others have encouraged the growth of civil society in China to help supervise the implementation of environmental laws and regulations at the local level. Over the past 20 years, there has been a flowering of civil society, in the form of hundreds of thousands of registered NGOs, in addition possibly millions of unregistered NGOs, which exist in a legal grey zone. Many of these are environmentally focused groups, and many hope that a stronger, independent green lobby – not only comprising NGOs, but also legal defenders and an increasingly independent media – could help hold officials to account, and improve the enforcement of green laws and regulations. However, as the state of China’s environment has become an important cause of social unrest, responses from the Chinese authorities to citizens’ engagement with environmental issues have often become repressive and censorious.

China’s sophisticated system of Internet censorship is frequently used to silence environmentally focused dissent. Words like *sanbu* (“stroll”) – a euphemism often used by citizens to describe a street demonstration – are often deleted from micro-blogging websites when environmental protests are expected to occur. Truthful information leaked by whistleblowers, such as the blow-out of an oil well in the Bohai Gulf in 2010, which led to a 4,250-square kilometre spill, is often initially suppressed as a dangerous “rumour”. In September 2013, Dong Liangjie, a self-described “environmental expert”, was arrested as part of a nationwide “anti-rumour” crackdown. The co-founder of a water-purifier company, Dong had more than 3 million followers on Sina Weibo and had frequently commented on environmental issues, but police said many of his posts contained sensational or false information that exaggerated the problem of environmental pollution in China.

The distrust of non-state social organisations perceived to undermine government legitimacy seems to have intensified under China’s current leadership. Civil-society groups calling for greater rule of law, transparency and accountability – components of effective, rules-based environmental governance – have come under particularly intense pressure.

In November 2013, the Chinese Communist Party published its “Third Plenum” decision on the future direction of reform in China, which indicated a framework for policy development, upon which specific policies will be fleshed out over the coming years. While Xi Jinping’s key speech contained an encouraging nod to the notion that “mountains, water, forests, fields and lakes are a living community,” the conclusion – that this living community can only be protected through proper “management” – offered little indication of a substantive change in direction. There were also suggestions in the published resolution from the Third Plenum that political evaluation systems for officials should be reformed to take account of environmental costs, though again it will be important to see how such an agenda is expressed in concrete policy. Perhaps the most striking environmental statement in this document was the pledge to “draw red lines for ecological protection”, which referred to the establishment of “national park systems” to provide better protection for ecologically fragile areas, analogous to the “red line” protecting arable land for food security in China.

**International cooperation**

Might international cooperation – EU-China collaboration, in particular – help to overcome hurdles and spur greener development in China and the rest of the world? China’s participation in international environmental negotiations almost coincided with its admission into the United Nations in 1971: the influential environmental official Qu Geping attended the United Nations Conference on the Human Environment in 1972, in Stockholm, and later become the first head of China’s National Environmental Protection Agency, the forerunner of today’s Ministry of Environmental Protection. But more recently, China’s role in international cooperation on sustainable development has become controversial.

After the UN climate conference in December 2009 in Copenhagen reached only a limited agreement, which fell short of the legally binding deal many had hoped for, scrutiny came to rest on China’s role in the talks. Prior to the Copenhagen conference, the Chinese government had announced an ambitious, domestically binding target to reduce the carbon intensity of the economy from its 2005 levels by 40% to 45% by 2020. However, a sticking point in the negotiations at Copenhagen became how actions would be monitored in a future agreement, an issue usually referred to as “MRV”: measurement, reporting and verification. To the Chinese government’s chagrin, two widely read articles in the UK newspaper *The* *Guardian* – one by then UK climate secretary Ed Miliband and the other by the journalist Mark Lynas – were seen as having accused China and its allies of “hijacking” the conference to prevent a substantive deal being made.

During Copenhagen, Chinese official newspapers had published limited coverage that mainly reported senior Chinese leaders’ meetings with western diplomats. But in the aftermath of the conference, a more defensive line emerged regarding the country’s role: a number of state media articles analysed why the talks had apparently failed, claiming, for example, that the breakdown stemmed from western countries’ unwillingness to cooperate or share technological information. In direct response to claims that China had undermined efforts to reach a deal, a series of articles in the state media tried “to correct the distorted image that had been created by the Western media”. These presented a counter narrative of the last days of the conference, emphasising the then Premier Wen Jiabao’s constructive approach during the summit.

The details of this disagreement and the conflicting narratives that emerged – one common consensus about the talks is that Danish officials, in particular, had misunderstood the different speeds and styles of diplomacy between Chinese and international contexts – are less important than the consequences over subsequent years, during which a stand-off between the United States and China has increasingly dominated the narrative of international climate policy. Since the US domestic debate around climate change policy throws into question its capability to make serious international commitments, it is often proposed that the EU – perhaps leading a coalition of progressive developing countries – could help to break the deadlock and create a stronger deal. Certainly, EU-China projects on climate, energy and sustainable development – as detailed below – present some promising examples of constructive and pragmatic cooperation that might help to build international action on climate.

Furthermore, in the context of rising discontent and scrutiny of environmental policy in China, particularly around urban air quality in the aftermath of headline-grabbing periods of smog in Beijing and Shanghai, the need not only for low-carbon policies that have the co-benefit of reducing urban air pollution, but also for international experience on sustainable urbanisation and transport policies – something that the EU can help to provide – becomes all the more clear. Recognising this, it is worth first investigating more deeply how China’s environment is governed, and the roles of different laws, policies, institutions and actors.

**2. Plans and policies in China’s environmental governance**

As mentioned above, China’s environmental governance has a history that stretches back at least to China’s participation in the UN Stockholm conference in 1972. Twenty years later, China’s attendance at the UN Conference on Environment and Development, held in Rio de Janeiro, marked the beginning of a deepened official focus on sustainable development. Throughout the 1990s, sustainable development became a key phrase in government literature, with the 9th Five-Year Plan (1996-2000) the first to include the phrase. In 1997, China published its first *National Sustainable Development Report*. The 15th Party Congress, in September 1997, listed the “huge environmental and resource pressures caused by population growth and economic development” as major difficulties facing the nation.

In 2007, China’s National Development and Reform Commission (NDRC) published the first national climate-change plan of any developing country, setting out six principles: to address climate change within the broader framework of the country’s “national sustainable development strategy”; to follow the principle of “common but differentiated responsibilities”; to address both climate-change mitigation and adaptation; to integrate climate change-related policies with programmes for “national and social economic development”; to rely on technological advancement for effectively mitigating and adapting to climate change; and to “actively and extensively” participate in international cooperation on climate change.

In short, this made climate change an integrated part of economic planning, but not to the extent that it trumped other national objectives. Today, the 12th Five Year Plan is the most significant government plan to build on these principles and has enshrined action on climate change and sustainable development as state policy; but a number of related laws, regulations and policies also set the framework for China’s contested, fragmented environmental governance.

**Five-Year Plans**

Five-Year Plans (FYPs) are centralised and integrated national economic programmes, first introduced in the Soviet Union in the late 1920s, but later introduced by most communist states and several non-communist countries, including India. China launched its First FYP in 1953, four years after the founding of the People’s Republic. The plan emphasised rapid growth and increasing government control of heavy industry, and the government judged it to have been a success: iron, steel and cement production expanded significantly. The Second FYP, from 1958-1962, spanned the period of the Great Leap Forward and was marked by the push for ever more ambitious production targets, which due to catastrophic mismanagement and the diversion of agricultural labor into industrial production, led to famine on a historically unparalleled scale.

