



# CHINA, THE EU AND CHINA'S TWELFTH FIVE-YEAR PROGRAMME

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# Contents

<b>Acknowledgements .....</b>	<b>7</b>
<b>Abbreviations and acronyms .....</b>	<b>8</b>
<b>Foreword.....</b>	<b>11</b>
<b>Executive Summary .....</b>	<b>13</b>
<b>Introduction .....</b>	<b>20</b>
<b>1 The Planning Environment in China.....</b>	<b>23</b>
1.1 The shift towards guidance planning.....	23
1.2 The five-year planning policy cycle: a summary account .....	24
<b>2 The Eleventh Five-Year Programme of Economic and Social Development.....</b>	<b>28</b>
2.1 Challenges facing China on the eve of the 11FYP .....	28
2.2 The 11FYP: goals and targets.....	30
2.3 The 11FYP: outcomes .....	33
2.4 The impact of EU-China cooperation on the outcome of the 11FYP .....	37
<b>3 The Twelfth Five-Year Programme of Economic and Social Development... 39</b>	
3.1 The 12FYP: themes, goals and targets.....	39
3.2 China's 12FYP: substance or rhetoric? .....	45
3.3 Implementing the 12FYP: challenges .....	46
3.4 China's 12FYP and the EU's Europe 2020.....	50
<b>4 The 12FYP and International Relations, with Particular Reference to the EU .....</b>	<b>52</b>
<b>5 The Regional Perspective: The 12FYP and China's Changing Economic Geography.....</b>	<b>54</b>
5.1 Regional policy: themes and guidelines .....	54
5.2 Urbanisation .....	58
5.3 Implications .....	60
<b>6 Demographic Change, the Labour Supply and Employment .....</b>	<b>61</b>
6.1 China's ageing population and the implications for healthcare and pension provision .....	61
6.2 Employment and wages .....	64
<b>7 The 12FYP and Economic Rebalancing: The Role of Consumption.....</b>	<b>66</b>
7.1 China's consumer revolution .....	67
7.2 Consumption in the 12FYP .....	68

<b>8 The 12FYP: Commercial Opportunities .....</b>	<b>71</b>
8.1 Structural shifts and the policy environment.....	74
8.2 Geographical changes .....	78
8.3 Sectoral analysis .....	79
8.3.1 Energy and environment.....	81
8.3.2 Domestic consumption .....	82
8.3.3 Urban development and livelihoods .....	82
8.3.4 Service sectors.....	82
8.3.5 Strategic sectors: limited opportunities .....	82
8.4 EU trade and investment policy towards China .....	83
<b>9 Education .....</b>	<b>84</b>
9.1 Headline content.....	84
9.2 Contextualisation and interpretation.....	85
9.3 China’s educational policies: risks and challenges .....	85
9.4 Implications for the EU .....	86
<b>10 Science, Technology and Innovation .....</b>	<b>88</b>
10.1 Headline content.....	88
10.2 Contextualisation and interpretation.....	89
10.2.1 Sectoral implications .....	89
10.2.2 Policy implementation .....	91
10.2.3 STI policy: risks and challenges.....	92
10.3 Implications for the EU: STI in the 12FYP and in EU 2020 .....	95
10.3.1 Smart growth: the Innovation Union .....	96
10.3.2 Towards collaboration on strategic challenges .....	97
10.3.3 Issues and opportunities in the EU-China STI relationship.....	101
<b>11 Issues of Sustainability: Energy and the Environment .....</b>	<b>103</b>
11.1 Energy.....	104
11.1.1 Headline content.....	104
11.1.2 Contextualisation and interpretation.....	105
11.1.3 Implications for the EU.....	110
11.2 Environment.....	111
11.2.1 Headline content.....	111
11.2.2 Contextualisation and interpretation.....	112
11.3 Implications for the EU .....	115

<b>12 Conclusion</b> .....	<b>118</b>
12.1 Recommendations.....	124
12.1.1 General.....	124
12.1.2 International relations, with particular reference to the EU.....	125
12.1.3 The regional perspective: the 12 FYP and China’s changing economic geography .....	125
12.1.4 The 12FYP: commercial opportunities .....	125
12.1.5 Education.....	126
12.1.6 Science, technology and innovation.....	127
12.1.7 Issues of sustainability: energy and the environment.....	130
<b>Annex A The Language of Planning in China</b> .....	<b>131</b>
<b>Annex B Provincial Levels of Household Consumption Spending, 2009</b> .....	<b>132</b>
<b>Annex C THE 12FYP on Hong Kong and Macao</b> .....	<b>133</b>
<b>Annex D 12FYP Headline Content on Energy</b> .....	<b>134</b>
<b>Annex E 12FYP Headline Content on Environmental Issues</b> .....	<b>136</b>

## Tables

Table 1: Goals and targets of China’s 11FYP .....	31
Table 2: Goals and targets of China’s 12FYP .....	41
Table 3: Overview of sectoral implications of the 12FYP .....	80
Table 4: China’s energy consumption, 2005-10 .....	106
Table 5: Energy consumption targets for 2015 .....	107

## Figures

Figure 1: GDP growth under 11FYP .....	35
Figure 2: The share of fixed investment, domestic consumption and net exports in GDP growth under the 11FYP.....	36

## Boxes

Box 1: Social management .....	50
Box 2: 12FYP policies designed to enhance openness in coastal, inland and border regions of China.....	58



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In connection with research for the EU on China's Twelfth Five-Year Programme  
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This brief research visit was undertaken primarily to solicit the views of senior staff at the EU Mission and selected EU Member State embassies on the current state of relations between the EU and China in the areas of science and technology and of energy and climate change.

Interviews took place with the following organisations and individuals:

- The EU Mission, Science Attaché (in the absence of the Counsellor)
- The EU Science and Technology Fellowship Programme, Leader Expert and HR Development Expert
- The British embassy, Science Counsellor and Energy and Climate Change Counsellor
- The Dutch embassy, Science Attaché (in the absence of the Science Counsellor)
- The French embassy, Science Counsellor
- The German embassy, Science Counsellor
- The Chinese Academy of Science and Technology for Development, Director
- The Institute for Urban and Environmental Studies, Director General

## Abbreviations and acronyms

ASEAN	Association of Southeast Asian Nations
CAS	Chinese Academy of Sciences
CCP	Chinese Communist Party
CCPCC	Chinese Communist Party Central Committee
DAAD	Deutscher Akademischer Austausch Dienst (German Academic Exchange Service)
DFG	Deutsche Forschungsgemeinschaft (German Research Foundation)
EC	European Commission
EIU	Economist Intelligence Unit
ERA	European Research Area
EU	European Union
FDI	Foreign direct investment
FP7	European Commission, Seventh Framework Programme for Research and Technological Development
FYP	Five-Year Programme (also, prior to 2006, Five-Year Plan)
11FYP	Eleventh Programme for the Economic and Social Development of the People's Republic of China (2006–10)
12FYP	Twelfth Programme for the Economic and Social Development of the People's Republic of China (2011–15)
G8	Group of Eight
G20	Group of Twenty
GDP	Gross domestic product
GHG	Greenhouse gas
IAEA	International Atomic Energy Agency
ICT	Information and communication technology
IPR	Intellectual property rights
IT	Information technology
ITER	International Thermonuclear Experimental Reactor
MAC	Middle class and affluent consumers
MEP	Ministry of Environmental Protection
MOFCOM	Ministry of Commerce
MOST	Ministry of Science and Technology



NBS	National Bureau of Statistics
NDRC	National Development and Reform Commission
NEC	National Energy Commission
NPC	National People's Congress
NSFC	Natural Science Foundation of China
OECD	Organization for Economic Cooperation and Development
OFDI	Outward foreign direct investment
PRC	People's Republic of China
R&D	Research and development
RMB	Renminbi
S&T	Science and Technology
SAR	Special Administrative Region
SCE	Standard coal equivalent
SEPA	State Environmental Protection Administration
SFIC	Strategic Forum for International Scientific and Technological Cooperation
SME	Small and medium-scale enterprise
SOE	State-owned enterprise
STF	EU Science and Technology Fellowship Programme China
STI	Science, technology and innovation
WTO	World Trade Organization



## Foreword

China has long since ceased to be an economy run by policymakers from the central government. From 1953, when the first Five-Year Plan was launched, until 1978, when the current era of reform and opening up began, it has been calculated that 99 per cent of economic production was in the hands of the state. The old Soviet-style model of central planning reigned supreme. These days, after more than three decades of marketisation, most estimates put the balance at 50-50 between state and non-state actors.

Even in this situation, however, China maintains the Five-Year Plan model, even though since the early 2000s Plans have been called 'Programmes', giving them a looser, less prescriptive feel. The current Programme, the 12th, which was sanctioned by the National People's Congress in early 2011 after extensive discussion among China's provincial governments and its central ministries, is due to run until 2015. It is the most authoritative and comprehensive statement from the government of their vision of China's economic growth and its priority areas over this period. We also have to keep in mind that in the course of these five years the Chinese Communist Party, and the government, will undergo an important leadership change. Despite this, the 12th Five-Year Programme, in terms of growth projections and budgetary commitments, will be the critical document against which the Chinese government will be judged. In that sense, the Programme lies somewhere between being a fiscal statement like those issued by Western governments and a political manifesto setting out key strategic areas where change needs to occur.

The authors of this, the first ECRAN long paper, could not be better qualified to try to make sense of what the 12th Programme means and how those outside China, or dealing with China, might best try to make sense of it. Among them, they combine long experience as academics, government advisers and officials. In this comprehensive treatment of the Programme, they set it in context, interpret some of its most important statements and then set out why it contains information that can, and should, help to inform interaction, whether at the government or corporate level, with China.

There is debate about whether such Programmes have much meaning now that the Chinese economy is so deeply marketised. Professors Ash, Porter and Summers say that the Programme is not just rhetoric and that despite its lack of firm benchmark delivery targets in many areas, it needs to be taken very seriously as a statement of political intent. In its discussion of innovation and social management, for example, the Programme shows the government's intention to act on the critical need for changing the Chinese economy to higher-quality growth, dealing with sustainability and also addressing some of the inequalities and contention in a society undergoing rapid social and material change. The new leadership will meet its greatest challenges in these areas, and the Programme gives clues at least to how they intend to set up the right mixture of policy and administrative structure to deal with those challenges.

I am very glad that for our first long paper we have been able to call on three such experienced and eminent experts, and I am also glad that their work is emblematic of the collaborative approach that we hope to see as ECRAN as a project continues in the coming two years. Hopefully this paper will stimulate debate and discussion about what the Programme is, what its impact on China's future development might be and, finally, what that means to us in the EU and the wider world.

**Kerry Brown**  
**Team Leader, ECRAN**  
January 2012

## Executive Summary

### Background

- 1 In March 2011, the Chinese government released its Twelfth Five-Year Programme for Economic and Social Development (12FYP), the latest in a series of five-year plans dating back to the early 1950s. The 12FYP sets out the government's intentions across a broad spectrum of development policy issues up to and including 2015.
- 2 The 12FYP is far more than a propaganda exercise, and should be taken seriously by all interested parties outside China. Whether or not its specific targets are fulfilled, it is a clear and coherent statement of intent and of the direction in which China seeks to travel. It offers unambiguous guidance to foreign governments and to the EU about China's strategic priorities.
- 3 Close reading of the 12FYP reveals scope for enhanced engagement, through dialogue and other means, on important issues of common concern and shared interest, including education, scientific and technological cooperation, energy saving and environmental enhancement. There is also considerable potential for collaboration on commercial and research projects. Taken as a whole, the 12FYP is a signpost to opportunities in which co-operation between China and the EU can be strengthened.
- 4 During the period of the 12FYP, China's development trajectory will be shaped more by domestic forces than by external drivers. This is partly attributable to the impact of the global financial crisis. But it also reflects the Chinese government's determination to rebalance the economy by making domestic consumption a more potent growth driver. There will,

however, be no decoupling from the global economy, in which China will continue to play an active role.

- 5 Both China's 12FYP and EU2020 prioritise 'sustainable' and 'inclusive' growth. Under these broad headings, there are many areas – for example, science and technology, innovation, education, energy conservation and climate change – in which the pursuit of common goals should be translated into enhanced cooperation.

## **1 The planning environment in China**

- 1.1 In contrast to the dirigiste planning of the past, the 12FYP maintains the shift towards 'guidance' planning begun under the 11FYP. In addition, there is overlap and continuity between successive FYPs. If targets are not met within the specified five years, work towards their fulfilment may continue under the next FYP. The introduction since the 11FYP of binding and aspirational targets has facilitated this approach.
- 1.2 Complementary sectoral, regional and thematic plans, in some cases still being formulated, will detail the means whereby the goals of the parent programme are to be fulfilled. In some sectors, longer-term plans exist whose objectives are consistent and complementary with those of the 12FYP (e.g., the Medium and Long-Term Plan for Science and Technology, 2006–2020).

## **2 The 11th Five-Year Programme for Economic and Social Development**

- 2.1 The 11FYP (2006–10) sought to shift the development ethos away from growth maximisation towards greater sustainability, including the achievement of more equal regional and sectoral income distribution (creating a 'harmonious society') and a more balanced economic structure.
- 2.2 Almost all quantitative 11FYP targets are reported to have been fulfilled or, as in the case of GDP growth, overfulfilled. But progress towards reversing widening gaps in wealth and urban–rural disparities was disappointing. Sectoral imbalances in the economy also persisted.

### **3 The 12th Five-Year Programme for Economic and Social Development**

- 3.1 The 12FYP is a more detailed blueprint than its predecessor.
- 3.2 At the heart of the 12FYP is a renewed determination to rebalance the economy by raising the share of domestic, especially household, consumption in GDP and to pursue more inclusive growth.
- 3.3 Core objectives of the 12FYP include:
- to give greater weight to services in the economy;
  - to enhance manufacturing competitiveness;
  - to achieve more balanced urban and rural growth through accelerated urbanisation;
  - to achieve more balanced interregional growth;
  - to raise educational standards and to strengthen the role of science and technology in facilitating economic modernisation;
  - to translate growth into improved material living standards and levels of welfare for all urban and rural residents through job creation, more equal income distribution and the provision of comprehensive social welfare insurance;
  - to use resources more effectively and to protect the environment by implementing measures to conserve energy, reduce greenhouse gas emissions and address the consequences of climate change; and
  - to harmonise population growth and economic development.
- 3.4 The role of market forces is still a matter of debate among Chinese policy elites. On balance, market forces are unlikely to be extended under the 12FYP, and the role of the state in shaping development strategy will increase. Overall, however, economic change will reflect the combined impact of the market and state-led policy instruments.
- 3.5 No significant political change is expected to take place during the next five years, including in areas of human rights and democratisation.

### **4 The 12FYP and international relations**

- 4.1 In the international arena, the next five years will see increased engagement with global organisations by China in order to protect its interests.
- 4.2 The 12FYP's message is one of further opening to the outside world and the pursuit of 'win-win' cooperation.

## **5 The regional perspective: the 12FYP and China's changing economic geography**

- 5.1 Since 2007, GDP growth in central and western provinces of China has exceeded that of the coast.
- 5.2 The 12FYP seeks to further reduce disparities in regional development. Successful implementation of its policies will bring significant changes in the spatial dimension of the Chinese economy, as the benefits of growth continue to spread inland.
- 5.3 Accelerated urbanisation will be reflected in the emergence of new cities and city clusters as prominent centres of economic activity.
- 5.4 Important though they are, these changes will leave the dominant role of coastal provinces as the drivers of China's economic growth unchanged.

## **6 Demographic change, the labour supply and employment**

- 6.1 Accelerated population ageing will impose heavy demands on social insurance in China, especially health care and pension provision.
- 6.2 The 12FYP includes plans for a major expansion of health and pension coverage among urban and rural residents.
- 6.3 China's working-age population is expected to peak at some point during 2016–20.
- 6.4 However, employment is expected to continue to rise (by 45 million in the urban sector), with a projected 40 million rural workers transferring to the urban sector.
- 6.5 Expansion of small-scale, labour-intensive and service activities will be an important source of employment growth and will also help to enhance China's green credentials.
- 6.6 The 12FYP anticipates significant rises in wages, with minimum wages expected to rise by at least 13 per cent per annum during 2011–15.
- 6.7 Expanding employment and wage rises are expected to facilitate economic rebalancing by fuelling consumption.



## **7 The 12 FYP and economic rebalancing: the role of consumption**

- 7.1 Raising the share of household consumption in GDP was a major goal of the 11FYP, and was unfulfilled. Between 2000 and 2010, household consumption's share in GDP fell from 46 per cent to 34 per cent.
- 7.2 The combined impact of various initiatives under the 12FYP – including extended social insurance provision, job creation and higher wages, increased subsidies and a rising share of services in GDP – is expected to facilitate a significant increase in household consumption.
- 7.3 Projected tax adjustments will also help to stimulate domestic demand.
- 7.4 The age cohort that will drive consumption will be China's 'baby boomers', those born since about 1980. By the end of the 12FYP period, this group will account for more than half of China's population.
- 7.5 The consumption behaviour of the elderly too will be an important determinant of domestic demand.