Similarly, attitudes to the environment during the Maoist period were marked by unattainable goals for construction, production and industrial expansion, characterised by what the American academic Judith Shapiro described as “dogmatic uniformity” and “utopian urgency” – arguably still risks today, where unfeasibly utopian models for environmentally friendly development are proposed – leading then to the disregard of ecological variations and limits across China’s vast landmass and highly unsustainable initiatives, such as the rapid building of thousands of small, shoddy dams for irrigation. (As an indication of the quality of this construction: by 1981, 3,200 of these dams had collapsed – 3.7% of all dams in China.) Mass relocations for state-backed infrastructure and development projects, and the political repression of critics of such approaches to the environment, together added up to what was often described, in explicitly militaristic terms, as a “war against nature.”

China’s Third and Fourth FYPs were the final plans of the Maoist era. They were followed by the Ten Year National Economic Development Plan Outline, from 1976 to 1985, which set the stage for a new period of rapid economic growth, known as the period of Reform and Opening Up, under Deng Xiaoping’s leadership. The rapid, unchecked development that followed – helped in large part through the devolution of power away from the centre to provincial and local government chiefs – came with such marked social and environmental costs that, for the first time, Five-Year Plans began to include measures to adjust economic growth targets downward, reduce energy and material consumption, slow population growth and improve environmental protection.

The Sixth FYP, from 1981 to 1985, included a national energy conservation program.

This trend toward a more sustainable model of development became clearer in the Eleventh FYP, from 2006 to 2010, which stressed a move away from the “getting rich first” model of often highly unequal development towards building a “harmonious socialist society” through support for more disadvantaged regions and sectors of society, as well as stronger environmental and energy-saving measures.

The 11th FYP’s measures to close small, inefficient plants were largely successful, as was the Top 1,000 Enterprises Programme for industrial energy efficiency and the Ten Key Energy Conservation Projects, though the most high-profile goal in the plan, to reduce the country’s energy consumed per unit of gross domestic product by 20%, faltered in the last few months of the plan, with some localities reportedly cutting power supplies to factories, traffic lights, and even hospitals in a late rush to meet the target; China ultimately achieved a 19.06% energy intensity reduction over the Eleventh FYP.

**12th Five-Year Plan (FYP)**

The 12th FYP, for 2011-2015, contains both binding and flexible environmental targets and a number of specific sectoral plans have also been devised for various polluting industries such as steel, nonferrous-metals, building materials, chemicals, electricity, coal, paper, printing, dyeing and tanning.

Of the 12th FYP’s many targets, one-third concern resources and the environment, including the following binding targets for 2015:

* Non-fossil fuel to account for 11.4% of primary energy consumption;
* Water consumption per unit of value-added industrial output to be reduced by 30%;
* Energy consumption per unit of GDP to be reduced by 16%;
* Carbon dioxide emissions per unit of GDP to be reduced by 17%;
* Forest cover to rise to 21.66% and forest stock to increase by 600 million cubic metres;
* Chemical oxygen demand (a measure of water pollution) and sulphur dioxide to be reduced by 8% (targets that were also in the 11th FYP) and ammonia nitrogen and nitrous oxides by 10% (new targets).

The plan also puts an emphasis on economic upgrading toward higher-technology and more efficient growth, through an emphasis on innovation in clean energy, new materials, green transportation, biotechnology and more. The 12th FYP established seven new “strategic industries” supported by central government through preferential fiscal and financial policies: new energy, energy conservation and environmental protection, biotechnology, new materials, new information technology, high-end equipment manufacturing and clean energy vehicles.

Another important element of the 12th FYP is the Top-10,000 Energy-Consuming Enterprises Program**,** an expansion of the Top1,000 Energy-Consuming Enterprises Program in the 11th FYP (2006-2010, which reportedly saved more than 400 million tonnes of CO2 through the diffusion of energy-monitoring tools and technical support for the top 1,000 energy-consuming industries in China.) The current programme focuses on Chinese industrial enterprises that use more than 10,000 tonnes of coal equivalent per year, as well as transportation companies, public buildings and hotels and commercial enterprises consuming more than 5,000 tonnes of coal equivalent per year.

A number of policy proposals under the current FYP have been fleshed out in recent years, and are discussed below. However, by the end of 2013, China had only reached a 6% drop on either its 17% carbon intensity reduction target or its 16% energy intensity reduction target, making enforcement concerns – and the related recommendations for more effective implementation, and the role of international cooperation – all the more relevant.

**Laws and regulations**

Since the start of the Reform Era in 1979, around 10% of the legislation passed by China’s National People’s Congress has been related to environment and energy. Key early legislation included the *Environmental Protection Law* (1979), the *Water Pollution Law* (1984) and the *Air Pollution Law* (2000). Other relevant laws include:

* The *Evaluation of Environmental Effects Law* (2002), designed to underpin the inclusion of environmental matters in economic and social decision-making processes, specifying the implementation of “sustainable development strategy, to take precautions against adverse effects on the environment after implementation of plans and completion of construction projects, and to promote the coordinated development of the economy, society and environment”;
* The *Environmental Impact Assessment Law* (2002), intended to “identify any adverse environmental consequences of a development action.” Significantly, it is one of the few Chinese laws to specify the need for public consultation. However, this consultation takes place only at a late stage, after the impact assessment has been completed and before it is approved. Furthermore, the full assessment does not need to be disclosed to the public, and only an abridged version is typically made available. Perhaps most problematically, where companies do not complete an EIA, the law only compels them to complete the approval process retrospectively, after they have broken ground. Only firms that do not complete this late, “make-up” assessment face being fined, and the maximum fine is 200,000 yuan (around 24,000 Euros) – a small fraction of the revenue generated by many large projects;
* The*Law of the People's Republic of China on the Promotion of Clean Production*(2002), intended to “infuse cleaner production into plans and programs for national economic and social development, as well as environmental protection, resources utilisation, industrial development and regional development.” A 2012 amendment stipulated an increase in capital input from the central government into cleaner production and its better enforcement through the promotion of evaluation and supervisory systems for local authorities. China’s Ministry of Industry and Information Technology has also published guidelines for the implementation of the clean production law, covering specific sectors including cement and electroplating;
* The *Renewable Energy Law*, introduced in 2006 and last amended in 2010. The law intends to promote “the exploitation of renewable energy” as well as an improved “energy structure,” environmental protection and the “sustainable development of the economy and society”. Despite significant progress in the development and installation of renewable energies in China, grid connectivity remains a significant problem, which China aims to address in its draft *Energy Quota Law*, to be implemented in 2015, which would commit grid operators as well as provincial governments to the goal of 15% of electricity generated from renewables;
* The *Circular Economy Promotion Law*, enacted in January 2009. The law defines “circular economy” as a “generic term for the reducing, reusing and recycling activities conducted in the process of production, circulation and consumption.” The law focuses on three levels: the micro, or enterprise level, where businesses should modernise their facilities, with the aim of achieving cleaner production, supervised through special audits; the meso, or regional level, which promotes the construction of “eco-industrial parks” for groups of enterprises to make “comprehensive utilisation of resources so as to promote the development of circular economy”; and the macro, or city level, which encourages cities, municipalities and provinces to coordinate the production and consumption of material and its associated energy flows; and
* The *Open Governmental Information Regulations*, implemented in 2008 and, as operationalised in a specific decree from the Ministry of Environmental Protection in the same year, *The Environmental Information Disclosure Decree*, should increase government transparency and administrative performance by decreasing “information asymmetries” among actors involved in environmental protection, through encouraging the proactive disclosure of environmental information and giving citizens the legal right to request disclosure of environmental information. However, in practice, many of the most sensitive and critical types of environmental information – such as data on soil pollution, hazardous waste disposal and environmental impact assessments – are not disclosed. This is partly due to the reach of China’s state secrets law and use of a catch-all provision in the regulations, which permits refusal where information may “endanger state security, public security, economic security and social stability”, and partly due to poor implementation: many refusals are not even lawful – disclosure requests are simply refused without explanation.

Other environmental laws cover forestry, fisheries, wildlife protection, marine areas, desertification prevention, clean production, solid waste and energy. China’s *Environmental Pollution Liability Insurance* scheme is an important example of a market-based mechanism piloted recently as an alternative approach to command-and-control environmental measures, which is expected to be fully implemented in 2015.

Similarly, carbon cap-and-trade schemes were introduced in voluntary form in 2009 in Shanghai, Tianjin and Beijing. Building on these experiences, in June 2013 a larger cap-and-trade programme was launched in Shenzhen, covering more than 600 companies and 38% of the city’s overall emissions. Shanghai and Beijing followed suit in November. Payments for eco-systems services schemes have been introduced at the local level to channel finance toward otherwise-uncompensated “services”, such as forest protection by farmers in north-eastern China.

One environmental law expert, Peking University professor Wang Jin, has argued memorably that China’s “green laws are useless.” Although China has many environmental laws on the books, Wang observed, their enforcement provisions are often weak, and the legal system is underdeveloped and hobbled by political interference. Chinese laws are often vague and are more akin to policy statements: many “encourage” rather than “require” specific steps to be taken.

According to academic Alex Wang, this is well understood by Chinese environmental officials, who have openly acknowledged that such weaknesses result from compromises in the legislative process—compromises driven by concerns about limiting China’s economic growth. However, it is not only the quality of legislation that affects China’s environmental situation, but the structural challenges that can be better determined by examining the many institutions, actors and structures that govern the environment in China.

**3. Institutions and actors in China’s environmental governance**

Environmental policies and plans are of little use if they are not enforced, and understanding China’s enforcement challenge means grasping the contours and relationships of its complex, vertically and horizontally fragmented environmental governance structure. So, who are the key players in Chinese environmental governance?

**Central government**

The National People’s Congress (NPC) is, in formal terms, the Chinese government’s uppermost decision-making body. It enacts and revises the country’s laws, its constitution and enforces its “basic laws”. In practice, it is commonly described as a “rubber stamp” entity, with its powers highly circumscribed. The NPC meets in full session once a year, and it also has a number of executive bodies, including its own Committee for Environmental Protection and Natural Resources Conservation.

The permanent Standing Committee of the NPC is responsible for the interpretation of the constitution, supervision of its enforcement and the introduction of laws other than basic laws, including the *Environmental Protection Law*, which is currently being revised. The NPC Standing Committee also governs the State Council, an executive body chaired by Premier Li Keqiang, which co-ordinates government ministries, issues administrative rulings and, in effect, helps to bind the Chinese Communist Party (CCP) with the central government.

In theory, the most important central government institution focused on environmental issues is the Ministry of Environmental Protection (MEP). In March 2008, China’s State Environmental Protection Administration was “upgraded” to become the MEP. The MEP is the main governmental body responsible for the implementation of national policies and plans on the regulation of air, water and soil pollution, noise pollution, solid waste, toxic chemicals and vehicle emissions, as well as the marine environment and nuclear safety. The MEP also drafts laws and regulations and issues administrative rules for environmental protection.

This is a considerable set of responsibilities for an organisation that only employs around 320 people. However, its tasks also overlap considerably with state planning and financial institutions, such as the State Scientific and Technological Commission, which is responsible for the implementation of China’s Agenda 21, the State Economic and Development Commission, the Development Research Center and, most prominently, the National Development and Reform Commission, (NDRC).

The NDRC is China’s top economic planner and has become particularly important in the environmental sphere due to its role in energy saving and emissions reduction policies – and in no small part thanks to its ambitious vice-director Xie Zhenhua, who left SEPA after a major chemical spill in 2005, and served as China’s chief negotiator at Copenhagen. The NDRC describes its environmental roles as to “coordinate the implementation of plans and policy measures for a recycling economy, national energy and resource conservation and comprehensive utilisation” and “to participate in the formulation of plans for ecological improvement and environmental protection”.

The departments of the NDRC that deal with environmental issues are the Department of Resource Conservation and Environmental Protection, the Department of Climate Change and the National Energy Administration, all three of which coordinate the implementation of national policies. The Department of Resource Conservation and Environmental Protection coordinates the work with the environmental protection industry and the development of a “circular economy” in China. Together with the Department of Climate Change, which is responsible for the implementation of the United Nations Framework Convention on Climate Change, the Department of Resource Conservation and Environmental Protection assist the National Leading Group (see below) in charge of Climate Change, Energy Conservation and Emission Reduction.

The MEP’s roles also overlap with other ministries, including: the Ministry of Land and Resources, whose environmental roles include overseeing the conservation and sustainable use of natural resources and defending the “geological environment”; the Ministry of Water Resources, which oversees the conservation of water resources, flood control and prevention of soil erosion; the Ministry of Agriculture, responsible for developing ecological agriculture and sustainable agricultural development and protecting the water quality of fisheries; the Ministry of Housing and Urban-Rural Development, which develops construction standards and is responsible for “building an environmental infrastructure”; and the National Health and Family Planning Commission, which is involved in monitoring the quality of drinking water and other environmental issues that affect health.

Given these overlaps between ministries and other elite, bureaucratic units, the central government establishes National Leading Groups as inter-ministerial organs to coordinate work on cross-jurisdictional issues. These leading groups are typically highly powerful policy-making units, whose discussions will often precede and trump those happening in the ministries or other decision-making bodies and bypass bureaucratic holdups. Thus in 2007, China established the National Leading Group for Climate Change and the State Council Leading Group for Energy Conservation and Emission Reduction to help co-ordinate these cross-cutting issues.

The central government also supports and encompasses a number of environmental institutions and actors whose roles might be less clearly defined but can be influential, particularly in policy advice. These include “government-organised non-governmental organisations”, or GONGOs, think-tanks and government-linked academies. The All China Environment Federation (ACEF) is China’s main environmental GONGO, which purports to function as a “bridge” between society and government in environmental decision-making, for example by helping NGOs to legally register. Currently, the future role of ACEF is under scrutiny, since a draft of the revised *Environmental Protection Law* lists ACEF as the single institution that would be permitted to file environmental lawsuits in Chinese courts, a measure opposed by environmental groups that support the greater development of public-interest law and citizen participation in environmental decision-making. The MEP has also established the Environment Education Centre as a GONGO to support grassroots, unregistered NGOs to work as its branches, enabling them to participate in government meetings and training workshops (see more under “Public Participation” below).

Government-linked experts, especially those associated with government think-tanks, such as the Chinese Research Academy of Environmental Sciences (CRAES), the Chinese Academy of Sciences (CAS) or the Chinese Academy of Social Sciences (CASS), have also played a significant role in the drafting of China’s environmental policies, plans, laws and regulations. The China Council on International Cooperation on Environment and Development (CCICED), under the State Council, is one example of a long-standing consultative think-tank in the environment arena, which pioneered cooperative research projects with teams of international scholars. Policy advisors are more than just information providers, but frequently can influence political decisions to favour their particular institutions or research agendas. Thus, personal ties can sometimes become as important as institutional linkages or academic reputations or expertise.

This proliferation of overlapping institutions at the central level indicates the vertical fragmentation of China’s political system and its effect on environmental decision-making. Rather than the monolithic, authoritarian system often imagined as characteristic of such a party-state, Chinese environmental governance at the central level is characterised by time-consuming political bargaining between elite bureaucratic units, as well as factional conflicts within the CCP. Policy decisions are thus frequently shaped by the narrow goals of various elite agencies.