## **8 The 12FYP: commercial opportunities**

- 8.1 With bilateral trade of €395 billion in 2010, the commercial relationship between China and the EU remains substantial. But trade diversification by China signals a relative decline in Europe's share of both trade and investment.
- 8.2 Nevertheless, the Chinese government argues that the 12FYP offers major opportunities to European firms, which promise to translate into 'win-win cooperation'.
- 8.3 Increased domestic consumption under the 12FYP will offer new opportunities to European firms, as will China's implementation of its energy and environment policies.
- 8.4 Sectors in which European firms stand to gain include:
  - high-tech industries (e.g., telecommunications and aerospace);
  - social welfare insurance (pharmaceuticals, hospitals, care homes);
  - clean energy and green economy (e.g., low-carbon technologies);
  - consumer products (especially luxury goods); and
  - services (business services, finance and insurance).

- 8.5 At the same time, implementation of 12FYP policies will present European companies with big commercial challenges. Among them are increased competition from domestic enterprises and procurement policies that favour Chinese firms. EU Member State firms based in China will also face higher costs of production and continuing problems associated with the abuse of intellectual property rights.
- 8.6 China's outward foreign direct investment is expected to increase substantially during the the 12FYP period.

## **9 Education**

- 9.1 Highlights of the 12FYP's educational provisions include improving educational standards, extending coverage of the existing nine-year compulsory education system (especially in rural areas), achieving a gross enrolment rate of 87 per cent in high schools and expanding the provision of pre-school facilities and vocational education.
- 9.2 In higher education, there is also a commitment to improving quality across the board. In particular, the 12FYP seeks to speed up the development of 'world-class' and 'high-level' universities.
- 9.3 There already exists substantial cooperation between universities and some schools in China and EU Member States, as well as a significant flow of students from China to EU educational institutions. Fulfilment of the 12FYP educational goals should provide for the continued mobility of students between Europe and China at senior school, undergraduate and postgraduate levels. Greater efforts are needed to encourage European students to study in China.

## **10 Science, technology and innovation**

- 10.1 China faces a legacy of problems in science and technology. These include inadequacies of research infrastructure, the existence of conflicting responsibilities in some areas and the loss of indigenous talent to foreign companies operating overseas and in China itself.
- 10.2 Foreign companies face their own difficulties. These encompass the abuse of intellectual property rights, uncertainty about the status of China's 2006 'indigenous innovation' policy, confusion about the meaning of 'innovation' in the Chinese context and the implications of China assuming a default position of self-sufficiency in technology.

- 10.3 The 12FYP prioritises key areas of science and high technology, building on the more limited initiatives under the 11FYP. It aspires to 'top-ranking achievements', especially in physical sciences, life sciences, space science, earth sciences and nanoscience and nanotechnology.
- 10.4 The 12FYP seeks to reform research infrastructure and systems. Simultaneously, it seeks to use administrative measures and market mechanisms in order to help integrate China's enterprises more fully into research and development activity.

## **11 Issues of sustainability: energy and the environment**

- 11.1 Priorities under the 12FYP include conservation of energy and other resources, protection of the environment, a reduction in greenhouse gas emissions, development of low-carbon technologies and combating the effects of climate change.
- 11.2 One of the binding targets in the 12FYP is to reduce energy consumption per unit of GDP by 16 per cent between 2010 and 2015.
- 11.3 In the next five years China will also seek to diversify its sources of energy, with particular emphasis on raising the share of renewable and clean sources in total primary energy consumption.
- 11.4 The main focuses of environmental concerns in the 12FYP are climate change and the creation of a 'green' economy.
- 11.5 In addition to increasing its capacity to adapt to climate change, China will engage more strongly in international cooperation in order to combat its effects.
- 11.6 The 12FYP specifies four binding targets as part of its efforts to reduce emissions of major pollutants.
- 11.7 China also plans to reform its environmental pricing policy and to strengthen environmental monitoring, supervision and governance.
- 11.8 Despite public perceptions to the contrary, the 12FYP and EU2020 display many areas of common concern. Both call for major research into the impacts of climate change and the contribution of alternative energy sources; both are also advocating low-carbon or no-carbon solutions. A gradual convergence of views is emerging as China moves away from the mantra of 'development at any price', to which it was previously committed.

## Introduction

This paper seeks to analyse and assess some of the major opportunities and challenges in China's Twelfth Five-Year Programme for Social and Economic Development (hereafter 12FYP).<sup>1</sup> The main economic thrust of the 12FYP is one of sustainable, balanced and innovative development; its principal social thrust is that the government should enhance its support for 'livelihoods' (*minsheng*) in order to create a 'moderately well-off' (*xiaokang*) society by 2020.<sup>2</sup>

We find that during the period of the Programme's implementation (2011–15), China's development trajectory will be increasingly shaped by *domestic* factors

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<sup>1</sup> *Zhonghua Renmin Gongheguo guomin jingji he shehui fazhan di shier ge wunian guihua gangyao* [Outline 12th Five-Year Programme for National Economic Social Development of the People's Republic of China] (hereafter referred to as *Gangyao*) (Beijing: Renmin chubanshe, March 2011). The English Section of the Central Document Translation Department of the Central Compilation and Translation Bureau has published an official translation of the 12FYP in Beijing called *Twelfth Five-Year Plan for National Economic and Social Development of the People's Republic of China* (hereafter CDTD, *Twelfth Five-Year Plan*) (Beijing: Central Compilation and Translation Press, 2011). References in this paper are given to both the Chinese and the English-language versions of the 12FYP, but direct quotations from the 12FYP are from CDTD.

<sup>2</sup> In 2000, the Chinese Communist Party set a target of quadrupling GDP by 2020, with a GDP per capita target associated with *xiaokang* understood to be around US\$3,000 (c. Euro 2,300), similar to that for middle-income countries. Since then, China's economy has grown faster than necessary to achieve the quadrupling; and taken together with the appreciation of the RMB, a figure approaching US\$10,000 (c. Euro 7,700) may be a more appropriate indicator. See Cheng Li, 'China in the Year 2020: Three Political Scenarios', *Asia Policy*, No. 4 (July 2007) (downloaded from [www.brookings.edu/views/articles/li200707.pdf](http://www.brookings.edu/views/articles/li200707.pdf), September 2011). Not so much a per capita figure, *xiaokang* is perhaps best understood as the aim of delivering a reasonable standard of living right across the country (per capita aggregates disguise potential wealth disparities). For example, in recent Party restatements of 'Develop the West', it has been argued that stronger development of western China is necessary for the country to achieve *xiaokang*, an argument that would not have been necessary had the aim simply been the attainment of an aggregate national GDP per capita figure.

and forces. Of these, the most important is projected to be a significant increase in domestic demand (above all, household consumption). Two forces are at work here: the fragility of global economic conditions and the Chinese leaders' sense of overexposure to global economic risk associated with this fragility. Such considerations will inevitably constrain China's economic relations, especially with Western countries and Japan. Another factor is the reality that as its economy continues to grow, China's dependence on external drivers is likely to diminish.

This is certainly not to suggest that China is set to re-embrace a policy of self-reliance. The principle that there is no decoupling in the global economy applies as much to China as it does to any other major economic power. Its leaders' response to the problems besetting the United States and the Eurozone in summer 2011 is a clear acknowledgement of this principle. Moreover, the 12FYP itself highlights the continued importance of China's outward economic orientation, albeit in a context of plans to restructure its foreign trade and, in particular, to give as much weight to outward as to inward flows of foreign direct investment (FDI). Indeed, the rapid growth of China's outward foreign direct investment (OFDI) is likely to be a major feature of its development trajectory during the next five years. From all these perspectives, China's economic ties with countries such as the United States or European Union (EU) Member States will still be of major significance. But we would make a qualification here: Chinese leaders' protestations that their country's economic fate is inextricably linked with that of the rest of the world should be interpreted as referring to its linkages with not only OECD members but also the wider international community. It is no coincidence, for example, that the 12FYP's discussion of China's role in global economic governance is placed in the framework of the G20.

Meanwhile, the European Commission (EC) has set out its own vision of the future in the form of its 'Europe 2020 Strategy' (hereafter *Europe 2020*). In its pursuit of economic, social and environmental renewal in the wake of the recent global economic crisis, the EC's new strategy has prioritised growth that is 'smart, sustainable and inclusive'.<sup>3</sup> The underlying message is that by expanding its educational and technological capacities, promoting resource

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<sup>3</sup> European Commission, 'Europe 2020: A Strategy for Smart, Sustainable and Inclusive Growth', Brussels, 3 March 2010, p. 3. See <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM;2010:2020:FIN:EN:PDF> (accessed on 12 June 2011).

efficiency and a greener environment and implementing more progressive employment and labour market policies, the EU will more readily fulfil the productivity, employment and distributional goals that are in its vision of 'Europe's social market economy for the 21st century'.<sup>4</sup>

There are striking similarities in the economic, social and welfare outcomes to which both China and the EU have committed themselves. It is striking, for example, that one of *EU 2020's* priority goals – attainment of 'sustainable' and 'inclusive' growth – encompasses a range of objectives specified in China's 12FYP. From some perspectives, there are also similarities in the diversity of economic and social conditions that characterise the two economies, although appropriate allowance must be made for the different domestic and international *political* contexts in which their plans are formulated. Such similarities highlight the potential scope for collaboration and mutual engagement, by government, commercial and academic representatives, inherent in the vision for the future set out in the two documents. At the same time, it would be foolish to ignore factors that have the potential to weaken cooperation. Many of these are political. But others – for example, issues relating to the EU's bilateral trade deficit vis-à-vis China, the undervaluation of China's currency, protection of intellectual property rights (IPR) and the maintenance of non-tariff barriers to trade – are not. It is still too early to judge to what extent in the foreseeable future the strategic partnership between China and the EU will facilitate the advancement of their respective economic, social and political agendas.

Whatever the future holds, both sides clearly see themselves as having reached a turning point in their respective development strategies. It is for this reason that linkages between China's 12FYP and the EU's *Europe 2020* strategies are discussed at a number of points in the following analysis.

This paper does not seek to provide a comprehensive assessment of the 12FYP. Rather, it focuses on a number of core issues that have potentially significant implications for the EU and its Member States. The first three sections are of a general nature. Following initial discussion (Section 1) of the planning environment in China, sections 2 and 3 review the content and outcome of the Eleventh Development Programme (11FYP) (2006–10) and analyse and assess the guidelines of the Twelfth FYP (2011–15). There follows a brief comment (Section 4) on the implications of the 12FYP for international relations, with

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<sup>4</sup> Ibid.

particular reference to the EU. Section 5 examines the impact of the Programme on China's economic geography, including urbanisation. Each of the remaining six sections is organised around a major developmental theme. They address, in turn, issues relating to population change and employment; the changing role of consumption; commercial opportunities; education; technology and intellectual property rights; and sustainability (energy, climate change and environmental policies). A concluding section summarises the findings of the paper and considers their implications for future EU policy vis-à-vis China.

## 1 The Planning Environment in China

### 1.1 The shift towards guidance planning

Under the impact of post-1978 economic reforms, the planning environment in China has changed quite dramatically. The changes that have taken place follow from China's espousal in October 1992 of a 'socialist market economy'. As it has evolved, this hybrid system has embodied increasingly powerful market forces, but in a context in which there is a considerable degree of residual public ownership. Thus although prices and markets have come more and more to shape China's growth trajectory, the government has also remained an arbiter of decision-making in some key areas of the economy.

China's continued formulation of five-year plans (now called programmes) highlights the government's determination that it should set long-term national strategic priorities. It also reflects the belief that the framework of a five-year plan is conducive to maximising growth and development ('five-year plans have helped create China's economic miracle'<sup>5</sup>).

Under China's five-year plans until the end of the 1970s, all major production and distribution issues were resolved in accordance with centrally determined strategic priorities, embodied in detailed output targets. But as subsequent reforms took hold and non-state economic expansion accelerated in the 1980s, both the scope and the nature of planning were adjusted and the number of quantitative targets contracted markedly. In the 1990s, the boundaries of the

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<sup>5</sup> Hu Angang, quoted in *China Daily*, 10 March 2011. According to Hu, of the 10 countries with the highest rates of economic growth in 1990–2005, eight implemented five-year plans. In the wake of the global financial crisis, only three G20 countries (China, India and Indonesia) subsequently maintained positive GDP growth – each within the framework of a five-year plan.

central government's direct managerial involvement in the economy became more circumscribed. Also, the main thrust of planning shifted towards *guidance* and *supervision*.

The 11FYP was a watershed in terms of both the rhetoric and the evolution of planning under the impact of reform:<sup>6</sup> for the first time in half a century of economic planning, a Chinese five-year plan was designated as a *guihua* ('guideline programme') rather than as a *jihua* ('plan'). This was no mere semantic change. Instead, it definitively signalled China's abandonment of administrative planning in favour of a more open, transparent and consultative approach towards the formulation of economic strategy.<sup>7</sup> The evolutionary aspect of the change was captured in the downgrading of quantitative targets (the 11FYP contained just 22 such targets) in favour of much more emphasis on qualitative principles and goals (e.g. pursuit of a 'harmonious society' or, in Western parlance, greater sustainability). The classification of targets into two new categories, *yueshuxing* ('binding') and *yuqixing* ('predictive'), was another important initiative. These changes, which are also embodied in the 12FYP, mark important breaks with the past. They suggest that the Chinese government is adopting a more subtle and sophisticated approach in its efforts to guide the economy towards a more sustainable development trajectory.

## 1.2 The five-year planning policy cycle: a summary account

China's five-year programmes are blueprints that set out broad strategic national goals reflecting social and economic development priorities. Analysis of China's planning cycle highlights several important findings:

- Under the impact of post-1978 reforms, planning in China has shifted from a process characterised by highly centralised and interventionist methods towards one whose intent is to guide, but not dictate, economic decision-making.
- As it has evolved in recent years, the planning process has become more open and consultative.
- The formulation of development plans has displayed increasing transparency.

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<sup>6</sup> Annex A summarises important Chinese terms relating to economic planning.

<sup>7</sup> See Cindy Fan, 'China's Eleventh Five-Year Plan (2006-2010): From "Getting Rich First" to "Common Prosperity"', *Eurasian Geography and Economics*, vol. 47, no. 6 (2006), pp. 718–19.



- The complexity of the planning process reflects the continental scope of the Chinese economy and the huge diversity of conditions within it. These characteristics have also necessitated the formulation of supplementary regional, sectoral and thematic plans and work programmes, designed to provide local officials and other agents with detailed guidance on how to fulfil the broad goals set out in the parent FYP.
- The planning framework, as it now exists in China, provides quite effective monitoring and policy adjustment mechanisms.

Inherent in China's extended five-year planning cycle are in-built linkages between successive FYPs. Within the complex hierarchy of development programmes, the implementation and monitoring of one FYP overlap with the formulation of the next. This, in turn, tends to be reflected in the continuity of both policy and policy goals between successive plans. Thus, any FYP may be viewed as part of a continuum of mutually reinforcing five-year segments of time, characterised by overlapping policies designed to fulfil shared macro-goals. It is therefore no coincidence that strong policy continuity exists between the 11FYP and the 12FYP (see also Section 3).

Given China's continental scope, no single document can articulate the gradations in policy and objectives that are essential in order to accommodate the varied nature of social and economic conditions. Accordingly, as indicated above, the parent FYP is supplemented by more detailed regional, sectoral and thematic 'sub-plans'. Nor is the planning process static: in-built mechanisms now exist that allow adjustments to be made to both policies and targets during the implementation process itself.

The much more open and consultative nature of planning in China is seen in the evolutionary process that has characterised the formulation of both the 11FYP and the 12FYP. In the case of the latter, this process began halfway through the *previous* FYP period. In summer 2008, the National Development Reform Commission (NDRC), the body that takes the lead in coordinating China's FYPs, commissioned mid-term evaluations of the 11FYP from Tsinghua University's Centre for China Studies, the State Council's Development Research Centre and

the Beijing Office of the World Bank.<sup>8</sup> Their critique of progress towards meeting that Programme's goals not only had implications for policymaking during the rest of the 11FYP period but also helped to shape the initial formulation of the 12FYP.

In the light of these findings, the NDRC recruited experts, scholars and business representatives over the following 12 months in order to suggest development guidelines for more than 20 priority policy areas under the 12FYP.<sup>9</sup> Out of this process emerged the main thrust of the new Programme, which, after discussion by senior Chinese Communist Party (henceforth Party) and government officials, was officially endorsed in February 2010. At this time, the Chinese Communist Party Central Committee (CCPCC) Politburo appointed Vice-Premier Li Keqiang<sup>10</sup> to take charge of a working party for drafting a FYP 'proposal' (*jianyi*).