In what are best described as “regulatory grabs”, government organisations with no previous involvement in, or explicit authority over, a particular environmental issue, are known to assert authority unexpectedly, adding to the confusion. Furthermore, the tendency to prioritise GDP growth over environmental regulations means that organisations such as the State Economic and Development Commission frequently trump the MEP in disputes, for example, over large infrastructure projects.

**Local government**

At the level of China’s provinces and municipalities, local People’s Congresses are permitted to introduce local regulations, as long as they do not contravene the constitution or national laws and regulations. Local governments can also issue local administrative rulings in order to implement national laws and regulations. Environmental programmes and policies that have been developed at a national level will thus be further specified in the process of implementation at a local level, with the establishment of local leading groups, headed by local officials such as mayors and vice-mayors. However, in theory it is the Environmental Protection Bureaus (EPBs) that represent the MEP at the local level and are the most important local actors in Chinese environmental governance. They are supposed to oversee the implementation of environmental standards and environmental impact assessments, and their judgments can help to determine the scope and direction of regional investments and developments.

In practice, EPBs are known for their limited enforcement capacity. Significantly, they are not financed by the MEP, but by local governments. EPBs’ budgets are subject to approval by local finance bureaus and they receive additional money from pollution discharge fees. EPBs can vary a great deal from province to province in their internal organisational structures, but a variety of local actors and institutions will typically influence their work; these include the local Party Secretary, the local Development and Reform Commission, the local Economic Development Commission, the local Planning and Construction Bureau, the local Agriculture Bureau, the Water Resources Bureau and even the managers of local State-Owned Enterprises, who will often politically out-rank EPB directors.

Recognising this, six regional Supervision Centres for Environmental Protection have been established in Nanjing, Guangzhou, Xi’an, Chengdu, Shenyang and Beijing. These are supposed to supervise and inspect the enforcement of national environmental laws and regulations on behalf of the MEP, with a special focus on cross-provincial regional and river-basin environmental problems. They have no authority to impose sanctions or penalties, but function more as information providers and dispute-mediating agencies.

In effect, structures of local government mean that the vertical fragmentation described above is matched by horizontal fragmentation too: a complex arrangement often described by the Chinese metaphor *tiao kuai* (“branches and lumps”). This gap between environmental policy, law and regulation, and implementation, is often understood to stem from the central state’s lack of capacity to implement environmental policies in the context of the decentralisation first introduced in the early Reform Era.

Local authorities largely depend financially on local taxes. The need to maintain tax contributions from enterprises is thus often an incentive to turn a blind eye to enterprises that pollute or break environmental laws. In effect, this creates a protectionist local alliance of developers, polluters and officials – sometimes also supported by sections of the wider public, especially when jobs depend on it – which often tips the balance away from environmental enforcement and towards the interests of local polluters.

Regulators funded by local government are thus co-opted into this alliance in a phenomenon known as “regulatory capture”: for example, since the EPBs are financed by local government, they often end up acting in the interests of the very institutions they are tasked with regulating. Research has shown that most officials in charge of EPBs do not rise up from within the environmental bureaucracy, but have held positions in other sectors, indicating the preference their paymasters have for less experienced or aggressive environmental regulators.

Thus, while China’s central government has championed the end of the “pollute first, clean up later” model of development, in practice local officials are often subject to conflicting pressures. This is not restricted to the question of local revenues and taxes: in many cases, through its economic targets for officials, the central government provides better incentives for local governments’ non-implementation or poor implementation of environmental policies than it provides for full implementation. Growth targets are particularly important in political evaluation: GDP growth is often the most important benchmark for the careers of local officials, forming an important aspect of the annual “work summaries” used to assess CCP cadres, through the cadre responsibility system. This means that high-profit, rapid developments are often favoured politically, even where they might contaminate the environment and break national environmental laws. However, increased attention to public opinion and rising concern about environmental incidents may be changing this calculus for officials – at least in some high profile cases, if not across the board.

Disclosure of municipal air quality is a particularly encouraging example: in late 2011, Beijing suffered particularly severe air pollution, but official monitoring data only indicated that the air was “slightly polluted”; the government claimed to have met its targets for “blue sky days”. This stirred up a major controversy online, because the hazardous, microscopic particulate matter known as PM 2.5 was being collected but not reported in the Ambient Air Quality Standards. Independent air quality measurements, including those published by the US Embassy on its Twitter account, confirmed the high levels of PM 2.5. The online uproar became so significant that the leadership intervened. In November 2012, for example, then Premier Wen Jiabao said that monitoring standards for environmental quality should be improved to reach international standards. Today, PM2.5 is among those pollutants automatically disclosed in real-time in 179 Chinese cities, including Beijing. But the degree of pressure produced by the controversy around Beijing’s smog was not typical. Establishing effective enforcement of environmental regulations requires consistent supervision from above and below – particularly below.

**Public participation**

Given the local implementation deficit in environmental regulation and the sustained inability of the administrative system to monitor and guide environmental management, some policymakers – particularly those in the MEP – have advanced the idea that central government should support public participation to supervise and monitor implementation and enforcement through social pressure. Thus, certain channels for public participation have been opened and insitutionalised through regulations and measures such as the *Environmental Impact Assessment (EIA) Law* (2002), *Administrative Licensing Law* (2003) and *Temporary* *Measures for Public Participation in Environmental Impact Assessment* (2004) – which stipulated that “construction units [and] EIA agencies authorized… should take public opinions seriously” – though the implementation of such rulings have been patchy.

Methods for public participation in China include expert consultations, seminars and perhaps most importantly, public hearings. Public hearings can be held in China during the preparation of EIAs, the issuing of licenses for proposed construction projects, the issuing of some administrative penalties for environmental violations and where new environmental legislation is proposed. There are no detailed instructions for the conduct of hearings, and in practice, their use is rare. However, the first use of a public hearing, which helped to shape today’s environmental movement in China, illustrates also the importance of the role of enterprising officials in advancing sustainable development agendas in China by harnessing pressure from civil society. Pan Yue, a vice-director at SEPA (now the MEP), who had already established a name for himself in 2004 by unleashing a “storm” of suspensions on around 30 industrial projects that had dodged their EIAs, forced a public hearing in 2005. This ruled that Yuanmingyuan Park, site of the Old Summer Palace, should remove the plastic lining of an artificial lake, which had been laid without proper approval, and that environmentalists said would damage biodiversity and deplete groundwater levels.

Pan Yue, who became one of China’s most outspoken officials – telling *Der Spiegel*, for example,that China’s economic “miracle will end soon, because the environment can no longer keep pace” – has since been sidelined, thanks to a corruption probe into one of his staff, part of a web of complex, factional intrigue. But his promotion of citizen engagement in environmental decision-making helped to change environmental governance in China. While public hearings are still uncommon, polling is one way that local governments gauge local public opinion on environmental issues, as is analysis of feedback on social media. Hotline 12369, a phone tip-off line for citizens to report pollution incidents and environmental violations, operated by the Ministry of Environmental Protection, can also help the public to supervise the enforcement of environmental regulations. Furthermore, the flourishing of green NGOs, both registered and unregistered, has helped to institutionalize new actors in environmental decision-making.

China’s first legally registered environmental NGO, founded in 1991, was a bird protection society in the country’s north-east. But Friends of Nature, registered under the Ministry of Civil Affairs in 1994, survives to this day as the largest green civil-society organisation in China: one of at least 492,000 legally registered social organisations in China, according to a 2012 government report, of which many are green groups. Oft-cited victories for this burgeoning environmental movement include the shelving in 2004 of a plan to build a cascade of 13 dams on the Nu River, in southwest China, after a sustained media and NGO campaign against the project and the hitherto unprecedented intervention of the then Premier Wen Jiabao. But since then, the environmental movement and the NGO sector have developed in a number of directions.