The principal *institutional* facilitators of the formulative process during the subsequent eight months were the NDRC and the State Council, acting in consultation with relevant departments. In an effort to ensure that their proposals would be as representative as possible, members of the drafting group undertook provincial visits and spoke with stakeholders. The NDRC also solicited public views and suggestions through an office set up for this purpose. From this planning process emerged an FYP 'Proposal' that was submitted to the Fifth Plenary Session of the 17th CCPCC in October 2010. After discussion and its formal endorsement by the CCPCC, the Proposal was published.<sup>11</sup>

Between November 2010 and February 2011, the final drafting of the 12FYP took place, eventually generating an outline document (*gangyao* – see Annex A) that was submitted to the National People's Congress (NPC) for discussion at its

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<sup>8</sup> See World Bank, Poverty Reduction and Economic Management Unit, East Asia and Pacific Region, 'Mid-term Evaluation of China's 11th Five-Year Plan', Report No. 46355-CN, 18 December 2008, available at [http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2009/03/12/000334955\\_20090312072154/Rendered/PDF/463550Midterm00YearPlan0finalreport.pdf](http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2009/03/12/000334955_20090312072154/Rendered/PDF/463550Midterm00YearPlan0finalreport.pdf) (accessed on 18 June 2011).

<sup>9</sup> Hu Angang has described this as 'the largest policy consulting and research activity conducted anywhere in the world', *China Daily*, 11 April 2011.

<sup>10</sup> Li Keqiang was formerly Party Secretary of both Liaoning and Henan provinces. He has been a member of the CCPCC since 1997, and in 2007 was appointed to the CCPCC Politburo. He is currently Senior Vice-Premier, and is expected to replace Wen Jiabao as premier in 2012.

<sup>11</sup> See *Zhonggong Zhongyang guanyu jue ding guomin jingji he shehui fazhan de shier ge wunian gui hua de jianyi* [Proposal of the CCP Central Committee on the Twelfth Five-Year Guidance Programme for National Economic and Social Development] (Beijing: Renmin chubanshe, October 2010).

annual meeting in March. Following its formal endorsement, the Outline was published.<sup>12</sup> It is this document that is generally referred to when reference is made to China's 'Five-Year Programme [Plan]'.

Far from marking the end of the planning process, the publication of the Outline has been followed by three further phases. In the first phase, regions (provinces and cities) and government ministries are charged with formulating a plethora of sectoral and thematic special plans designed to show in greater detail how the broad goals set out in the Outline FYP are to be achieved. In the second one, facilitating documents are made available, to help implement and coordinate policy. These are supplemented, in the final phase, by the release of very specific 'work programmes' and 'implementive programmes' to local officials. By the time that these have been issued, the FYP will probably have already reached its mid-point and be approaching the mid-term evaluation.

Inherent in the extended nature of China's five-year planning cycle are in-built linkages between successive FYPs. Within the complex hierarchy of overlapping plans, the policy formulation, implementation, monitoring and adjustment within one FYP period overlap with preparations for the next FYP. This gives rise to an important degree of continuity, in terms of both policy goals and policy implementation, between different plans. Thus, any FYP should be seen as part of a continuum of an unknown number of stages through which priority goals, whether expressed as quantitative targets or as the attainment of a qualitative change, are fulfilled. Accordingly, failure in an aspect of one plan can be rectified by reincorporating the associated goal in the successor FYP. From this perspective, it is no coincidence that a high degree of continuity should exist between the 11FYP and the 12FYP, and even beyond.

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<sup>12</sup> See *Gangyao*.

## 2 The Eleventh Five-Year Programme of Economic and Social Development

### 2.1 Challenges facing China on the eve of the 11FYP

From the end of the 1970s until the early 2000s, China's gross domestic product (GDP) grew more rapidly than in any previous period of its history, generating unprecedented rises in corporate profits and disposable income. Under the impact of market-orientated reform, major changes took place in the domestic economy while China also became an important actor in the global economy.

However, despite these remarkable achievements, in 2003–04 the Chinese government announced a major shift in its development strategy away from growth maximisation towards sustainability, often referred to by the Chinese government as 'harmony'.<sup>13</sup> The creation of a 'harmonious society' (hexie shehui) was at the heart of the 11FYP.

This change in the government's mindset was profound, and led it to highlight a number of what may be thought of as fault lines that had emerged during the previous two decades. By the early 2000s, these fracture points had come to pose severe economic and social challenges to the government in its efforts to maintain the momentum of growth without undermining stability. Failure to meet these challenges carried the real danger of exacerbating social unrest and might even have posed a threat to the Party's authority.

The principal fault lines were as follows:

- Resource pressures and shortages resulting from the pursuit of high growth: the pace of economic growth since the 1980s had placed increasing pressure on China's natural and economic resources – land, water, energy, raw materials and infrastructure. For example, the potentially serious threat posed by dwindling supplies of land and water was manifest in the finding that with just 8 per cent of the world's arable land and 9 per cent of its water, China was seeking, as it still does, to feed about 20 per cent of its population.

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<sup>13</sup> The 3rd Plenum of the 16th CCPCC first formally enunciated the notion of a 'scientific development concept' (*kexue fazhuan guan*) in October 2003. It advocated 'putting people first and establishing a comprehensive, coordinated and sustainable view of development' (quoted in Barry Naughton, 'The New Common Economic Program: China's Eleventh Five Year Plan and What It Means', *China Leadership Monitor*, No. 16, Hoover Institution, Stanford University, October 2005, p. 2, available at [http://media.hoover.org/sites/default/files/documents/clm16\\_bn.pdf](http://media.hoover.org/sites/default/files/documents/clm16_bn.pdf) (accessed on 19 June 2011).

- Increasing economic polarisation: rapid economic growth had, quite unambiguously, raised material consumption, but had done so at the cost of polarisation – widening economic differentials and increasing inequality in income distribution. Thus, estimates of average per capita consumption for 2005 (the eve of the 11FYP) showed that households in only 12 provinces and provincial-level municipalities, including all nine coastal units,<sup>14</sup> enjoyed consumption spending that was above the national average. At the bottom end of those estimates, five provinces had spending that was 35 per cent or more below the national average; and a further five were at least 25 per cent below that level. At the top end, consumer spending in Beijing was almost three times higher than the national average; and in Shanghai, it was four times higher.
- These are very aggregate estimates. They serve, nonetheless, to highlight the fact that the benefits of reform have accrued disproportionately to coastal provinces, especially to those living in cities there. And time-series data showed that since the mid-1980s, the gap between the urban and rural sectors had been steadily widening. In 1985, the household consumption gap was 2.2:1 in favour of urban households; by 2005, it had risen to 3.2:1. As a result, China, which in the mid-1990s was one of the most egalitarian societies in the world, was well on the way to becoming one of the most unequal, with a national Gini coefficient<sup>15</sup> well in excess of 0.45.
- These widening gaps were increasingly reflected in expressions of discontent and frustration among large numbers of unemployed and low-paid urban workers, surplus farm labourers and other marginalised groups. Their material deprivation was reinforced by inadequate access to social security provision and other services (health, education, pensions etc.). Popular resentment was exacerbated by exploitation on the part of local government officials and by endemic corruption.
- Environmental costs of high growth: by the early 2000s, environmental degradation in China had, in some respects, reached apocalyptic proportions. As the director of the State Environmental Protection

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<sup>14</sup> The three non-coastal provinces were Heilongjiang, Jilin and Hubei.

<sup>15</sup> The Gini coefficient is a commonly used measure of income distribution. Its value ranges from 0 (implying a perfectly equal distribution of income) to 1 (all income concentrated in the hands of a single individual).

Agency, Zhou Shengxian, put it in a speech in August 2005: ‘The environmental situation remains very grim.... Environmental problems seriously restrict our economic development, harm people’s health, affect social stability and sully the image of our country.’<sup>16</sup>

- Prodigality in the use of resources not only had generated serious shortages but also was accompanied by pollution on an unprecedented scale. Such problems imposed a huge social and economic cost, and had the potential to exact an even greater political cost. Environmental concerns too had become a major source of social protest among urban and rural residents in recent years.

These were the factors that in 2003–04 led the administration under Hu Jintao and Wen Jiabao to place a high premium on guiding China towards a more ‘harmonious’ and sustainable pattern of economic and social development – a new ethos that has since informed both the 11th and the 12th Five-Year Programmes. Without underestimating the remarkable economic and welfare impact of China’s post-1978 development record, the formidable list of problems that had come to face the Chinese government was a salutary reminder of the very high costs associated with the previous unblinkered and unrestrained growth maximisation ethos. It was a cost that the Chinese premier himself subsequently acknowledged in a remarkably candid admission that China’s economy had become ‘unstable, unbalanced, uncoordinated and unsustainable’.<sup>17</sup>

The Hu-Wen leadership’s response to these challenges in effect redefined China’s developmental orthodoxy. This change of mindset was central to the 11FYP and has been embodied in the 12FYP.

## 2.2 The 11FYP: goals and targets

Against the background of serious structural problems associated with more than two decades of unprecedented economic growth, the main thrust of the new Programme was not merely to facilitate continuing high growth but to find a way of accommodating social and economic pressures without unduly

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<sup>16</sup>Quoted in Robert F. Ash, ‘Quarterly Chronicle and Documentation’, *The China Quarterly*, No. 188, December 2005, p. 1169.

<sup>17</sup>Wen Jiabao speaking at a press conference at the 2007 NPC.

sacrificing expansionary momentum.<sup>18</sup> The 11FYP's solution was to advocate implementation of a new developmental principle of 'scientific development' in order to create a 'harmonious socialist society'. Implicit in the new approach was a belief that growth was meaningless unless it 'put people first'.<sup>19</sup>

Eighteen specific targets were included in the 11FYP, and are shown in Table 1.

Table 1: Goals and targets of China's 11FYP

Indicator	Unit	Nature of target	Base year (2005)	Plan		Realised outcome	
				2010	Growth p.a. (%)	2010	Growth p.a. (%)
<b>ECONOMIC GROWTH AND STRUCTURE</b>							
Gross domestic product (GDP)	M yuan	Predictive	1,850	–	7.5	3,980	11.2
Per capita GDP	Yuan	Predictive	14,185	–	6.6	29,748	10.6
Service sector share in total value-added	%	Predictive	40.5	{43.5}	{3.0}	43.0	{2.5}
Service sector share in total employment	%	Predictive	31.3	{35.3}	{4.0}	34.	{3.5}
Spending on research and development as share of GDP	%	Predictive	1.3	2.0	{0.7}	1.75	{0.45}
<b>HUMAN AND SOCIAL DEVELOPMENT</b>							
Total population	Million	Binding	1,307.56	1,360	< 8‰	1,341.00	5.1‰
Urban share of total population	%	Predictive	43.0	47.0	{4.0}	47.5	{4.5}
Transfer of agricultural labour	Million	Predictive	–	–	{45.0}	–	{45.0}
Number of new urban jobs	Million	Predictive	–	–	{45.0}	–	{57.71}
Registered urban unemployment	%	Predictive	4.2	5.0	–	4.1	–
Average per capita urban disposable income	Yuan	Predictive	10,493	–	5.0	19,109	9.7
Average per capita rural net income	Yuan	Predictive	3,255	–	5.0	5,919	8.9
Proportion of rural population enrolled in new cooperative health system	%	Binding	23.5	>80.0	{>56.5}	96.3	{72.8}

<sup>18</sup> Thus, the 11FYP anticipated 'stable and relatively fast development' (*pingwen jiaokuai fazhan*). The language here is significant, 'stable' having been added to the corresponding phrase ('relatively fast') used in the 10th Five-Year Plan (2001–05).

<sup>19</sup> *Yiren weiben*.

Number of urban residents covered by basic pension insurance	Million	Binding	1.74	2.23	5.1	2.57	8.1
Average educational attainment	Years	Binding	8.5	9.0	[0.5]	9.0	[0.5]
<b>RESOURCES AND ENVIRONMENT</b>							
Guaranteed arable area	M ha.	Binding	122.0	120.0	[-0.3]	121.2	-0.13
Forest coverage rate	%	Binding	18.2	20.0	[1.8]	20.36	[2.16]
Increase in water efficiency coefficient in agricultural irrigation	%	Predictive	0.45	0.50	[0.05]	0.50	[0.05]
Reduction in water consumption per unit of industrial value-added	%	Binding	-	-	[30.0]	-	[36.7]
Reduction in energy consumption per unit of GDP	%	Binding	-	-	[c.20.0]	-	[19.1]
Comprehensive treatment rate of industrial solid waste	%	Predictive	55.8	[60.0]	[4.2]	69.0	[13.2]
Reduction in emissions of major pollutants: sulphur dioxide	%	Binding	-	-	[10.0]	-	[14.29]
chemical oxygen demand			-	-	[10.0]	-	[12.45]

Note: Figures in square brackets show cumulative percentage increase between 2006 and 2010.

Figures in curly brackets are interpolated estimates derived from planned rates of growth.

Rates of GDP and income growth are given in constant price terms.

Sources: CDT, *Twelfth Five-Year Plan*, pp. 5–6 and *Gangyao*, pp. 3–4.

The choice of targets was not coincidental. Those relating to growth and structural change presaged an intended slowing in the rate of expansion of the GDP<sup>20</sup> as the economy tilted more towards the service sector. Increasing the share of spending on R&D (research and development) in the GDP reflected the government's aspiration to move China up the value-added ladder.

As for social development indicators, maintenance of a *binding* target for population growth reflected a continuing commitment to the ethos of the one-

<sup>20</sup>By comparison, *realised* GDP and per capita GDP growth under the 10FYP were 9.6 per cent and 8.9 per cent per annum respectively (in constant price terms).



child family policy, and increasing urbanisation underlined the government's conviction that both economic and welfare goals would thereby be served. At the same time, the looked-for major expansion in urban *employment* dictated further large-scale transfers of agricultural workers to the urban sector. Welfare and economics were simultaneously embodied in 11FYP targets in order to enhance educational standards and to expand the reach of social welfare insurance.

It is noteworthy that although most targets relating to human and social development were predictive, government concern about the environmental costs of growth was reflected in the binding status of most environmental targets.

### 2.3 The 11FYP: outcomes

Judged by conventional standards, China's 11FYP was a definite success, not least when set against the interruption of the global financial crisis.<sup>21</sup> Major 11FYP achievements were as follows:

- GDP expanded, on average, by more than 11 per cent per annum; the corresponding figure for per capita GDP was 10.6 per cent.
- Both urban and rural residents benefited from continued economic expansion: annual urban disposable income growth was almost double the planned figure while net rural income also increased by a margin well in excess of what was planned.
- Almost 58 million new jobs were created in the urban sector, most of them filled by the 45 million rural residents (overwhelmingly farm workers) who left the countryside. As a result, far from increasing, the registered urban unemployment rate showed a marginal decline.
- There was a spectacular rise in basic health cover in the countryside: by 2010, almost all rural residents were enrolled in the rural cooperative health system, compared with less than a quarter in 2005. There are, however, major qualifications to this seemingly optimistic picture. One is that as local (provincial and sub-provincial) governments have carried the larger part of the funding burden, the quality of services varies

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<sup>21</sup> Although the global crisis did little to dent the momentum of GDP growth, it had a major effect on the drivers of growth, as investment took up the slack caused by the collapse of exports.

enormously among regions. Another is that the scale of funding available through the cooperative health system is frequently quite inadequate to meet the cost of needed care.

- The rate of increase in the number of urban residents with basic pension cover was also considerably higher than the planned figure.

Most resource conservation and environmental goals were also fulfilled:

- The planned reduction in water use by industry was exceeded by a sizeable margin.
- Energy consumption per unit of GDP also fell appreciably, basically (if not literally) fulfilling the 20 per cent target.
- Compared with the 10FYP period (2001–05), during which 6.2 million hectares of arable land were lost, in 2006–10 the rate of arable land contraction was minimised. Less than 1 million hectares were lost.
- The rate of forest cover increased above plan.<sup>22</sup>

The 11FYP period saw other successes too that are not captured in Table 1. For example:

- Government investment in agriculture rose substantially. The agricultural tax and other farm levies were abolished; more subsidies were extended to grain farmers. Grain production rose year on year to reach a record level of 546.4 million tonnes (2010), thereby enabling China to maintain 95 per cent self-sufficiency in cereals.
- Transportation infrastructure (roads, railways, port facilities) underwent notable expansion.
- Government spending on education increased, on average, by 22.4 per cent per annum, facilitating the establishment of a universal free urban and rural compulsory nine-year education system. Free secondary vocational education was also extended to students from low-income urban and poor rural households.