On the one hand, the 12th Five Year Plan put an emphasis on “social management”, an ambiguous term that often refers to the development of rules for social organisations – either to manage social discontent, or to make registration easier for grassroots groups. Under government regulations, including the *Provisional Regulations for the Registration and Management of Popular Non-Enterprise Work Units* (1998), three types of social organisation are permitted: “social groups”, which are similar to membership organisations; “popular non-enterprise units”, which cover many NGOs and charitable service-delivery organisations; and “foundations”. Today, social organisations that provide social services, such as rural education, have been encouraged to register and are not managed closely. Advocacy-oriented groups and those funded from abroad – which can include environmental groups, though religious and political groups are deemed even more sensitive – tend to be closely monitored by state authorities.

At the same time, a notable flowering of environmental activism has occurred over the past decade outside of the NGO sector entirely, driven by social media and other networking, typically among the newly urbanised middle classes. China has 591 million Internet users and more than 460 million mobile Internet users, according to the China Internet Network Information Center. Since a touchstone, successful case of urban protest in 2007 against a factory manufacturing the petrochemical paraxylene (known as PX) in Xiamen, south-eastern China, micro-blogging and online messaging has frequently been used to organise protests against polluting projects, waste incinerators and infrastructure projects, often without NGOs – or indeed any institutionalised channels for public participation.

Such protests – which included those against a maglev train route in Shanghai in 2007,a petrochemical plant in Sichuan province in 2008, and more recently a copper refinery in Shifang, Sichuan, in 2012 and a PX project in Kunming in 2013 – have typically focused on the lack of transparency and accountability around potentially polluting projects, where planning processes have moved forward without full public participation or information being disclosed about the approval process. Without participation or open information it is almost inevitable that public suspicion of development projects is high in China. In the absence of effective institutional channels for social disagreement around the planning process, it is unsurprising that such concerns frequently lead to conflict. Recent crackdowns on “rumours”, Internet censorship and government distrust of social media all indicate an unwillingness to incorporate public feedback where conflicts may arise around environmental decision-making.

There are also, however, encouraging examples of grassroots innovation in campaigning: in response to the PM2.5 controversy, a group called FLOAT Beijing attached Bluetooth-enabled pollution sensors onto kites, creating an online air pollution dataset in the process, which could challenge official narratives regarding air quality. The environmental NGO Green Beagle also organised residents to use home-testing kits and post their own air-pollution readings online. For a number of years, the Institute of Public and Environmental Affairs (IPE), founded in Beijing by Ma Jun, a former investigative journalist, has collected publicly available information to create online maps of air and water pollution and other environmental data, which citizens can use to find the sources of pollution near them and many international businesses, including those in the IT industry, have used to better understand the impacts of their supply chains.

This emerging area of civil-society innovation and public participation is also one in which Europe could offer some perspective and experience through sensitive and careful cooperation: policy development around planning and participation processes in Europe have led to the consensus that the public should be informed about new developments at the earliest juncture and permitted to engage meaningfully in environmental decision-making, offering the opportunity to turn potential public hostility into involvement and support – and allowing the evaluation of alternative plans. Methodologies and policy frameworks around these sorts of issues could be shared with Chinese partners, as could work around open environmental information – such as that pioneered by the European Environment Agency’s Eye on Earth – which could help to develop more robust systems for public participation and the reliable and accessible information on which it depends. But what examples of international cooperation between China and Europe already exist, and where might more be identified?

**4. EU-China cooperation**

There exist many Europe-China projects for collaboration on environmental issues, covering a range of sustainable-development challenges. This report identifies three main areas in which EU-China research and cooperation on environmental themes has been particularly productive, or could continue to be in future: civil society, sustainable urbanisation and green economy.

**Civil society**

Europe has valuable experience of the legal infrastructures, institutional mechanisms and practical skills that can help create more effective public participation in environmental decision-making – participation that can help China to create greater social peace and public acceptance of development decisions, as well as more sustainable, environmental choices in policymaking. This is a challenge that the relatively well-developed NGO sector in Europe can help to address, particularly in collaboration with foundations, universities and policymaking institutions, such as think tanks.

The EU-China NGO Twinning Programme is a successful example: anexchange programme for staff from European and Chinese NGOs, with the objective of “establishing sustainable relationships and cooperation between non-governmental or non-profit organisations and think tanks from both regions”. The programme, run by Germany’s Stiftung Asienhaus, with support from the Robert Bosch Stiftung, brings together 20 European and Chinese NGOs working on climate change, environmental protection, fair trade and sustainability. Ten exchange fellows from European NGOs are twinned with 10 fellows from Chinese NGOs, who take part in a work and study programme for four-to-eight weeks in each other’s organisation.

In 2013, one encouraging pilot exchange twinned a junior researcher from the China Youth Climate Action Network (CYCAN) with a project leader from German environmental group Heiße Zeiten in Dusseldorf for 10 weeks, producing new insights into climate and environmental dialogues in each other’s countries and creating potentially valuable connections for future cooperation. More recent projects include Dutch and Chinese environmental NGOs twinning to learn about “green credit” policies in each other’s nations, and a public interest law institute from Hubei province partnering with a legal charity in the United Kingdom.

A similar spirit of exchange underpinned the **EU-China Civil Society Dialogue on Participatory Public Policy, a programme that ran from 2011 to 2013, building on the EU-China Civil Society Forum**, which ran from 2008 to 2010. The Dialogue was **endowed by the European Union and brought together the University of Nottingham’s China Policy Institute, the University of Nottingham Ningbo, the Institute for Civil Society at Sun Yat-sen University, the China Association for NGO Cooperation, the Great Britain-China Centre, the Global Links Initiative, the Germany Asia Foundation and Leadership Inc. A series of bilingual dialogue events in Germany and China, which convened academics and practitioners from civil society in China and Europe to discuss shared challenges and potential collaborative projects, covered themes of social entrepreneurship, industrial pollution and environmental health, climate change and sustainable consumption and production, community building and grassroots NGOs, low-carbon economies, food safety and information disclosure.**

For Chinese environmental NGOs, such projects help to support capacity building and professionalisation, particularly in management, and to facilitate greater learning about concepts of civil society beyond China – both desires that are commonly expressed by Chinese NGO activists. For European NGOs, such programmes offer a rare glimpse of Chinese civil society, and the opportunity to forge long-lasting links for deeper cooperation in future. Other avenues for civil-society cooperation, outside of the NGO sector, include journalism training: in the past decade, a number of European foundations, NGOs and development agencies have prioritised capacity building for Chinese journalists covering climate-change issues, in the hope that a better informed public conversation about climate change can help advance cooperation.

For example, the British Council, supported by the UK government, has organised climate-reporting training sessions in Beijing, Shanghai, Guangzhou, Chongqing and other cities; established an award for climate-change reporting; put online two training modules for media, an introduction to climate change and a guide to international negotiations; and sent journalists to the Copenhagen climate change conference. Further avenues for work on these themes exist. European funders could still help journalism training in China to move away from a didactic mould towards more innovative and participatory models, while training schemes could improve journalists range, allowing under-reported topics and regions to receive better coverage. Chinese journalists could also draw on European reporters’ experience of linking complex scientific stories to everyday events and controversies. On this theme, journalists could exchange opinions productively regarding environmental spheres other than climate: Europe’s long-running controversies around the development of genetically modified food crops and nuclear power, for example, could be instructive from a communications and civil society point-of-view.