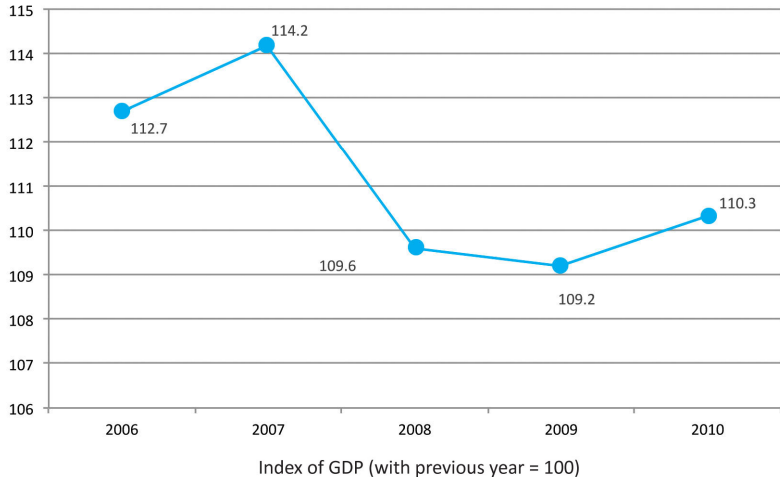
Although few quantitative targets remained unfulfilled at the end of 2010,<sup>23</sup> concealed within the superficially impressive official statistical 11FYP results were serious shortcomings.<sup>24</sup>

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<sup>22</sup>As the recent discussion of Sino Forest's reporting of forest stock has highlighted, these figures are extremely difficult to verify.

*Economic growth:* the planned reduction in GDP expansion was an acknowledgement that a slower pace of growth was justifiable if the quality of growth could be improved. But far from slowing, throughout the 11FYP period GDP growth was consistently well above the planned 7.5 per cent rate.

Figure 1: GDP growth under 11FYP



Source: NBS, *Zhongguo tongji zhaiyao* [China Statistical Abstract], 2011 (Beijing: Tongji chubanshe, 2011), p. 23.

*Economic rebalancing:* a central goal of the 11FYP was to shift China from the previous pattern of economic growth, in which investment and net exports were prime drivers of growth, to one in which domestic demand (above all, household consumption) would assume a much greater role. This goal was not fulfilled. On the contrary, during 2006–10, the contribution of consumption to GDP growth declined.

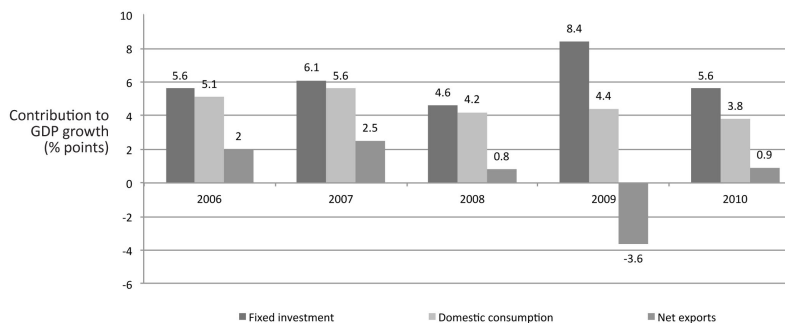
Because these figures include domestic and government consumption, they exaggerate the growth contribution of household demand. Thus,

<sup>23</sup>The point has been well made that ‘China’s system is good [at] meeting output goals, but less so at delivering structural change’ (Tom Miller, ‘NPC 2011 – A man, a plan, a Congress – Premier Wen’s policy promises’, *GaveKalDragonomics*, *DragonWeek*, 8 March 2011, p. 2 (available online only by subscription).

<sup>24</sup>See *China Daily*, 2 March 2011: ‘the nation still faces great challenges, including its economic reliance on investment and exports, its unbalanced development between urban and rural areas, and a widening wealth gap.’

NBS data show the share of household consumption in GDP to have fallen since 2006 (from 38 per cent to about 35 per cent).<sup>25</sup> The inference is clear: as of end-2010, the process of economic rebalancing had still not begun.

Figure 2: The share of fixed investment, domestic consumption and net exports in GDP growth under the 11FYP



Source: NBS, *Zhongguo tongji zhaiyao* 2011, p. 37.

*The search for more inclusive growth:* at the heart of the 11FYP's pursuit of greater sustainability was an aspiration to achieve more equal regional and sectoral income distribution. The evidence suggests that insufficient progress, if any at all, has been made in this direction. In nominal terms, the ratio between urban and rural per capita incomes in 2010 was virtually identical to that of 2005; in absolute terms, the gap widened, from 7,238 yuan to 13,190 yuan.<sup>26</sup> Recent estimates suggest that China's national Gini coefficient is now close to 0.5<sup>27</sup> – well above the international warning level of 0.4. Interprovincial gaps in both income and consumption also remain undiminished, even though GDP growth in inland China has exceeded that of the coastal provinces since 2007. In 2009, for example, households in only 10 provinces – with a single exception, all of them coastal – enjoyed consumption spending

<sup>25</sup> Note too that the planned rise in the service sector's share of both GDP and employment also remained unfulfilled at the end of 11FYP (see Table 1).

<sup>26</sup> *Zhongguo tongji zhaiyao*, 2011, p. 104.

<sup>27</sup> In March 2010, Justin Yifu Lin noted that China's Gini coefficient had reached 0.7 in 2007. See <http://blogs.worldbank.org/african/china-s-miracle-demystified>. A more recent Chinese source suggests that the figure could be as high as 0.48–0.49. (See Ru Xin et al. (senior editors), *2011 nian Zhongguo shehui xingshi fenxi yu yuce* [China's Social Situation: Analysis and Forecast (2011)], Shehui kexue wenxian chubanshe, 2011, p. 38.

that was above the national average.<sup>28</sup> And in three provinces<sup>29</sup> consumption spending was more than 40 per cent below the national average; and in another three it was at least 30 per cent below that figure.<sup>30</sup>

In short, the outcome of the 11FYP was mixed. Most of the quantitative targets, including those relating to environmental change, were fulfilled or overfulfilled. But such success was seriously undermined by a lack of progress in rebalancing the economy and by a failure to address widening wealth gaps and problems of unbalanced urban and rural development.

## 2.4 The impact of EU-China cooperation on the outcome of the 11FYP

The past decade has seen a change in emphasis in the thrust of EU-China cooperation. During the 1990s, the main focus of cooperative programmes was agriculture and infrastructure. By contrast, in the first half of the 2000s, the EU gave increasing support to social and economic reform, the environment and sustainable development, and good governance and the rule of law.<sup>31</sup> More recently still, cooperation has sought to underpin the many ongoing sectoral dialogues that take place between China and the EU as well as to embrace issues relating to energy development, environment and climate change and also human resources development.<sup>32</sup>

Attempting to assess, let alone to measure, the impact of the EU on the implementation and outcome of China's 11FYP is extremely difficult. In some respects, such an exercise seeks to answer a question that is misplaced. The time horizons of FYPs and EU-China cooperation programmes do not, are not

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<sup>28</sup> At the time of writing (September 2011), provincial estimates are not available for 2010. The provincial estimates for 2009, which are reproduced in full in Annex B, can be found in NBS, *Zhongguo tongji nianjian* [China Statistical Yearbook], 2010 (Beijing: Tongji chubanshe, 2010), pp. 61–62. The 10 coastal provinces include three municipalities (Beijing, Tianjin and Shanghai), all of which have provincial administrative status. Consumption spending in Beijing was twice the national average; in Shanghai the gap was threefold. The single non-coastal province was Inner Mongolia.

<sup>29</sup> Tibet, Guizhou and Gansu.

<sup>30</sup> Yunnan, Xinjiang and Jiangxi.

<sup>31</sup> For example, see EC, 'Country Strategy Paper: China, 2002-06, [http://eeas.europa.eu/china/csp/02\\_06\\_en.pdf](http://eeas.europa.eu/china/csp/02_06_en.pdf) (first accessed on 26 June 2011).

<sup>32</sup> EC, 'China Country Strategy Paper, 2007-13', available at [http://eeas.europa.eu/china/csp/07\\_13\\_en.pdf](http://eeas.europa.eu/china/csp/07_13_en.pdf) (first accessed on 26 June 2011).

meant to and almost certainly cannot be made to coincide. The fact they sometimes overlap affords an opportunity to try to forge a link between them,<sup>33</sup> although it is hard to demonstrate direct causality. In any case, sectoral policy dialogues are by their very nature ongoing exchanges that have an implicitly long-run orientation. As for cooperative programmes, their impact has often made itself felt most clearly at a *local* level. Translating local success to a national platform poses a major challenge both for the EU and the Chinese authorities.

Even more fundamentally, the outcome of an FYP overwhelmingly reflects the *internal* dynamics of policy implementation and the effectiveness of China's own implementive mechanisms. These internal dynamics embrace the reality of frequent sharp divergences between central government's strategic, long-term priorities and the short-term vested interests of local authorities, whether at provincial, prefectural or even township level. The chain of command that worked so effectively, even though to the massive detriment of incentives and efficiency, under the old central planning system has long disappeared. Binding orders from the centre can no longer be guaranteed to be carried out by local government officials, many of whom are engaged in corrupt dealings with businessmen and entrepreneurs. The lack of a robust legal framework and the existence of ill-defined property rights further complicate the situation.

In short, the Chinese central government faces profound systemic institutional constraints in its efforts to implement its highly rational and potentially effective economic and social policies. These constraints are reflected in problems that have confronted EU-China cooperation.<sup>34</sup> Finding a way of resolving these tensions has long been one of the biggest challenges facing Beijing. The persistence of such tensions helps to explain the 11FYP's failure to achieve more inclusive growth and to put in place a more balanced economic structure. It also remains a major obstacle to fulfilment of resource

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<sup>33</sup> Compare with the aspiration to link the EU's 7th Research and Technical Development Framework Programme to China's 11FYP. See Directorate-General for Research, 'Review of the Science and Technology (S&T) Co-operation between the European Community and the Government of the PRC', Final report, October 2008, [http://ec.europa.eu/research/iscp/pdf/china\\_eu\\_en.pdf](http://ec.europa.eu/research/iscp/pdf/china_eu_en.pdf) (first accessed on 26 June 2011), pp. 28–29).

<sup>34</sup> A 2006 country-level evaluation of the EU-China cooperation programme noted that 'concrete results have been limited by problems at the level of policy administration, implementation and enforcement. Many of these arise from poor governance.' EC, 'China Country Strategy Paper, 2007-13', p. 25. The same report proposed that 'the theme of governance should be better mainstreamed into all sectors.' *Ibid.*

conservation and environmental targets. In seeking to maximise the effectiveness of its sectoral policy dialogues and other forms of cooperation with China, the EU too faces a major challenge in its efforts to combat the disruptive effects of widespread corruption and an essentially dysfunctional system of governance.

## 3 The Twelfth Five-Year Programme of Economic and Social Development

### 3.1 The 12FYP: themes, goals and targets

Policy continuity is very evident between the 11th and the 12th FYPs. Both Programmes are premised on pursuit of 'scientific development'; both aspire to achieve 'steady, fairly rapid' GDP growth; and both endorse the principle that such growth should translate into higher living standards, the benefits of which should be distributed more equally among the Chinese population.

But there are also significant differences in emphasis between the two documents, reflecting the changed context in which the 12FYP has been launched:

- The global crisis and its aftermath affected China profoundly. Although trade with the EU, the US and Japan has recovered from the downturn in 2009,<sup>35</sup> the potential threat of disruption from future financial instability has underlined the urgency of economic rebalancing as a means to enhance the role of domestic consumption as a driver of growth.
- Another effect of the global crisis was to strengthen the role of fixed investment as a driver of growth as a result of the massive fiscal and monetary stimulus package launched by China. Many regard that level of investment to have reached an unsustainable level, further strengthening the case for economic rebalancing.

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<sup>35</sup> NBS statistics show that China's merchandise trade with all three countries reached a record level in 2010. See NBS, *Zhongguo tongji zhaiyao*, 2011, p. 71.

- The past five years have seen China moving closer to the ‘Lewisian turning point’,<sup>36</sup> as the reservoir of underemployed surplus farm workers has sharply contracted. The resulting upward pressure on wages promises to stimulate an expansion of domestic demand. It also reinforces the need to shift towards higher value-added activities as China’s comparative advantage begins to move towards more capital- and technology-intensive products.
- For many years, China benefited from a ‘demographic dividend’, characterised by a low dependency ratio alongside a high share of potentially productive 15- to 60-year-olds in the population. That era is now ending. China’s work force will peak, perhaps as early as 2016. And as ageing accelerates, caring for the elderly will become a major financial burden at a time when other social insurance demands are also rising sharply.

All these factors are reflected in the new Five-Year Programme, and help to explain some of its major policy thrusts.

The 12FYP is a more detailed development blueprint than its predecessor. It contains more chapters, more targets and more prescriptive comments. In order to reach a new trajectory of sustainable development, in addition to maintaining ‘steady, fairly rapid’ growth, it lists the following core objectives:

- to enhance the competitiveness of the manufacturing industry in a restructured economy that gives greater weight to the service sector;
- to achieve more balanced urban and rural growth through accelerated urbanisation;
- to achieve more balanced development between regions of China;
- to raise educational standards and to strengthen the role of science and technology (S&T) in support of economic modernisation;
- through job creation, more equal income distribution and the provision of comprehensive social welfare insurance services, to translate

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<sup>36</sup>In his seminal 1954 article (‘Economic development with unlimited supplies of labour’), W. Arthur Lewis showed how the transfer of cheap surplus labour from agriculture could be used to drive industrial growth in a nascent capitalist sector without bringing undue pressure to bear on industrial wages. Only when the reservoir of surplus farm labour begins to be exhausted (i.e., when the ‘Lewisian turning point’ is reached) would competition for labour precipitate an increase in industrial wages.



economic growth into improved living standards and levels of welfare for all urban and rural residents;

- to make better use of resources and to protect the environment through implementation of measures designed to conserve energy, reduce greenhouse gas (GHG) emissions and address problems of climate change; and
- to harmonise population growth and economic development.

It deserves stating too that the fulfilment of these goals will facilitate the realisation of a major longer-term goal that the CCP has committed itself to meeting by 2020: the attainment of a 'comfortably well-off' (*xiaokang*) society.

The quantitative targets listed in the 12FYP are reproduced in Table 2.

Table 2: Goals and targets of China's 12FYP

Indicator	Unit	Nature of target	Plan		
			2010	2015	Growth p.a. (%)
<b>ECONOMIC GROWTH AND STRUCTURE</b>					
GDP	M yuan	Predictive	3,980	5,580	7.0
Service sector share in total value-added	%	Predictive	43.0	47.0	[4.0]
Spending on research and experimental development as share of GDP	%	Predictive	1.75	2.20	[0.45]
<b>HUMAN AND SOCIAL DEVELOPMENT</b>					
Total population	Million	Binding	1,341	< 7.2%	1,390
Urban share of total population	%	Predictive	47.5	51.5	[4.0]
Number of new urban jobs	Million	Predictive	–	–	[45.0]
Registered urban unemployment	%	Predictive	4.1	< 5.0	–
Average per capita urban disposable income	Yuan	Predictive	19,109	>26,810	>7.0
Average per capita rural net income	Yuan	Predictive	5,919	>8,310	>7.0
Number of urban residents covered by basic pension insurance	Million	Binding	2.57	3.57	[1.00]
Participation rate for urban and rural residents in basic medical insurance	Years %	Binding Binding	9.0 –	[0.5] –	9.0 [3.0]
Average life expectancy	Years	Predictive	73.5	74.5	[1.0]

SCIENCE AND TECHNOLOGY, EDUCATION					
Consolidation rate of nine-year compulsory education	%	Binding	89.7	93.0	[3.3]
Gross enrollment rate in senior high school education	%	Predictive	82.5	87.0	[4.5]
Spending on R&D as share of GDP	%	Predictive	1.75	2.20	[0.45]
Patents per 10,000 population	Unit	Predictive	1.7	3.3	[1.6]
RESOURCES AND ENVIRONMENT					
Guaranteed arable area	M ha.	Binding	121.2	121.2	[0]
Forest cover					
Forest coverage rate	%	Binding	20.36	21.66	[1.3]
Forest stock	Million	Binding	13,700	14,300	[6.0]
Increase in water efficiency coefficient in agricultural irrigation	m <sup>3</sup>	Predictive	0.50	0.53	[0.03]
Reduction in water consumption per unit of industrial value-added	%	Binding	–	–	[30.0]
Reduction in energy consumption per unit of GDP	%	Binding	–	–	[16.0]
Share of non-fossil fuels in total primary energy consumption	%	Binding	8.3	11.4	[3.1]
Rate of decrease in carbon dioxide emissions per unit of GDP	%	Binding	–	–	[17.0]
Reduction in emissions of major pollutants:	%	Binding			
chemical oxygen demand			–	–	[8.0]
sulphur dioxide			–	–	[8.0]
ammonia nitrogen			–	–	[10.0]
nitrogen oxides			–	–	[10.0]

Note: GDP and per capita income estimates, including projected growth rates, are calculated in terms of 2010 prices. Figures in square brackets show the projected cumulative percentage increase between 2011 and 2015. Participation rates in basic medical insurance refer to members of the registered urban work force and non-working urban residents, as well as for rural residents enrolled in the new cooperative health system.