**Sustainable urbanisation**

After 30 years of rapid urbanisation, China’s city dwellers outnumber its farmers. Today around 52% of China’s people live in its cities. By 2025, the Chinese government plans for this figure to rise to 70%. This shift has so far not only created a raft of complex and unenviable problems for social and economic planners, but it presents a number of pressing environmental questions. How will 250 million newly urbanised citizens travel to work, heat their homes, have enough water for daily life or dispose of their waste? Such design and planning questions will have profound consequences for China’s development – and particularly, its efforts to rein in its greenhouse-gas emissions, air and water pollution. European cities might therefore offer valuable models of how to develop more sustainably and avoid locked-in, high-carbon development pathways.

Recognising this, a high-level summit in Beijing in February 2012 led to the creation of the China-EU Partnership on Urbanisation, which aims to promote exchanges and cooperation on sustainable urban development. Consequently, a number of flagship cooperative projects have centred on these questions: how in the context of rapid urbanisation in a warming world, European governments, academics and civil society can cooperate with China on themes that include migration, social services, civil society, urban planning, strategies for low-carbon development and resilience, disaster preparedness, capacity building for decision makers, eco-cities, sustainability indicators, district heating and cooling, green buildings and retrofitting, mass transit systems, electric mobility, digital cities, circular economy and urban air quality. The EU-funded URBACHINA research project, for example, on “Historical and Comparative Perspectives, Mega-trends towards 2050”, has convened 11 Chinese and European research institutions to analyse China’s urbanisation trends over the next four decades and understand possible future scenarios for urban sustainability, with a special focus on how policy-makers might better understand sustainability issues through strengthened China-EU institutional collaboration. Case studies include: Shanghai, Chongqing, Kunming and Huangshan, and the project publishes open access articles, blogs and a weekly newsletter.

More specifically aimed at offering Chinese experts a source of reference for designing municipal policies, the Chinese European Training on Regional Policy (CETREGIO) project on urban-rural linkages brought together 100 Chinese delegates for a two week training course in Europe, including interactive classroom teaching in Germany and field visits to Luxembourg, Belgium and Poland. Similarly, “Germany and China – Moving Ahead Together” organised a series of events in six Chinese metropolises: Nanjing, Guangzhou, Chongqing, Shenyang and Wuhan, which culminated at the Shanghai Expo in 2010, promoting partnerships and cooperation on sustainable urbanisation between Germany and China. The Shanghai Expo also provided the focal point for “Chinese Ecocities and Sustainable Buildings for the Future”, a project by France’s Scientific and Technical Centre for Building (CSTB), working in collaboration with Shanghai municipality and China’s Ministry of House and Urban-Rural Development (MOHURD). This focused on the creation of an “Eco-Home” prototype housing unit and the development of a Chinese handbook on sustainable urban development “Cities and Forms – on sustainable urbanism”.

China’s export-oriented economy in recent decades has meant its most rapid and dense urbanisation has been along its eastern seaboard, and the country now has the world’s largest population living in low-elevation coastal zones*.* Disasters are already located disproportionately in these low-lying areas around the world, and climate change may exacerbate this trend. Stronger tropical storms could lead to flooding and storm surges, and rising sea levels can increase the damage from floods. Climate resilience, in the context of cities, therefore, should include disaster response and preparedness. The EU-China Disaster Risk Management Project stems from a programme of civil assistance established after the Sichuan earthquake in 2008, funded by the EU’s Development Cooperation Instrument (DCI). A joint project is currently underway which aims to improve disaster preparedness and post-disaster management through regular exchange, capacity building and other measures.

Other aspects of sustainable urbanisation include the development of low-carbon pathways that include multiple stakeholders and careful attention to policy development. These particular themes are seen in the work of the Sino-European Partnership on Low Carbon and Sustainable Urban Development: a cooperative project realised by the German NGO Germanwatch and the London-headquartered think-tank E3G, funded by Stiftung Mercator. This has established a city partnership between Bonn and Chengdu, which provides a framework for dialogue and exchange – including multiple stakeholders – on targets for reducing carbon intensity, incentive schemes for low carbon development and regional emissions trading schemes. Europe has also provided assistance to China in its efforts to establish pilot carbon trading schemes in eight cities and five provinces under the 12th Five Year Plan through the EU-China Emissions Trading Scheme project.

In November 2013, the EU-China Urbanisation Forum in Beijing kept these themes high on the EU-China policy agenda. This forum saw the launch of the Europe-China Eco Cities Project, with funding from the EU and German development agency GIZ, which provides a virtual knowledge hub for Chinese mayors. This should help provide technical assistance to MOHURD in order to achieve the targets set out in the 12th Five Year Plan on environment, energy and carbon-intensity, as well as to share experience and best practices on sustainable urbanisation and other policies between Europe and China.

Pilot eco-districts and “eco-cities” have been particularly high profile and popular options for international cooperation on sustainable development. These include Denmark’s support for the Zhangjiagang Sino-Denmark Eco-City; Finland’s Danyang DigiEcoCity, in Jiangsu province, and Gongqing DigiEcoCity, both in Jiangxi Province, and the Mentougou Eco-Valley Project Master Plan in Beijing; the “Sino-Swedish Tangshan Bay Eco-city development”, “Wuxi Sino-Swedish low-carbon eco-city” and “Beijing Sino-Swedish Eco town planning and development” projects; France’s support for economic and commercial cooperation in the field of eco-districts in Chongqing and Shenyang, under a cooperation agreement between the French and Chinese ministries of finance; and the Netherlands’ Sino-Dutch cooperation framework for the “Eco-2-City” low-carbon City project in Shenzhen.

Germany also supports research into low-carbon urban systems for energy efficiency and carbon reduction, including in transport, housing, work and recreation, in Shanghai’s Hongqiao district. Addressing the role of small and medium-sized enterprises and local governments in mitigating climate change, a project implemented by the Wuppertal Institut focused on sustainable public procurement in urban administrations, working with governments and SMEs in the provinces of Gansu and Hebei and the city of Tianjin.

Beyond city-level plans, a number of schemes provide technical and other assistance in the deployment of district heating and cooling, green buildings and retrofitting: the EU-China Trade Project has funded workshops on energy-performance certificates in buildings and more. The Europe-China Clean Energy Centre also works on energy-efficiency and the integration of renewable energy in building. The French Development Agency (AFD) supports work on combined heat-and-power in Taiyuan and Jinzhong, in Shanxi province, and thermal retrofitting of public buildings in Wuhan. Germany has supported the construction of an energy efficient show house in Shenyang, at Shenyang Jianzhu University, and the Italian Ministry for the Environment has promoted the development of sustainable architecture and building through the Sino-Italian Environment and Energy Efficient Building at Tsinghua University and schemes for new *hutong* heating systems in Beijing, in Beijing’s traditional courtyard homes. There is also a “UK-Guangdong Partnership for Energy Efficiency in Public Buildings”.

Aside from the low-carbon transition EU-China cooperation projects have also helped to address water quality and to a lesser extent the most high profile pollution problem facing China’s cities: its air pollution crisis. Hungary, for example, supports sewage-treatment and water quality improvements in the cities of Shenzhen and Shanghai, as well as research and cooperation into the development of novel biological sewage treatment processes in Guangdong province, at the South China University of Technology. Italy has supported the development of air quality monitoring systems in Beijing, Shanghai, Lanzhou, Suzhou and Urumqi, with capacity-building programmes and assistance in accompanying air-pollution control regulations.

**Green economy**

As explained above, China’s support for research and development, as well as deployment of energy saving, renewable energy and clean technologies is an encouraging aspect of the 12th Five-Year Plan – although governance issues detailed in the previous sections may hamper implementation. Such a drive could provide significant opportunities for European companies operating in these sectors in China or exporting to the country, as domestic demand for green products and services grows. While European firms may also experience increased competition from Chinese green enterprises, procurement policies that favour Chinese enterprises and possibly other hindrances, such as an uneven subsidy regime, Europe can find constructive opportunities to support aspects of green industrial development that might support the development of breakthrough low-carbon technologies as well as forging ties for long-term economic cooperation and green growth.

Some schemes exist in the overlap between sustainable urbanisation and green economy development, such as those focused on mass transit and electric mobility, including programmes on e-mobility under the EC-China automotive working group, between China’s Ministry of Industry and Information Technology (MIIT) and DG ENTR of the European Commission. Italy also has supported sustainable urban transportation projects in Beijing, Shanghai, Shenzhen and Xining for the introduction of low emissions buses; an advanced laboratory for vehicle emissions control; and technology transfer activities for particulate abatement from diesel vehicles.

Furthermore, Germany has supported a research cluster for low-carbon technologies with its Qingdao-based German-Sino Eco Park, planned for the economic and technological development zone of Qingdao city, designed by a German architecture office and implemented and financed by the private sector. Similarly, the Italian Tongji Technology Transfer Center aims at the joint development and transfer of innovative energy efficiency and sustainable mobility technologies. Spain has supported an innovative, reverse osmosis sea-water desalinisation project, designed, constructed and operated by Spanish corporation Abengao, in Qingdao. The UK also supports a project for upgrading the carbon intensity targets of industrial parks in western China, taking Chongqing as an example. The EU-China Institute for Clean and Renewable Energy (ICARE) also aims to train a “critical mass” of Chinese engineers in renewable energy technologies.

However, there are other green industrial sectors in which opportunities for EU-China cooperation may be found, including the recycling sector. China is the world’s largest producer of urban waste and the biggest producer, consumer and exporter of electrical and electronic equipment (EEE) in the world. Like many other environmental problems, the challenges in this field illustrate the need for a functioning legislative framework that can deal with these environmental problems – in this case, the safe disposal of waste as well as the refurbishment of discarded products – as well as the potential for innovation and EU-China cooperation in complex and increasingly crucial areas.

The main Chinese government bodies that deal with recycling and the “circular economy” are the NDRC’s Department of Resource Conservation and Environmental Protection, which take charge of the “formulation and implementation of plans, policies and measures concerning the conservation and comprehensive utilisation of energy and resources, and the development of a circular economy”. The MEP is also responsible for guiding and facilitating the “development of a circular economy and environmental protection industry”, by licensing and standardising recycling and supervising and monitoring the trade in electronic waste. The Ministry of Industry and Information Technology (MIIT) is responsible for eco-design and cleaner production measures, while the Ministry of Science and Technology, the Ministry of Commerce and the Ministry of Finance are all involved in legislative procedures and decisions that will affect the development of the recycling sector.

**Recycling**

In recent years, China has introduced a range of laws, regulations and administrative measures to counteract increasing waste accumulation and to support the establishment of a functioning recycling sector. This includes tightening producer responsibility and designs for recycling, on top of the more general framework laws dealing with waste and recycling, such as: the *Law on the Prevention and Control of Environmental Pollution by Solid Waste*, introduced in 1995 and amended in 2004, which appealed to various levels of government to monitor and supervise flows of solid waste; the *Cleaner Production Promotion Law*, enacted in 2002 and amended in 2012, which called on local governments to “promote cooperation among enterprises in the comprehensive use of resources and waste materials and in other fields, in order to realize the highly effective use and recycling of resources”; and the *Circular Economy Promotion Law*, adopted in 2009, which included a catalogue of products that are subject to compulsory recycling, including air conditioners, refrigerators, washing machines, television sets and personal computers.

However, the dismantling of waste electrical and electronic products (or WEEE) is a risky business, which is known to cause severe health problems and long-lasting, accumulative environmental effects, particularly in southern China – one of China’s more visible health and environmental problems in recent years, and a seamy underside to the high-tech sheen of the computer and personal electronics industry. The efficient and safe recycling of these products is difficult, and has led the Chinese government to announce legislative reforms. The main regulations that deal with the disposal of WEEE are the *Regulation on the Disposal of Waste Electrical and Electronic Equipment*, the *Regulations on the Administration of the Recovery and Disposal of Waste Electrical and Electronic Products* and the *Administrative Measures for the Prevention and Control of Environmental Pollution by Electronic Waste*, enacted in 2008, which made Environmental Protection Bureaus (EPBs) responsible for supervising recycling, according to the *Technical Specifications of Pollution Control for Processing Waste Electrical and Electronic Equipment*.

Similarly crucial, but less reported than the e-waste issue, is that new sales of cars in China, which are increasing quickly, have not only contributed to worsening air pollution and rising greenhouse-gas emissions, but also to the challenge of building sufficient capacity for the recycling of end-of-life vehicles (ELV). It is estimated that by 2017, more than 9 million ELVs have to be recycled in China, similar to the current number of ELVs across the whole European Union. The regulatory framework for end-of-life vehicles is mainly governed by: the *Regulation on the Disposal of End-of-Life Vehicles*, issued by the State Council in 2001, which aimed to prevent accidents being caused by old or refurbished cars, and prohibited the re-use of engines, steering, transmissions, axles and frames; *Management Rules of End-of-Life Vehicles Take-Back*, also introduced in 2001, which ruled that these five car parts should be sent to iron and steel enterprises for disposal; the *Automotive Products Recycling Technology Policy*, introduced in 2006, which set the target that by 2017, 95% of automotive products sold and manufactured in China should be recoverable; and the *Regulations of Remanufacturing Pilot of Automotive Parts*, issued by the NDRC in 2008, which established a pilot project, including 14 companies, engaged in the remanufacturing of car components, including those five parts.

As illustrated in these examples, it is clear that China has promoted its recycling sector through legislative efforts, but major challenges remain. Legal enforcement is poor, hampered by the abstract way that many laws are formulated, as well as the unclear division of administrative responsibilities and powers and the structural holdups described in earlier sections. This lax enforcement has led to the creation of “informal waste streams”, where remanufacturing is handled in an unsafe and environmentally damaging manner. The collusion between local officials and polluting firms described in earlier sections applies to the informal waste sector; while Chinese legislation does not permit the import of most of the secondary raw materials involved, it is one of the world’s most popular destinations for shipments of e-waste, often arriving with legal shipments of second-hand products or materials like cables, wires and mixed metals.

The enforcement of producer responsibility – where companies should collect their discarded products – remains a particular problem for e-waste in China. Many small shops sell EEE products and there is no efficient monitoring system at a local or national level. Initiatives run by mobile phone or personal computer companies to collect used products cannot currently compete with the informal sector, composed of dealers, specialised collectors, secondhand markets and peddlers. Peddlers account for 88% of e-waste collection in China, since there is little functioning infrastructure for the transport and collection of waste. Lax enforcement of customs regulations against smuggling and intellectual property rights against imitation products make this even more of a challenge.

The lack of recycling infrastructure and technological recycling capacity is a problem, too. For ELVs, this is a particular difficulty for more complicated processes like the recycling of automotive electronic control components. The lack of specialised regulations for a wide range of other industries and products – beyond EEE and ELV – such as containers, packaging, construction waste and food waste, is also a problem, potentially explained by the difficulty of generating economic benefits from the recycling of items like containers, leading some to argue that recycling policies in China are chiefly concerned with recovering economic value, rather than reducing waste and environmental risks.