Sources: CDTD, *Twelfth Five-Year Plan*, pp. 14–16 and *Gangyao*, pp. 10–11.

Of the 24 targets listed in the 12FYP, only four – two fewer than in the 11FYP – relate explicitly to economic growth and economic structure, although a further four address education, science and technology. By contrast, eight targets relate to resource use and environment, and nine to human and social

development. The disproportionate emphasis on resource, environmental and social development indicators signals the government's determination to shift towards a more inclusive, balanced and sustainable growth model.

This emphasis is clear in the greater weight attached to binding targets in the human, social, environmental and resource categories compared with those relating to economic growth and structural change.<sup>37</sup> As well as highlighting the priority economic and social goals of the new Programme, the designation of binding targets also has important implications for *political* preferment, because the extent to which such targets are fulfilled will shape the promotion prospects of officials at all levels of government.

Important aspects of the new Programme are examined in detail in later sections of this paper. Here we highlight a few of the key tasks to which the 12FYP addresses itself.

Energy, environment and climate change: energy and environmental issues were a high priority in the 11FYP. The 12FYP reaffirms their importance, but also broadens their scope (especially in the unprecedented attention it gives to climate change).<sup>38</sup> Existing efforts to promote low-carbon technology will be strengthened.<sup>39</sup> Non-fossil fuels are expected to rise sharply in consumption and to account for 11.4 per cent of total energy use by 2015.<sup>40</sup>

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<sup>37</sup> More than half of all 12FYP targets are binding, compared with little more than one-third in the 11FYP.

<sup>38</sup> The 12FYP contains two new pollution targets, relating to reductions in pollution from ammonia nitrogen and nitrogen oxides.

<sup>39</sup> See also Barbara Finamore and Michael Davidson, 'China's Twelfth Five-Year Plan: Energy and Environment Positioned Strategically', China-US Focus, 29 March 2011, available at <http://www.chinausfocus.com/energy-environment/china%E2%80%99s-twelfth-five-year-planenergy-and-environment-positioned-strategically/> (accessed on 1 July 2011).

<sup>40</sup> Longer-term plans call for the corresponding figure to reach 15 per cent by 2020. Specific plans include the construction of new nuclear power plants in central and western China, with an installed capacity of 40 million Kw; large-scale hydropower projects in southwest China; major wind power plants in coastal regions and offshore; and solar energy power stations in Inner Mongolia and western China. See CDTD, *Twelfth Five-Year Plan*, Ch. 11, especially Table 6, pp. 52–53 and *Gangyao*, Box 6, pp. 35–36.

The 12FYP was approved at almost exactly the time that Japan's Fukushima nuclear disaster occurred, after which new approvals in China were put on hold. It seems most likely that the Chinese government has little option but to allow the nuclear programme to resume, although it may proceed more slowly and with fewer construction projects in inland locations (especially areas considered to be susceptible to earthquakes).

Development of strategic industries: the 12FYP prioritises the development of seven ‘strategic emerging industries’, whose economic contribution is planned to quadruple and reach 8 per cent of GDP by 2015.<sup>41</sup> The choice of industries<sup>42</sup> reflects the priorities of the new Programme: collectively they promise to lend support to the fulfilment of China’s sustainable development aspirations and to facilitate its ascent of the value chain.

Service sector expansion: in line with efforts to create a more rational economic structure that accommodates China’s strategic objectives, the 12FYP calls for the share of services in the GDP to reach 47 per cent in 2015 (in 2005, the corresponding figure was 40.5 per cent). Policy and institutional initiatives designed to facilitate this process include efforts to expand key service industries (financial, business, logistical and high-tech services) and also measures to upgrade the service sector and make it more competitive. Henceforth, the service sector will have first claim on land that is no longer needed for industrial purposes.

Raising consumption: at the heart of the 12FYP agenda is a renewed determination to raise the share of consumption in GDP – above all, by increasing personal consumption spending by domestic households. Thus, the 12FYP’s calls for rises in disposable income, large-scale job creation, tax reform, accelerated urbanisation, the provision of more social housing and extended social welfare coverage. The anticipated increase in consumer demand will be met by both domestic and overseas producers.

Pursuit of more inclusive growth: allied to efforts to rebalance the economy by raising consumption is a resolve to ‘put people first’ in order to halt and reverse intersectoral and interregional income and

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<sup>41</sup>The seven industries currently contribute 2 per cent of China’s GDP. See KPMG Advisory (China) Limited, ‘China’s 12th Five-Year Plan: Overview’, available at <http://www.kpmg.com/CN/en/IssuesAndInsights/ArticlesPublications/Publicationseries/5-years-plan/Documents/China-12th-Five-Year-Plan-Overview-201104.pdf> (accessed on 2 July 2011).

<sup>42</sup>Namely new energy sources (e.g., nuclear, solar and wind power and biomass energy); energy conservation and environmental protection; new-generation information technology [IT] (Internet and mobile communication, network convergence etc.); biotechnology (e.g., bio-agriculture, bio-pharmaceuticals, bio-medical engineering products); new materials, including rare earth and semiconductor materials); high-end equipment manufacturing (e.g., aerospace, telecommunications, remote sensing and high-speed rail transport); and new-energy car industry (CDDT, *Twelfth Five-Year Plan*, Ch. 10., esp. Table 5, pp. 48–49 and *Gangyao*, Box 5, pp. 32–33).

consumption gaps.<sup>43</sup> Tax reforms, continued subsidy payments to farmers and investment promotion are intended to help fulfil this core objective.

### 3.2 China's 12FYP: substance or rhetoric?

The reaction in some quarters to China's latest Development Programme has been one of scepticism. The reservations derive in large part from the many similarities between the 11FYP and the 12FYP. Is it not, the argument goes, merely a case of *plus ça change*?<sup>44</sup> In view of the previous FYP's failure to curb growth and to attain a more sustainable development trajectory, why should the current Programme be taken at face value?

That the 12FYP document is quite heavily loaded with rhetoric is undeniable. But behind the rhetoric lies serious meaning and intent. The change in mindset that has consistently informed the social and economic development strategy of the Hu Jintao-Wen Jiabao administration is a coherent and logical response to the problems arising from the first two decades of reform.<sup>45</sup> The similarities between the 11th and the 12th Programmes are indeed striking. But shifting to a new development trajectory is a long-term process.<sup>46</sup> Given the failure of the 11FYP to make significant progress towards economic rebalancing and the attainment of more inclusive growth, it is not surprising that there should be such a high degree of overlap between it and the new Programme. The more striking feature of the 12FYP is its even stronger sustainability credentials, as seen in its even greater emphasis on the need for economic rebalancing, greater energy efficiency and environmental enhancement.

It deserves stating as well that the formulation of China's latest Development Programme owes more to consultation than any previous FYP. Such

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<sup>43</sup> Economic differentials in China have been widening steadily since the mid-1980s.

<sup>44</sup> For example, writing about the 12FYP 'Proposal', submitted to the CCPC in October 2010, a senior analyst suggested that the Programme 'breaks no new ground, and provides little concrete guidance'. Barry Naughton, 'What Price Continuity?', *China Leadership Monitor*, No. 34, Hoover Institution, Stanford University, February 2011, p. 3, available at <http://media.hoover.org/sites/default/files/documents/CLM34BN.pdf> (first accessed on 27 June 2011).

<sup>45</sup> The logic of China's pursuit of more sustainable development has been strengthened by the global recession; and, at the time of writing, its good sense is underlined by America's debt problems and the downgrading of its credit rating, as well as by the Eurozone debt crisis.

<sup>46</sup> As we have argued above, FYPs should also be seen as part of a planning process whose horizons go beyond a mere five years (see I.ii).

consultation has not been an empty gesture. Indeed, it is reported that some 38 changes were made to the 12FYP<sup>47</sup> following its discussion by NPC delegates, whose final endorsement, as China's legislature, was required in order that the Programme could be translated into formal policy.

In short, the 12FYP is *not* mere rhetoric. Nor are China's leaders and policymakers using it as a cover behind which they seek to maintain the previous growth maximisation imperative. Yet to argue in favour of the logic of China's current Development Programme is not to deny the formidable difficulties that its implementation will no doubt encounter. The challenges of implementation are addressed in the next section.

### 3.3 Implementing the 12FYP: challenges

The most fundamental challenge facing Beijing is that of implementation and compliance. Various factors make implementation difficult. They include the nature of organic social and economic developments, the need for reform of government structures in some regions, interministerial conflicts of interest and the complex nature of relations between central and provincial levels of government. Reference has already been made to the fragmented, even dysfunctional nature of Chinese governance. For many years now, the central government has found it difficult to ensure that its policy scope extends to provincial and lower-level governments. Indeed, the overfulfilment of the 11FYP's GDP growth target by such a wide margin seems largely attributable to the central government's failure to accommodate the interests and/or to rein in the expansionary ambitions of individual provinces.

The problem of compliance is suggested in a comparison of the national growth target for 2011–15 in the 12FYP and the corresponding targets set by *provincial* authorities. It reveals alarmingly wide disparities between the growth aspirations of the two levels of government. In contrast to the national GDP growth target of 7 per cent per annum, not one province has listed a planned growth rate of below 8 per cent during the 12FYP period. In fact, the average for all provinces lies between 11 per cent and 12 per cent.<sup>48</sup> Although Guangdong, Jiangsu and Shandong have lowered their planned rates of GDP

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<sup>47</sup> For more on the 38 changes to the draft, see Hong Kong, *Ta Kung Pao*, 14 March 2011, available at <http://www.takungpao.com/news/china/2011-03-14/625544.html> (originally accessed on 15 March 2011).

<sup>48</sup> In Anhui and Heilongjiang, planned GDP growth was set at 15 per cent per annum.

growth, it is striking that the revised targets, ranging between 8 per cent and 10 per cent, still clearly exceed the 7 per cent national 12FYP target.<sup>49</sup> Growth in Guangdong, Jiangsu and Shandong, provinces that have already broken through to middle-income status, has slowed in recent years.<sup>50</sup> They now enjoy greater flexibility in setting growth rates than do their poorer counterparts, where the aspiration for high growth is still strong. Thus, most provinces are said to have set double-digit growth targets for the 12FYP period, to the detriment of progress in meeting energy, environmental and resource use targets, according to Zhang Ping, Director of the NDRC.<sup>51</sup>

Resolving the tensions inherent in the conflicting interests of central government and local governments is one of the most critical challenges facing Beijing in the coming five years. Success in this regard will require the establishment of monitoring, reporting and incentive mechanisms with in-built capacities both to control and to incentivise local officials in accordance with the priorities set by central government. If, for example, the government can put in place an even more effective incentive framework than already exists to ensure that officials who meet rebalancing targets are rewarded more handsomely (for example, through accelerated promotion) than those who merely pursue faster growth, then an important step forward will have been taken.

These considerations are also relevant to an assessment of the role of market forces in driving economic change in China over the next five years. Under the impact of three decades of reforms, the role of market forces has increased substantially. However, one of the effects of the global financial crisis was to reassert the role of centralised and administrative mechanisms in guiding the economy. There seems no reason to suppose that the 12FYP period will see a pronounced extension of market forces. Further market liberalisation would, in fact, probably serve to intensify central-local tensions to the detriment of fulfilling centrally determined economic goals. But those who argue that the reassertion of state authority in the Chinese economy is 'squeezing out' the

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<sup>49</sup> *China Daily*, 14 February 2011.

<sup>50</sup> In 2010, the annual GDP growth rate was 12.2 per cent for Guangdong, 12.5 per cent for Shandong and 12.6 per cent for Jiangsu – rates that were exceeded in 18 other provinces. NBS, *Zhongguo tongji zhaiyao*, 2011, p. 28.

<sup>51</sup> *China Daily*, 26 January 2011.

private sector<sup>52</sup> exaggerate the likely future role of central government. The private sector has been such a potent driver of China's economic growth, and will continue to be,<sup>53</sup> that encroachment on its activities will be limited. For the foreseeable future, therefore, the state will loom large as a shaper of strategy and a source of strategic investment, but economic change will continue to reflect the combined impact of market and state-led administrative policy instruments. So much seems clear from statements made by Premier Wen Jiabao in March 2011 in his government report. In this, he insisted that 'sound market forces and effective macro-control are both indispensable parts of the socialist market economy' and called on those responsible for implementing policy to 'closely integrate government control with market forces'.<sup>54</sup> The message implicit in Wen's remarks is that the market will be allowed to guide resource allocation but that administrative fiat and quantitative targets will continue to be used in an attempt to shape growth and the direction of structural change.

The second year of the 12FYP (autumn 2012) will also coincide with a change in China's leadership in the form of the transition to the 'Fifth Generation' of Party leaders. The political succession is not addressed in the 12FYP, and it is beyond the scope of this paper. The likelihood is that the transfer of power will take place smoothly and that the 'Fifth Generation' of Chinese leaders will continue to endorse the broad development strategy in the 12FYP. Key members of this generation are members of the current Politburo, and they participated in setting the CCP's framework for the Twelfth Programme.<sup>55</sup> In particular, Li Keqiang, as the Politburo member in charge of macroeconomic development and the likely future premier, is believed to have played a leading role in

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<sup>52</sup> See, for example, Patricia Adams, 'Private sector is being squeezed out as "the state advances"', *Financial Post*, 26 June 2011, available at <http://opinion.financialpost.com/2011/06/23/nationalizing-china/#more-15670> (accessed on 29 July 2011).

<sup>53</sup> To give just one example: under the 12FYP in the priority healthcare sector, barriers to private investment will be further reduced and private investment will be a major driver of expanded healthcare services.

<sup>54</sup> The full text is at [http://news.xinhuanet.com/english2010/china/2011-03/15/c\\_13779521\\_8.htm](http://news.xinhuanet.com/english2010/china/2011-03/15/c_13779521_8.htm) (accessed on 26 July 2011).

<sup>55</sup> Xi Jinping and Li Keqiang are members of the Politburo Standing Committee.



drafting the 12FYP.<sup>56</sup> Substantial policy continuity through the 2012–13 leadership transition can therefore be expected. This is not to deny the possibility, following the precedent of previous political leadership transitions in China, that once settled into their new roles, the new generation of leaders will determine their own priorities and policy emphases. Radical change will be difficult, but new emphases or new policies could be adopted through the mid-term review of the 12FYP, the evolution of policy priorities set out in annual work reports or the need to respond to new situations, either domestic or global.

As its title makes clear, the 12FYP is primarily concerned with issues of economic and social development. In two of its sections, however, the Programme does also touch on domestic political issues.<sup>57</sup> Its material on the political and legal systems and the 'fight against corruption' reflects existing policy frameworks; and, in our view, there is nothing in the programme itself to suggest any significant or substantial political change in China during the next five years, including in areas such as human rights and democratisation. This may limit the scope for substantive EU engagement with China in these areas. The implicit message is that the Party is determined to retain its leadership role. The programme also includes some interesting discussion of 'social management' issues (see Box 1).

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<sup>56</sup> In February 2010, *Qiushi* ('Seeking Truth', the official mouthpiece of the CCPC and the Central Party School) published the text of a speech by Li Keqiang entitled 'On a number of questions relating to adjusting the economic structure and accelerating sustainable development'. (The Chinese-language text of the written version of Li's speech can be found at <http://blog.chinatells.com/wp-content/uploads/2010/07/Li-Keqiang-Qiushi-June-2010.pdf>.) The content of his speech makes clear his support of the policies of Wen Jiabao in favour of economic rebalancing and the pursuit of more inclusive growth.

<sup>57</sup> See especially CDTD, *Twelfth Five-Year Plan*, Ch. 54, 'Develop Socialist Democratic Politics', pp. 219–20 and *Gangyao*, pp. 136–37.

## Box 1: Social management

Section 11 of the 12FYP, on ‘social management’, focuses on the need to improve governance. As a commentary by a senior official on the role of social management in the 12FYP makes clear, concealed in this is great concern about the implications of rapid social and economic change for social stability – and, by implication, for the maintenance of the Party’s ultimate political authority. The urgency of the issues is underlined by the increasing ‘contradictions’ of unbalanced development, the challenge posed by the spread of social communication networks (both domestically and between China and the outside world) and Chinese citizens’ growing awareness of their rights.

The 12FYP includes references to ‘effectively preventing and resolving social contradictions caused by labour disputes, land reclamation, environmental pollution, [problems with] food and medicine safety, enterprise reorganisation, mining [accidents], etc.’. Four specific problems are identified as requiring more detailed attention:

- Improving the safety of food and medicine;
- Dealing strictly with industrial and workplace safety (hence two 12FYP targets: to reduce the death rate per unit of GDP by 36 per cent and to reduce the death rate in mining and industry by 26 per cent);
- Enhancing the capacity to deal with ‘sudden incidents’; and
- Improving systems for the prevention and control of threats to public order.

The 12FYP refers to the need to strengthen social management institutions, such as street committees, and to the importance of both prevention and peaceful reconciliation of conflicts. There are references as well to strengthening the provision of public services, building a service-orientated government, reducing the frequency of social incidents, resolving social contradictions expeditiously and encouraging leading cadres to deal directly with the masses.

## 3.4 China’s 12FYP and the EU’s Europe 2020

In one sense, a comparison of China’s 12FYP and the EU’s *Europe 2020* is artificial. Each document was formulated independently and in response to quite different circumstances. The 12FYP is part of a continuum of planning documents, each of which builds on the policies, achievements and failures of its predecessor. By contrast, *Europe 2020* is a stand-alone document, with a longer (10-year) time horizon, designed to articulate a response to the exigencies of the global financial crisis. Even allowing for rhetoric, the opening paragraphs of the two documents highlight the different contexts in which they

were formulated. The tone of the 12FYP is one of optimism borne of past success:

The Eleventh FYP period was truly extraordinary in the history of our country's development. ... We effectively dealt with the enormous impact of the global financial crisis, and maintained the good situation of steady and rapid economic development ... [We] accomplished the major goals and tasks set forth in the Eleventh FYP. ... Considerable progress was made in socialist economic, political, cultural, social as well as ecological development; and we wrote a new chapter in the cause of socialism with Chinese characteristics....<sup>58</sup>

By contrast, that of its EU counterpart is more foreboding:

The recent economic crisis has no precedent in our generation. The steady gains in economic growth and job creation witnessed over the last decade have been wiped out. ... The crisis has been a huge shock for millions of citizens and it has exposed some fundamental weaknesses of our economy. ... The crisis has also made the task of securing future economic growth much more difficult. The still fragile situation of our financial system is holding back recovery as firms and households have difficulties to borrow, spend and invest. Our public finances have been severely affected... Our growth potential has been halved during the crisis.<sup>59</sup>

Nevertheless, there *are* overlaps between the two strategies. Most strikingly, the three priorities set out in *Europe 2020* – the simultaneous pursuit of smart growth, sustainable growth and inclusive growth – are echoed in China's 12FYP. So are the policy prescriptions that emerge from them: the need to address environmental concerns through more effective energy R&D in order to maximise the benefits of knowledge and innovation; and the need to combat poverty and to ensure that the benefits of growth are distributed more equally.

These are important shared policy emphases. In particular, they promise to lend added momentum to ongoing sectoral dialogues and other exchanges. However, it would be harder to argue that the publication of *Europe 2020* has materially changed the commercial and other opportunities inherent in 12FYP.

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<sup>58</sup> CDTD, *Twelfth Five-Year Plan*, Ch. 1, p. 4 and *Gangyao*, pp. 2–3.

<sup>59</sup> *Europe 2020*, p. 5.

## 4 The 12FYP and International Relations, with Particular Reference to the EU

The 12FYP has important implications for China's international relations, including its relations with the EU. The principal message conveyed in the Programme is encapsulated in the heading of Section 12: 'Create a Win-win Situation: Raise the Level of Opening Up'.<sup>60</sup>

Much of the material in that section is concerned with global trade and investment, and it is considered in a later section of this paper (see Section 8, on the commercial implications of the 12FYP). But there is also a short section that refers to and examines China's 'positive' participation in global economic governance, primarily through the G20 framework, and also considers issues related to regional cooperation. The immediate background to Chinese thinking on such issues is the recent global financial and economic crisis. The dominant view that has emerged in China – no doubt strengthened by recurring US and Eurozone debt issues – is that such events may have marked the end of a post-war era dominated by Bretton Woods institutions and the G8.

The primary mechanism for global economic governance envisaged in the 12FYP is the G20. This is an attractive mechanism for Beijing, not only because it gives China a more prominent role than would be possible in the G8 framework but also because in the G20 China stands *alongside* other large countries rather than in front of them. As such, the arrangement accommodates China's policy rhetoric of 'equality' (or 'democracy') in international affairs.<sup>61</sup> Although there has been talk about the possible emergence of a 'G2' of China and the United States, Premier Wen Jiabao has made it clear that China is not interested in the development of such a structure.<sup>62</sup> This does not mean that global institutional mechanisms other than G20 are irrelevant. For example, there is nothing in the 12FYP to suggest any change in China's current policy of constructive engagement with the World Trade Organization (WTO) or the United Nations.

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<sup>60</sup> These paragraphs are based on Section 12 of the 12FYP (chapters 50–53). There is also material on 'national defence' (Section 15, or chapters 59–60, of the 12FYP), which is beyond our remit.

<sup>61</sup> For example, see Hu Jintao's speech at the 17th Party Congress in 2007 for an exposition of some of these themes.

<sup>62</sup> 'Wen: China disagrees to so-called G2, calling for effort to fight protectionism', *People's Daily*, 18 November 2009 (<http://english.peopledaily.com.cn/90001/90776/90883/6817072.html>).

The use of the word 'positively' to describe China's participation in economic governance is also significant. It points to a more active role for China at a time when its foreign policy élite is becoming more aware of growing expectations vis-à-vis China throughout the world and suggests that more proactive approaches by Chinese policymakers will gradually emerge. Chinese leaders have stressed their intention to behave responsibly and to promote global financial and economic stability.<sup>63</sup> Recent support for the Eurozone through the announcement of an intention to make bond purchases can be seen as an example.<sup>64</sup> Nonetheless, there is an element of gradual revisionism to the policy outlook,<sup>65</sup> most evident in references to promoting reform of the international economic system in order to make it more 'just and rational'.

The discussion of regional cooperation is quite limited. China remains officially supportive of the Doha Round,<sup>66</sup> but this is not mentioned in the 12FYP, where the emphasis is on the potential benefits of the further development of regional free trade arrangements. The particular priority focus here is China's relations with its immediate neighbours in East and Southeast Asia, these being the only regions mentioned by name in this part of the 12FYP. The inference appears to be that, by contrast, Europe is not such a high priority for Beijing.

More widely, at the macro-level of a diplomatic and trade policy that increasingly has global reach, the 12FYP suggests that the Chinese government will seek to look at the world in terms of *regions* (Europe, Africa, the Middle East etc.), but again with a priority focus on neighbouring areas. This, in turn, suggests that Europe will more and more be viewed from Beijing as just one of a number of regions of the world with which China deals, rather than be accorded the priority it might have enjoyed in, say, the 1990s, when a major

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<sup>63</sup> 'The world should not fear China', Li Keqiang, *Financial Times*, 9 January 2011.

<sup>64</sup> However, as Francois Godement and others have noted, the precise extent of Chinese bond purchases in Europe is unclear. They recommend the development of a coordinated system for the purchase of government bonds in Europe. Francois Godement and Jonas Parello-Plesner with Alice Richard, 'The Scramble for Europe', European Council on Foreign Relations, available at [www.ecfr.eu](http://www.ecfr.eu).

<sup>65</sup> 'Revisionism' refers to a foreign policy approach that seeks to change the way the current international system is structured, in contrast to a 'status quo' approach, which supports the maintenance of the existing system.

<sup>66</sup> This was made clear at the December 2010 Third Meeting of the EU-China High-level Economic and Trade Dialogue (Memo 10/698, available at the website of the European Commission).

See, for example

<http://europa.eu/rapid/pressReleasesAction.do?reference=MEMO/10/698&format=HTML&aged=0&language=EN&guiLanguage=en>.

goal of Chinese policy was to attract FDI from developed countries and to prepare for admission to the WTO.<sup>67</sup> Chinese approaches to Europe set out elsewhere emphasise the need to strengthen cooperation,<sup>68</sup> but there is generally less detail than in corresponding material about China's relations with East Asia or the US.

The dynamics of China's steady integration into the global economy are likely to keep changing as China's relative economic and political weight in the world continues to rise. And this trend will be reinforced during the coming five years by a gradually more proactive Chinese approach to the global economy and other global affairs. As this process takes place, Europe's ability to set and shape the agenda will decline.

It is incumbent on the EU to maintain and develop proactive dialogue with China on issues of global economic governance, with particular attention to the role of the G20. Wherever possible, this should be backed up by efforts to define common positions within the EU, as China seeks to deal with the EU as a region in its pursuit of global economic governance.<sup>69</sup>

## 5 The Regional Perspective: The 12FYP and China's Changing Economic Geography

### 5.1 Regional policy: themes and guidelines

Two factors have helped to shape the strong coastal bias of China's recent growth trajectory. The first has been the historical legacy of a more developed physical, economic and social infrastructure in a number of coastal regions. The second has been the relative ease with which, once China decided to open up to the outside world, coastal provinces could integrate with regional and global economies.<sup>70</sup> When reforms took hold in the 1980s, this both encouraged and facilitated a high degree of concentration of investment, including FDI, in these

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<sup>67</sup> As we comment in Section 8 on the commercial implications of the 12FYP, the EU's share of FDI into China and trade with it has been in decline since the 1990s.

<sup>68</sup> For example, at the High-level Economic and Trade Dialogue.

<sup>69</sup> The most recent statement of how the Chinese government views its emerging role in the world is in the State Council's White Paper 'China's Peaceful Development' of September 2011. See [http://www.gov.cn/english/official/2011-09/06/content\\_1941354.htm](http://www.gov.cn/english/official/2011-09/06/content_1941354.htm) (accessed on 5 October 2011).

<sup>70</sup> Despite its coastal location, Guangdong was one of China's poorer, slower-growing provinces before the 1980s. It is telling too that between the 1950s and the 1970s, GDP growth in western China was as rapid as in eastern coastal regions.

regions. In particular, the increasing export orientation of China's growth strategy favoured the emergence of three core regional growth hubs, centred on the Yangtze and the Pearl River deltas and the Bohai Gulf region. Their economic performance has served China well, but at the expense of widening interregional income disparities. Accordingly, in recent years the attainment of a more balanced regional pattern of development has become part of the mantra of sustainability under Hu Jintao and Wen Jiabao.<sup>71</sup>

The 12FYP<sup>72</sup> reiterates the need to achieve more coordinated development between the various geographical regions of China, as well as to promote 'healthy' urbanisation.<sup>73</sup> Efforts to halt and reverse widening interregional and intersectoral development disparities are driven in part by internal security considerations. But another important driver is the macro-goal of putting in place a 'comfortably well-off' (*xiaokang*) society throughout China. Both speak to enhancing development and welfare levels in areas of western China, some of which have large ethnic minority concentrations.

Three main themes emerge from the 12FYP:

- to promote development that is appropriate to the resource endowment and economic conditions of each region in order to help reduce development gaps between and within regions, as well as between urban and rural sectors;
- to make the most rational and effective use of limited land resources, especially in support of fulfilling agricultural and environmental goals;<sup>74</sup> and
- to continue to promote urbanisation.

Fulfilment of these plans promises to generate significant changes in the structure of China's economic geography, in terms not only of the balance between regions but also of the concentrations of urban clusters and main

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<sup>71</sup> Note, however, that the 'Open up the West' initiative (*xibu da kaifa*) was launched under the administration of Jiang Zemin and Zhu Rongji and was shaped by structural factors that transcend leadership agency.

<sup>72</sup> See CDTD, *Twelfth Five-Year Plan*, chs 18–20 and 79–93 and *Gangyao*, pp. 51–61.

<sup>73</sup> The process of urbanisation is relevant to a wide range of policies and trends, including demographics, industrialisation and public service provision for migrant workers etc., and they are touched on elsewhere in this paper.

<sup>74</sup> The direct implications of this for the EU are limited, and this aspect is not examined in any detail in this paper.

transport arteries.<sup>75</sup> These changes will create new opportunities for EU engagement with China.

The framework in which the regional development plans are set is that of the four familiar ‘mega-regions’: eastern, northeastern, central and western China.<sup>76</sup> Continuity of policy is evident in the priorities that are laid out, which are as follows:

- to promote a new round in the policy of ‘Opening Up the West’ as the highest priority;<sup>77</sup>
- to stimulate development in the northeast and the ‘old industrial base areas’;
- to promote the rapid rise of the central regions;
- to support the leading development role of the eastern regions;
- to strengthen support for the ‘old revolutionary, ethnic minority, border and poverty-stricken’ areas of the country.

Major policy instruments intended to facilitate accelerated growth in inland regions of China include increased investment in hard and soft infrastructure – most notably, in transport and education – implementation of more effective land-use policies and also tax reform. In many areas, for example, corporate income tax has already been reduced, and these reductions are set to continue in force.<sup>78</sup> A major priority will be to improve the investment environment in order to facilitate increased private domestic and foreign investment. The 12FYP is at pains to find ways of encouraging FDI into the central and western regions, but the northeast is not explicitly included as a priority destination for

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<sup>75</sup> For details of anticipated changes in the wake of continuing urbanisation under the 12FYP, see CDTD, *Twelfth Five-Year Plan*, Map 4, p. 93 and *Gangyao*, p. 61.

<sup>76</sup> The delineation of these regions by province/municipality/autonomous region is as follows: East – Beijing, Tianjin, Shanghai, Hebei, Jiangsu, Zhejiang, Fujian, Guangdong, Shandong and Hainan; Northeast – Liaoning, Jilin and Heilongjiang; Central – Shanxi, Anhui, Jiangxi, Henan, Hubei and Hunan; West – Inner Mongolia, Shaanxi, Gansu, Qinghai, Ningxia, Xinjiang, Chongqing, Sichuan, Guangxi, Guizhou, Yunnan and Tibet. This demarcation derives from the various mega-region policy frameworks, designed to ‘Develop the West’, ‘Revive the Northeast’ and ‘Raise up the Central Regions’, that were launched at different times since 2000.

<sup>77</sup> The ‘new round’ refers to the decision taken at the CCP Central Committee meeting in July 2010 that reaffirmed the commitment to ‘Open up the West’, a policy framework first announced in 1999 and launched in March 2000.

<sup>78</sup> See, for example, ‘Tax discounts in western regions to continue’, *South China Morning Post*, 6 August 2011.



overseas investment. Elsewhere,<sup>79</sup> the Programme also highlights the need to improve 'opening up' policies in three geographical regions – coastal regions (which remain the priority), inland regions and inland border regions – but to adapt related policies to the particular characteristics of each (see Box 2 on page 58 for more detail).<sup>80</sup>

Central to China's regional development policy under the 12FYP is the intention that each region should make the most effective use of its resources endowment and other economic advantages so as to promote growth and development. This is not, however, a new policy departure. Since as long ago as 2005, there has been recognition that the transformation of central China into a transport, commercial and distribution hub has the potential to forge closer linkages between eastern and western regions of the country. The further implication is that individual provinces should, in accordance with their economic and resources endowments, fulfil distinctive roles: for example, Hubei as a centre of car, photoelectron and iron and steel production; Anhui as a labour-intensive manufacturing base; and Henan and Jiangxi as focuses for modern agricultural production.

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<sup>79</sup> CDTD, *Twelfth Five-Year Plan*, Section 12, Ch. 50, pp. 209–10 and *Gangyao*, pp. 130–31.

<sup>80</sup> There are also important references to regional development policy that emerge in other sections of the 12FYP, although the geographical framework in which they are set out is not that of the four 'mega-regions'. In energy plans for 2011–15, various provinces are identified as playing a key role in the development of coal, solar power etc. The western regions of the country are destined to assume a new significance in China's energy security through the construction of oil and gas pipelines across land borders into Xinjiang and Yunnan provinces.

### **Policies for Coastal Regions**

China's coastal provinces have benefited disproportionately from FDI and are the most developed regions of the country. The 12FYP calls on them to deepen their openness to the outside world and to speed up the shift from trade processing towards R&D and cutting-edge manufacturing and service activities, including trade in services. Specific areas in the document include Shenzhen and other special economic zones, Shanghai Pudong and Tianjin Binhai. There is also a commitment to speeding up the process of making Shanghai an international economic, finance, transportation and trade centre.

### **Policies for Inland Regions**

Inland regions should use labour and other resources to promote a pattern of development in accordance with their comparative advantage. The 12FYP seeks to accelerate a process that is already beginning to unfold by proactively encouraging domestic and international companies to establish and/or relocate their activities further inland. It also calls for a number of international trade processing bases and services outsourcing bases to be established in inland regions. There is a specific commitment to maintain the momentum of opening up the 'Liangjiang (Two Rivers) New Zone' in Chongqing, approved in 2010.