Europe could play a role in the cooperation needed to help address these problems, based on its long experience and high levels of expert knowledge in the field of recycling and recycling policies. The EU WEEE Directive and the EU Directive on Restriction of Hazardous Substances (RoHS) are internationally influential and used as the basis for policies and regulations in China. Concrete cooperation projects could deal with the integration of the informal waste sector into solid waste management, building on experiences such as the “recycling partnerships” developed by GIZ, which emphasise this cooperative approach, based on a mix of technology transfer, training, financing, access to information and the development or improvement of institutional capacities.

The European Union could help China to further promote the development of a sound waste management system by providing information and through schemes such as policy dialogues, capacity building measures, trainings and enterprise cooperation in different provinces and municipalities on topics including: the establishment of a recycling infrastructure for more complicated processes, such as automotive electronic control components; the development of a legal framework for extended producer responsibility in different industries; the promotion of institutional responsibilities and capacities for a more efficient implementation of recycling regulations in China; and the development of special legislative frameworks for waste items like food waste, construction waste, packaging and containers, as well as further quality standards and norms.

**5. Conclusions: opportunities for cooperation**

The scale of the environmental challenge currently faced by China, and the world, is monumental. Global emissions pathways of greenhouse gases are currently at the highest end of IPCC scenarios, suggesting a high chance of exceeding the 2 degrees “safe” limit of average global warming above pre-industrial levels. Such a warming world carries great risks and uncertainties for China, particularly on crucial issues such as food security. China already suffers from extreme weather events, such as the droughts in south-west China in late 2009 and early 2010, which may have been the worst since the founding of the People's Republic in 1949, and affected more than 50 million people. China’s chronic water scarcity, desertification and other problems are also likely to be exacerbated by climate change. Furthermore, given China’s huge population and growing demand for energy and resources, there is no way to address such global problems without China.

Air pollution, biodiversity loss and other environmental problems also strongly suggest a development pathway in need of transition, not only in order to quell rising discontent, but also to stay within “planetary boundaries” that could otherwise lead to severe environmental tipping points and further crises, including potential conflict with downstream riparian neighbours. Fortunately, there is ambition among China’s political elites to bring about this sort of transition. China’s many green laws, regulations and policies speak to this level of concern, and the 12th Five Year Plan is the strongest signal yet of this hope at the central level to shift towards sustainable development.

Europe, which once enjoyed first-mover advantage in a number of green sectors, is now losing ground in the face of China’s massive public investments and sustained policy support for green technologies like renewable energy. Europe’s engagement in the Chinese market needs to be underpinned by coordinated and effective political will at home, including providing clear and certain signals to the market with strong carbon reduction targets and support for green policies across Europe. In the case of sustainable urbanisation, it appears there is strong EU and member state support for a range of collaborative ventures, some of which provide a successful model for future cooperation on environmental themes.

However, despite the laudable ambition of China’s green policies, it is also clear from this paper that China’s superficially authoritarian political structures do not necessarily facilitate effective policy implementation. Given the attention to sustainable urbanisation, it is worth noting the words of Jiang Kejun, from China’s Energy Research Institute, who said in 2010 that most of China’s “low-carbon” city projects were not “genuine”, since many of these cities were still very much on high-carbon development pathways. Policy-making is negotiated between competing elite units; laws are frequently weakened in the process of their creation, and often ignored further down the system, where local officials often have few incentives to implement them. While there is important work to be achieved in technical advancement and cooperation on environmental themes, it is clear that China’s governance systems are also under strain, and these structures are being challenged anew by rising citizen concern, amplified by social media and a burgeoning environmental movement, represented by the country’s many green NGOs.

Here, Europe’s long experience of engagement with social uncertainties and conflicts around environmental questions, from genetically modified crops to nuclear power, could help to inform and improve Chinese policymaking. Europe’s particular strengths – in creating comprehensive systems for transparent environmental information, effective regulations for civil society, developed systems for public participation in planning and environmental decision-making – could be championed in a coordinated fashion by the EU and its member states in its interactions with China, at the same time as ties are deepened in other, technical and economic fields, precisely in order to strengthen those cooperative ventures.

The effect of the recent controversies around heavy smog in Beijing and other cities may be that the role of transparency and citizen engagement is being embraced – and that China’s hitherto unprecedented disclosure of environmental information at the municipal level might be regarded as a model for increased openness in the future. But signals from the current leadership are uncertain: not only do cover-ups of environmental incidents continue at the local level, but also rhetoric from the central level is technocratic, focused on public opinion as something to be monitored rather than engaged with, and sometimes condemnatory of NGO influence, with even government-linked academics who had supported China’s green movement casting civil society as a negative influence, compared to “mass-line” Maoist political organisations.

As crucial UN climate talks approach again, a better understanding of China’s own domestic priorities regarding environmental protection and low-carbon development will need to underpin an ambitious and coordinated approach to climate change from Europe, an approach that advances opportunities for international cooperation, while remaining cautious of unqualified pledges or dogmatic, uniform solutions that pay little attention to the changing, complex nature of Chinese governance.

**6. Recommendations**

1. **Scaling up Europe’s ambition on climate**

Recognising the severity of the climate crisis and the scale of China’s ambition, European policymakers should start at home in their efforts to cooperate on climate change, by demanding Europe adopt strong and certain carbon reduction targets across the EU, spurring a shift in investments towards low-carbon alternatives, and by providing support to organisations and effective frameworks that will supervise and monitor the implementation of such targets.

1. **Understanding environmental governance in China**

Recognising that China’s environmental crisis has been exacerbated by complex structural and state capacity issues and the ambition of the 12th Five Year Plan thus might be difficult to realise, Europe can make the promotion of policy research and experience around environmental governance, particularly at the local level, a renewed priority. This will be particularly important as China develops its 13th Five Year Plan and develops the policy directions laid out in the Third Plenum document.

1. **Championing Europe’s sustainability policies**

At the level of policymakers and exchange among experts, Europe’s long experience in developing effective policies around planning, consultation and public participation could be promoted as an important basis for making higher quality, and more politically sustainable decisions at the local level in China. European experience of environmental transparency – a crucial component of effective public participation – is also world-leading, with schemes like Eye on Earth from the European Environment Agency at the forefront of open environmental information in the new media context. Similarly, experience in developing sustainability indicators could help to promote new forms of environmentally sensitive political evaluation in China.

1. **Promoting civil-society exchange**

Relatedly, at the level of civil society exchange, recognising the early successes of EU-China programmes in civil society dialogue and exchange, such programmes could be supported in order to further encourage research into participatory public policy, the development of a professionalised NGO sector, and ultimately more sustainable and effective environmental governance that harnesses citizen supervision in order to raise environmental ambition and improve local enforcement.

1. **Building cities of the future**

Europe’s support for sustainable urbanisation – a core issue facing China over the next few decades – as well as green economy programmes, shows laudable ambition and commitment to sustainable development objectives and could build a future for stronger ties and cooperation. However, there is a need for greater sensitivity to the particularities of Chinese governance, and how multiple stakeholders, transparency and citizen supervision of projects at an early stage, for example, might increase the effectiveness, enforcement and sustainability of any particular cooperation scheme.

1. **Advancing new agendas**

In the field of technical and economic cooperation, there are also related areas of concern that could benefit from increased attention, including: urban air pollution, which has become a major issue of concern across China, and the solutions to which would have co-benefits in terms of greenhouse-gas mitigation, but on which currently there is little EU-China focus; and recycling and circular economy, in which under-reported but serious environment and health effects have been overlooked, due to lax enforcement and hard-to-regulate informal economies of waste. Here, European experience in policymaking around waste electronics regulation again could be employed to develop more sustainable policies that can be effectively enforced.



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