### **Policies for Border Regions**

As regions that abut important neighbouring countries in Southeast, South, Central and Northeast Asia, China's land border regions should take advantage of their geopolitical status in order to construct border trade zones and ports and to create cross-border infrastructural linkages. Thus, Heilongjiang, Jilin and Liaoning, as well as eastern Inner Mongolia, will form a 'hub' for links with Northeast Asia; Xinjiang will be an important base for opening up the west; Guangxi will be a new 'high point' for cooperation with ASEAN; and Yunnan will fulfil a similar role as a 'bridgehead' in opening up to the southwest.

*Source: CDTD, Twelfth Five-Year Plan, Ch. 50 ('Improve the Pattern of Regional Opening Up'), pp. 209–10 and Gangyao, pp. 130–31.*

## **5.2 Urbanisation**

As in so many other countries, urbanisation in China has assumed its own indigenous characteristics. One such feature has been the simultaneous emergence of cities of enormous size – note especially the spectacular growth of cities such as Dongguan, Foshan, Zhongshan and Shenzhen in the Pearl River Delta region of Guangdong province – and much smaller but often rapidly

expanding cities. This pattern offers a distinctive and, in some ways, challenging context in which to promote continued urbanisation.<sup>81</sup>

There is a clear expectation that ongoing urbanisation during the 12FYP period will continue to generate the emergence of cities of various sizes with differing roles, depending on the nature of their economic development, their location and their hinterland. The Programme highlights, in particular, the benefits of urban clusters that can serve as nodes from which economic activity can develop, like spokes from the hub of a wheel. There is also the vision of creating major vertical (north–south) and horizontal (east–west) transport arteries that will link the main urban clusters throughout the country.

The 12FYP document leaves no room for doubt that as urbanisation proceeds, it is the cities in the eastern coastal belt that are expected most strongly to strengthen their global competitiveness. They are also the locations in which most of the economic upgrading anticipated under the Programme as a result of rising consumption and the expanding services trade is likely to take place. By contrast, ambitions on behalf of cities in central and western China, their scale depending on local conditions, are more modest. This is an important finding. Plans for a more comprehensive pattern of urbanisation notwithstanding, official reports make it clear that the urban clusters in the Yangtze and Pearl River deltas and Bohai Bay will remain the driving forces of China's future modernisation and continuing integration into the global economy. These three coastal metropolitan areas already account for almost 40 per cent of national GDP. The scale of China's aspirations is revealed in authoritative reports suggesting that this figure will eventually rise to 70 per cent or more.<sup>82</sup>

Nevertheless, in inland China certain growth areas stand out. These include the Chengdu–Chongqing belt, areas around Wuhan, Changsha (the Chang–Zhu–Tan 'city belt') and Xi'an, and the Beibu Gulf (Gulf of Tonkin) on the coast of Guangxi. The Programme also highlights areas that are the focus of poverty alleviation efforts and that pose serious development challenges. Examples include southern Xinjiang, western Yunnan and eastern stretches of the

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<sup>81</sup> For example, there is evidence that firms in small cities have lower levels of labour productivity and are less efficient than their counterparts in large cities, in part because of greater difficulty in achieving lower costs through scale economies. It was estimated a few years ago that 40 per cent of Chinese cities were below their optimal size.

<sup>82</sup> As a case in point, according to the 2009 *City Development Report of China*, the urban share of the total population by 2050 will have reached 75 per cent. *China Daily*, 12 May 2010.

Qinghai–Tibet Plateau. Reference to the need to extend strong support for the development of Tibet and Xinjiang is made without further comment, although both regions are the focus of separate recent policy framework initiatives introduced in the wake of disturbances in 2008 and 2009.

The emphasis on urbanisation in the 12FYP opens up potential opportunities for engagement with the EU. As well as commercial opportunities generated by urban expansion and higher incomes, there is scope for intensified policy dialogue on the common challenges of urban living, such as water and air quality, transport infrastructure, environmental protection and the development of cultural industries, all of which are areas in which the EU has substantial expertise.

### 5.3 Implications

Under the impact of faster GDP growth in central and western China, reported by the National Bureau of Statistics at 14.2 per cent and 13.8 per cent respectively in 2010 compared with 12.3 per cent in eastern provinces – this builds on a trend that has already been in evidence for several years<sup>83</sup> – we expect that a further rebalancing of the Chinese economy will take place. For the EU, this will offer new opportunities for commercial, economic and cultural engagement in regions that have previously not enjoyed important interaction with Europe. In particular, it promises to extend quite significantly the markets for European industrial products and consumer goods, especially as more cities throughout China support a sizeable number of middle class and affluent consumer (MAC) households.<sup>84</sup> Further, in contrast to coastal regional markets that are becoming saturated and experiencing increasingly strong competition from Chinese corporates, it will also create opportunities for investment – especially investment targeted at the domestic market – in areas where preferential treatment is still available. Such activities will enjoy active encouragement from China’s Ministry of Commerce (MOFCOM).

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<sup>83</sup> Since 2007, GDP growth has been more rapid in central and western China than in eastern coastal regions. See Tim Summers and Doris Ma, ‘Is China’s growth moving inland?’, Asia Programme Paper, Chatham House, 2009.

<sup>84</sup> The Boston Consulting Group has predicted that the number of MACs could rise from 148 million in 2010 to 415 million by 2020 (cited in Bloomberg, <http://surviveinchina.com/china-middle-class-and-affluent-consumers-may-triple-in-10-years-bloomberg/>) (accessed on 15 August 2011).

A major policy recommendation emerges from this analysis. A number of EU Member States have already expanded their diplomatic presence in China. There is a strong case in favour of the EU and its Member States working with MOFCOM officials to identify new opportunities for engagement in less familiar locations. The EU could also seek to establish mechanisms for sharing such opportunities with relevant EU companies or institutions and look for ways of providing them with practical support in exploring these opportunities.

## **6 Demographic Change, the Labour Supply and Employment**

Demographic change is important because of its impact not only on China's economic development but also on its social and economic stability. At the heart of China's demographic trajectory during the past three decades has been the one-child family policy. Under its impact, fertility rates have fallen sharply and China's population growth has fallen, according to official estimates, to a mere 0.5 per cent per annum. This is only one-third of the average rate of natural increase for low-income countries, and projections unambiguously show that well before 2050 India will have overtaken China to become the most populous country in the world.

The implementation of a one-child policy presaged one of the most spectacular declines in fertility in history. Restrictions on family formation, sometimes of a Draconian nature, are said to have resulted in 300 to 400 million fewer babies being born than would have been the case in the absence of the policy. Between 2000 and 2010, the rate of natural increase averaged a mere 0.57 per cent, and China has now completed its demographic transition.

### **6.1 China's ageing population and the implications for healthcare and pension provision**

Over time, the less benign consequences of the one-child family policy have increasingly made themselves felt. Of these, the most serious is the changing age profile of the population. Since 1982, while the share of the population aged 0–14 has halved (falling from 33.6 to 16.6 per cent), the proportion of the

elderly (65 and above) has doubled, from 4.9 to 8.9 per cent.<sup>85</sup> The numbers behind these figures are formidable. In particular, the number of over-65s has risen from less than 50 million in the early 1980s to almost 120 million in 2010. The most recent national census, conducted in November 2010, showed that there were 178 million people above the age of 60 in China,<sup>86</sup> compared with *total* populations of 140 million in Russia and 130 million in Japan (of whom 13 and 23 per cent respectively were over the age of 65). Projections suggest that by 2050 the number of over-65s will have reached well over 300 million, with the elderly accounting for about one-fifth of the total population.

There is growing recognition of the serious costs of the implementation of the one-child family policy, including among Chinese analysts. From this perspective, it is significant that the text of the 12FYP contains not a single mention of the policy by name. Instead, there is just one short chapter, which speaks, in very general terms, of the need to 'keep the total population within bounds [the 2015 target is set at a maximum of 1.39 billion], improve the quality of the population, optimise the population structure, and promote the long-term balanced development of the population'.<sup>87</sup>

Within this general framework, the Programme prioritises several aspects of population work, including strengthening family planning services, promoting the 'overall' development of women, enhancing the well-being of children and providing more effectively for the needs of the disabled. It also devotes a section to the need to address the implications of an ageing population, although it is disappointingly short on detail. Indeed, given the accelerated pace of ageing in China in the coming years, and the social and economic demands that this is bound to entail, the lack of attention to this central issue is surprising.<sup>88</sup> In each of the next five years, around 8 million people will, on average, reach the age of 60, and by 2015 the number of over-60s will exceed 200 million. The situation is further complicated by the inherent dynamics of the ageing process. As life expectancy continues to increase, the average age of the elderly will rise as more and more people survive into their 80s and beyond.

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<sup>85</sup> The data are from *Zhongguo tongji zhaiyao*, 2011, p. 39. The further inference is that during the same period, the share of those of working age in the total population increased from 61.5 per cent to 74.5 per cent. *Ibid.*

<sup>86</sup> Ma Jiantang (NBS Director), 28 April 2011 ([http://news.xinhuanet.com/english2010/china/2011-04/28/c\\_13849795.htm](http://news.xinhuanet.com/english2010/china/2011-04/28/c_13849795.htm)) (accessed on 5 October 2011).

<sup>87</sup> CDTD, *Twelfth Five-Year Plan*, Ch. 36, p. 160 and *Gangyao*, p. 102.

<sup>88</sup> The lack of attention may reflect disagreement among policymakers. Some of our discussions in China, supported by occasional news reports, suggest that there is a lively debate on these issues.

Since 2000, the cohort of over-80s has risen from 12 million to more than 20 million, and this figure is expected to reach more than 40 million by 2030 and in excess of 100 million by 2050.

The experience of many other countries highlights the immense financial burden of funding the social welfare requirements – above all, soaring health costs – imposed by ageing. In China, where the government's long-term goal is to provide a universally affordable healthcare system, this burden will become increasingly onerous as the demands of ageing become felt.<sup>89</sup> Such demands threaten to be a major drain on resources, especially in a country that is becoming old before it has become rich.

Even if the social welfare insurance contributions of employers and individuals increase, meeting the funding demands of rapid population ageing will inevitably impose severe demands upon the budgets of both central and local governments in China. This is explicitly acknowledged in the 12FYP through the following commitments:<sup>90</sup>

- to increase the number of urban and rural residents enrolled in the basic medical insurance scheme by 60 million;
- to continue to increase the level of financial subsidies (by an unspecified amount) in support of the basic medical insurance and new rural cooperative medical schemes and to raise the level of payment for policy holders covered by the basic medical scheme to 70 per cent;
- on a nationwide basis, to make plans for the implementation of a basic pension fund for all urban employees and to increase the number of urban residents enrolled in the basic pension scheme by 100 million;
- to increase the basic pension fund and to ensure that unemployed urban residents above the age of 60 receive basic pension remuneration; and
- to implement universal coverage under the new rural cooperative pension scheme and to increase the level of the basic pension.

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<sup>89</sup> One source has estimated that by the mid-2020s, the treatment of obesity-related heart disease and diabetes among the Chinese elderly could cost the government up to 9 per cent of GDP. See Somnath Chatterji et al., 'The health of aging populations in China and India', *Health Affairs*, vol. 27, no. 4 (2008), cited in the US Population Reference Bureau, 'Today's research on Aging: Program and Policy Implications', Issue 20, July 2010, available at <http://www.prb.org/pdf10/TodaysResearchAging20.pdf> (accessed on 30 July 2011).

<sup>90</sup> See CDTD, *Twelfth Five-Year Plan*, Table 19, pp. 163–64 and *Gangyao*, pp. 104–05.

Increased dialogue between relevant Chinese and EU parties promises to help facilitate anticipated major advances in the provision of healthcare services in China during the 12FYP period. There may be much potential too for involvement by European companies in this process. For example, the opening up of the healthcare sector will offer opportunities for European pharmaceutical producers, hospital operators and care home providers. However, potential competition from domestic Chinese producers should not be underestimated, especially as increased investment, improved government support and mergers and acquisitions activities help to bring about the consolidation of domestic healthcare provision and its transformation into a more efficient sector. More widely, there is scope for deeper exchanges on related issues, such as pension provision, as China's demographic structure moves closer to that of Europe.

## 6.2 Employment and wages

The challenge of accommodating accelerated population ageing is heightened by its occurrence at precisely the time when China's work force will be contracting. Between 2000 and 2010, the working-age population<sup>91</sup> grew by 1.2 per cent per annum, compared with 3 per cent for the elderly. Projections suggest that the working-age population could peak by the beginning of the next (Thirteenth) FYP period (2016–20). Thereafter, it will decline at an accelerating rate, and by 2050 may have fallen to around 860 million – 14 per cent less than in 2010.

Employment expansion<sup>92</sup> and wage increases are expected to make a key contribution towards enhancing the role of consumption as a driver of economic growth. Central to efforts to generate higher employment is the expansion of small-scale labour-intensive and service activities. The logic of the strategy is clear: tertiary sector activities create about one-third more jobs per

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<sup>91</sup> 'Working age' for the regularly employed means between the ages of 16 and 59 for men and between 16 and 54 for women.

<sup>92</sup> The NBS shows urban unemployment to have been at 4.1 per cent in 2010 (*Zhongguo tongji zhaiyao*, 2011, p. 46). There is, however, a strong consensus that official figures are significant underestimates and that unemployment in Chinese cities is at least twice as high as that figure.



unit of GDP than does manufacturing.<sup>93</sup> Raising the share of services in GDP was one of the few targets left unfulfilled under the 11FYP, and one of the predictive goals set in the 12FYP is that the tertiary sector's share in GDP should increase from 43 to 47 per cent (see above Table 2, p.41).<sup>94</sup> Activities that will carry the burden of job creation are transport and wholesale and retail trade,<sup>95</sup> although hotels, restaurants, leisure and healthcare will also be prominent sources of new employment. As such activities place less pressure on resources and the environment, their expansion will also enhance China's 'green' credentials.

For European and other foreign investors, the potential benefits of an expansion of service sector activities are considerable. As Stephen Roach has, perhaps optimistically, argued, 'For a nation lacking in much of a services culture, deregulation of domestic services and opening up to foreign direct investment and joint ventures seem like the only viable options.'<sup>96</sup>

The 12FYP also calls for significant growth in wages in the coming five years. Fulfilling the vision of establishing a 'harmonious' society requires that those at the lower end of the pay scale should be the main beneficiaries of increases. It is noteworthy that the Programme calls for the minimum wage to be raised by at least 13 per cent per annum during 2011–15, and it stipulates that the minimum wage in any area should be at least 40 per cent of the average local wage of urban employees.<sup>97</sup>

Another 12FYP target is that 40 million agricultural workers should be transferred to the urban sector during the five-year period. Given the wide gap

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<sup>93</sup> See Stephen S. Roach, 'China's 12th Five-Year Plan: Strategy vs. Tactics', Morgan Stanley, April 2011, p.2, available at [http://www.morganstanley.com/im/emailers/inst/pdf/China\\_12th\\_Five\\_Year\\_Plan.pdf](http://www.morganstanley.com/im/emailers/inst/pdf/China_12th_Five_Year_Plan.pdf) (accessed on 1 August 2011).

<sup>94</sup> Even if this target is fulfilled, the tertiary sector's share of total employment will remain modest compared with that of developed countries, where the corresponding figure averages about 65 per cent.

<sup>95</sup> Roach points out that in 2009, wholesale and retail trade accounted for a mere 4 per cent of non-agricultural urban employment, compared with 15 per cent in the US. Raising this figure to 9.5 per cent would generate more than 5.5 million new jobs, or 12 per cent of the 45 million new urban jobs targeted under the 12FYP. 'China's 12th Five-Year Plan: Strategy vs. Tactics', p.3.

<sup>96</sup> *Ibid.*

<sup>97</sup> CDTD, *Twelfth Five-Year Plan*, Table 19, p. 163 and *Gangyao*, p. 104. In the first half of 2011, minimum wages in 18 provinces, regions and cities rose by 13–28 per cent. Janet Zhang, 'China Economic Outlook', GaveKal Dragonomics, August 2011 (available online only to subscribers).

between urban and rural incomes,<sup>98</sup> fulfilment of this target will, *ceteris paribus*, markedly increase the total wage bill. Since the 1980s, rural–urban migration in China has been characterised by the movement of disproportionately large numbers of farm workers from the central and western regions (the poorest parts of the country) to cities in affluent eastern coastal provinces. Comparison of regional urban and rural incomes highlights the heightened effect on the total wage bill of this geographical flow of migrants. In 2009, average per capita rural net income in western and central regions of China was 26 and 7 per cent respectively below the national average; by contrast, average urban per capita disposable income in eastern China was 22 per cent *above* the corresponding national figure. In short, migration from poor rural regions to affluent cities will raise the total wage bill by even more than is indicated by changes in *national* wage levels.

The 12FYP explicitly commits itself to raising farm incomes through a variety of policies. These include enhancement of price protection measures for farm (especially grain) producers; provision of better skills training and information services for farmers; ensuring that farmers receive a ‘reasonable share’ of revenue from the processing and distribution of agricultural products; and even making use of ‘agricultural landscape resources to develop rural service industries such as sightseeing, leisure and tourism’.<sup>99</sup> The Programme also commits the government to continuing direct subsidy payments for grain producers and to extending subsidies in support of farmers’ purchases of seeds and agricultural machinery.

## 7 The 12FYP and Economic Rebalancing: The Role of Consumption

At the heart of the Twelfth Programme is an attempt to rebalance the economy by raising the share of consumption – above all, *household* consumption – in GDP. Many of the factors already alluded to in this paper are designed to help fulfil this goal. Increased social insurance cover, employment expansion and higher wages, increased subsidies and raising the share of services in GDP – all are, in part, designed to facilitate an increase in consumption.

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<sup>98</sup> In 2010, the average urban disposable income was 3.22 times higher than the average rural net income (*Zhongguo tongji zhaiyao*, 2011, p. 104).

<sup>99</sup> CDTD, *Twelfth Five-Year Plan*, Ch. 6, p. 27 and *Gangyao*, p. 19.

## 7.1 China's consumer revolution<sup>100</sup>

Three decades of reform have already had a profound impact on the levels of material consumption in China. As a result, the structure of consumption has changed markedly. Rises in disposable income have enabled consumers to command a more varied shopping basket, characterised by access to more non-basic items, including consumer durables, electronics and brand-name products. In addition, spending on services in deregulated sectors, such as housing, education, health and transport, has also grown quite sharply. These changes have been most evident in cities, although the same broad pattern of change has begun to emerge in more prosperous parts of the countryside. Indeed, as incomes continue to rise, the rural market will become an increasingly important source of consumption demand.

Access by urban households to 'ordinary' household consumer durable white goods (refrigerators, washing machines, colour TV sets etc.) has now become almost universal. The scope for further rises in demand for such items is limited, except for replacement or upgrading. The greater potential for expansion in consumer spending lies in newer, high-end products, for example mobile (cell) phones, computers and cars, all of which have already experienced explosive growth in recent years. In the rural sector, demand for domestic consumer durables, such as colour TV sets, washing machines and refrigerators, is far from reaching the same degree of saturation as in cities. And rural demand for high-end products has barely begun.

Critically, however, the benefits of the consumer revolution have not been distributed in an equal or equitable manner. Interregional, intraregional and sectoral income and consumption gaps have steadily widened, to the extent that with a national Gini coefficient of close to 0.5, China has become one of the most unequal societies in the world (see also above, Section 2.3). One of the core strategic objectives of the 12FYP is to address the reality that alongside the emergence of a sizeable Chinese middle class, there still existed a large legacy of consumption poverty in 2011.

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<sup>100</sup> The material in this sub-section is a shortened version of Robert Ash, 'China's Consumer Revolution: Winners and Losers', prepared for the International Relations and Security Network (ISN), Eidgenössische Technische Hochschule Zürich and published as an ISN Insight, 28 June 2011. The entire text of the original can be found at <http://www.isn.ethz.ch/isn/Current-Affairs/ISN-Insights/Detail?lng=en&id=130359&contextid734=130359&contextid735=128317&tabid=128317&dynrel=4888caa0-b3db-1461-98b9-e20e7b9c13d4,0c54e3b3-1e9c-be1e-2c24-a6a8c7060233>.

China's official poverty line is set at around US\$0.5 per person per day. On this basis, the number of people living in absolute poverty would constitute well under 5 per cent of the total population. On the basis of the more widely used US\$1 per day criterion, the corresponding number would still not exceed 10 per cent. However, it would be wrong to suppose that 90 per cent or more of China's population are sufficiently well off to be able to allocate a significant share of their income to discretionary spending. Indeed, recent analysis suggests that the number of people with sufficient discretionary spending to enable them to participate in China's consumer revolution is around 300 million.<sup>101</sup> This is the group that in recent years has fuelled the consumption boom in white goods, digital consumer products and brand-name goods. Even though it constitutes less than a quarter of the total population, its spending power, by now well in excess of US\$800 billion (c. Euro 610 billion), accounts for at least 45 per cent of all private spending. This is greater than the combined aggregate spending of South Korea and Taiwan, although per capita discretionary spending is less than 30 per cent of that of those countries.

In both aggregate and per capita terms, China's consumption spending lags well behind that of major developed countries, such as the US, Japan and Germany. This gap will persist for the foreseeable future, although the speed with which consumption behaviour is changing in China is highlighted in estimates indicating that the size of China's 'consuming middle class' has more than doubled since 2005.

## 7.2 Consumption in the 12FYP

Increasing domestic consumer spending is one of the major planks of the 12FYP – all the more urgent since the same aspiration was left unfulfilled in the 11FYP. It is a source of serious concern to the leadership that the recent growth of retail spending, although rapid, has failed to keep pace with that of fixed investment. For example, in the 1990s the share of household consumption in

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<sup>101</sup> See Arthur Kroeber, 'Chinese consumers: dream come true', *China Economic Quarterly*, vol. 14, no. 4 (December 2010), pp. 17–23 (available online only to subscribers). See also Boston Consulting Group, 'Selling in China', Special Report, available at <http://www.bcg.com/documents/file14891.pdf> (accessed on 1 August 2011).

GDP remained quite stable, but between 2000 and 2010 it fell by well over 10 percentage points, from 46.4 per cent to 33.8 per cent.<sup>102</sup>

In pursuit of its goal of raising household consumption, the 12FYP calls for 7 per cent annual growth in both urban and rural per capita incomes (see Table 2 above). According to Credit Suisse analysts, such growth, if fulfilled, would facilitate an increase in total retail sales from RMB15.4 trillion (2010) to RMB40.5 trillion (from Euro c. 1.87 trillion to Euro c. 4.9 trillion, on the basis of the 2010 average exchange rate)— a nominal average annual rate of growth of more than 21 per cent (by comparison, the corresponding figure for 2005–10 was 18 per cent per annum).<sup>103</sup>

The intention to increase households' consumption share of GDP is enunciated early on in the Programme document.<sup>104</sup> Thus:

[We] will create a long-term effective mechanism for expanding consumer demand. Expanding [household] consumer demand will be the strategic focus of expanding domestic demand. We will strengthen the purchasing power of residents, raise their consumption expectations, promote upgrading of the structure of consumption, further release the consumption potential of urban and rural residents, and gradually make the overall scale of our country's domestic market one of the largest in the world by actively yet prudently carrying out urbanisation, implementing the strategy of making employment a top priority, deepening reform of the income distribution system, improving the social security system and creating a favourable consumption environment.<sup>105</sup>

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<sup>102</sup> *Zhongguo tongji zhaiyao*, 2011, p. 36. The same source shows aggregate final consumption spending (i.e., household plus government expenditure) to have fallen from 62.3 per cent to 47.4 per cent in the same period.

<sup>103</sup> The Credit Suisse estimates are cited in KPMG Advisory (China) Ltd, 'China's 12th Five-Year Plan: Consumer Markets', at <http://www.kpmg.com/cn/en/IssuesAndInsights/ArticlesPublications/Documents/China-12th-Five-Year-Plan-Consumer-Markets-201104.pdf> (accessed on 1 August 2011). See also *China Daily*, 5 January 2011. The growth rate for 2005–10 is derived from data in *Zhongguo tongji zhaiyao*, 2010, p. 165 and *Zhongguo tongji zhaiyao*, 2011, p. 161.

<sup>104</sup> CDTD, *Twelfth Five-Year Plan*, Ch. 3 ('Principal Targets'), p. 12 and *Gangyao*, p. 8: 'over the next 5 years, the major economic and social development goals are ... [to raise] the ratio of household consumption to GDP ...'.

<sup>105</sup> CDTD, *Twelfth Five-Year Plan*, Ch. 4 ('Policy Orientation'), pp. 17–18 and *Gangyao*, p. 12.

Some of the measures intended to bring about a rise in spending have already been referred to in this paper. For example, anticipated large-scale urban job creation, increases in per capita income and wages and the extension of social welfare insurance cover all promise, directly or indirectly, to facilitate higher household spending. The potential impact of the planned extension of health and pension coverage lies mainly in its ability to enable households to divert some of their savings towards consumption,<sup>106</sup> and measures to boost funding for public education<sup>107</sup> may have a similar effect. The emphasis on increased provision for rural education is noteworthy, and highlights the growing importance of the rural sector in stimulating future increases in consumer demand.

In addition, projected tax adjustments will help to stimulate demand. The 12FYP makes reference to the need to adjust the personal income tax threshold 'during the early part of the 12FYP period',<sup>108</sup> although the document itself contains no indication of by how much the threshold should be raised. But since the publication of the 12FYP, the issue has been debated by the National People's Congress Standing Committee, and from 1 September 2011 the threshold below which income tax is not payable will be increased from the current level of 2,000 yuan per month to 3,500 yuan. Moreover, the minimum tax rate for low-income earners (those in receipt of between 3,500 and 4,500 yuan a month) will be reduced from 5 per cent to 3 per cent.<sup>109</sup> This change in threshold is expected to exempt an additional 60 million people (the equivalent of 19 per cent of the urban work force) from paying tax. It is likely too that value-added tax, currently set at either 13 per cent or 17 per cent, will be overhauled to the benefit of domestic consumers.

This paper has already suggested that the changing age structure of the population is the most important factor shaping demographic change in the

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<sup>106</sup> NBS household survey data show that in 2010 the urban savings rate was 30 per cent while the corresponding figure for rural residents was 26 per cent (*Zhongguo tongji zhaiyao*, 2011, pp. 104–05).

<sup>107</sup> The 12FYP commits the government to providing free 9-year compulsory education, including the provision of free accommodation in boarding schools in rural areas, and to increasing financial support for pre-school education. Measures are also in place to provide free secondary vocational education for rural students as well as for urban students from poor backgrounds and those studying agriculture. CDTD, *Twelfth Five-Year Plan*, Ch. 30 ('Raise the Level of Basic Public Services'), Table 17, pp. 140–42 and *Gangyao*, Box 17, p. 89.

<sup>108</sup> CDTD, *Twelfth Five-Year Plan*, Table 19, p. 164 and *Gangyao*, Box 19, p. 105 (see also p. 94).

<sup>109</sup> See Xinhua News Agency, 30 June 2011 ([http://news.xinhuanet.com/english2010/china/2011-06/30/c\\_13958711.htm](http://news.xinhuanet.com/english2010/china/2011-06/30/c_13958711.htm)) (accessed on 4 August 2011).

next five years. Population ageing will have a definite impact on consumption demand. The potential importance of this is captured in the finding that in 2009, gross demand by China's elderly population was valued at around one trillion yuan, or 8.2 per cent of total household expenditure. It is estimated that this will grow by in excess of 4 per cent per annum in the coming decades to reach 5 trillion yuan by 2050.<sup>110</sup> For the time being, the market for the elderly in China remains relatively unexplored, perhaps because in the short run the spending power of most elderly Chinese will be limited. But as economic growth continues and incomes rise, especially in cities and coastal provinces, the value of the greying market will steadily expand.

Nevertheless, demographic projections leave no room for doubt that, for the time being, the age cohort that will drive consumption is those born since 1980. This younger age group will account for more than half of China's population by the end of the 12FYP period.<sup>111</sup> As long as the momentum of buoyant GDP and personal income growth is maintained, their discretionary spending is expected to rise rapidly, not least fuelled by a sharp increase in the use of consumer credit spending and online shopping.<sup>112</sup>

## 8 The 12FYP: Commercial Opportunities

The economic and commercial relationship between China and the EU is already a close one. China is the EU's second-largest trading partner after the US; the EU has become China's largest trading partner. In 2010, the value of bilateral merchandise trade was €395 billion (almost one-third more than in 2009). The value of Chinese exports to the EU was €281.9 billion (31 per cent above the 2009 level); that of Chinese imports was €113.1 billion (a rise of 38

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<sup>110</sup> 'China takes measures to deal with aging problem', *People's Daily Online*, 11 October 2010, available at <http://english.peopledaily.com.cn/90001/90776/90882/7162523.html> (accessed on 4 August 2011). The experience of more developed, higher-income countries suggests that there are large dividends from targeting older consumers, especially for pharmaceutical producers and health care providers.

<sup>111</sup> Morgan Stanley, 'European Corporates and China's Megatransition', Morgan Stanley Blue Paper, 29 October 2010, available at [http://www.morganstanley.com/views/perspectives/China\\_Files\\_APac.pdf](http://www.morganstanley.com/views/perspectives/China_Files_APac.pdf) (accessed on 1 August 2011).

<sup>112</sup> China's consumer credit spending is projected to rise from a mere 10 per cent of total consumption expenditure in 2010 to 40 per cent in 2020. The resultant increase in purchasing power will be further boosted by higher wages and lower savings. (*Ibid.*, p. 7). A major expansion in online shopping, as broadband access widens, is also expected during the 12FYP period.

percent).<sup>113</sup> The EU is also the largest source of FDI in China, accounting for €5.3 billion in 2009.<sup>114</sup>

The Chinese ambassador to the EU, Song Zhe, has argued strongly that China's Twelfth Five-Year Plan offers European companies huge opportunities, which promise to translate into 'win-win co-operation'.<sup>115</sup> In particular, he highlights the following areas in which the potential for cooperation is likely to be especially strong:

- Expected increases in consumption spending by Chinese households, especially as urbanisation accelerates, will generate opportunities for European exporters (e.g. car and machinery manufacturers) to increase their market share in China.
- The Chinese government's planned increase in spending on social insurance programmes (e.g., pensions and medical care) in a context in which population ageing is accelerating will create new demands (e.g. for pharmaceuticals, care homes etc.), which should elicit a strong response from European companies.
- The intention to raise the share of services in GDP will offer opportunities to European service-providers, such as in finance, insurance and consultancy.
- European hi-tech industries (e.g. telecommunications and aerospace) are likely to benefit from Chinese efforts to upgrade the technological base of the Chinese economy and to expand its hi-tech sector.
- The 12FYP's prioritisation of clean energy and 'green' growth will offer opportunities for European companies, especially in the provision of low-carbon technologies, in which Europe is a world leader.

This is an impressive list, although Song's rehearsal of the benefits seeks, for obvious reasons, to put the best possible interpretation on the potential gains

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<sup>113</sup> Data from the EC. See <http://ec.europa.eu/trade/creating-opportunities/bilateral-relations/countries/china/> (accessed on 26 July 2011).

<sup>114</sup> *Idem.*

<sup>115</sup> See Song Zhe, 'China's five-year plan is an opportunity for Europe', the full text of which can be found at <http://www.europeanvoice.com/article/imported/china-s-five-year-plan-is-an-opportunity-for-europe/70821.aspx> (accessed on 26 July 2011).



for Europe arising from the 12FYP.<sup>116</sup> That the 12FYP offers European companies new opportunities is beyond doubt, especially as China seeks to meet ambitious new targets in energy, environmental protection, technological transformation etc. Fulfilment of these targets is beyond the capacity of China's domestic resources and capabilities, and trade and investment (FDI and OFDI) will be important means of securing technological and other kinds of assistance. There seems little doubt that China is set to become the largest market for environmental products in the world. Its attempt to shift towards low-carbon growth and advanced, clean technologies promises to elicit an especially strong response from within the EU.

In the remainder of this section of the paper, we examine the trade and investment opportunities and challenges for European business arising from the 12FYP.<sup>117</sup> In line with our belief that changes in the Programme are likely to be more evolutionary than radical, many of the areas to which we draw attention here are likely to already have caught the attention of the European business sector. The commercial implications of the 12FYP are linked to the policy environment for trade and investment, but the extent of these linkages varies across sectors and is dependent on the scale of business. For example, China's investment policy has real relevance for major European investors in financial services but less for small and medium-scale enterprises (SMEs) seeking to sell consumer goods in the Chinese domestic market in sectors where the general level of regulation is more limited.

In the following sections, we analyse the commercial implications from structural, geographical and sectoral perspectives. *Structural* changes take as their starting point Chinese trade and investment policies, and we also examine the implications of China's emergence as an increasingly powerful player in the global economy. *Geographical* changes refer to the impact of shifts in China's economic geography (outlined in Section 5 of this paper). The *sectoral* analysis identifies changing commercial opportunities and challenges in some of the major business sectors.

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<sup>116</sup> In a speech to the Delegation for Relations with China, Song Zhe emphasised the need for China and the EU to 'make the best out of our comparative advantages by thoughtfully matching Europe's expertise and China's market, and facilitate business growth'. See <http://www.chinamission.be/eng/jd/t807412.htm>.

<sup>117</sup> There are also opportunities from the prospect of growing Chinese ODI. This issue is dealt with briefly below, and is the subject of a separate ECRAN publication.

Issues facing companies based in Hong Kong and Macao are similar to those that confront other foreign businesses, although the special status of those two special administrative regions (SARs), and the closer economic partnership arrangements they have established with Beijing since 2003, have given both regions' commercial relations with the Mainland their own special characteristics. The content of the 12FYP as it relates to Hong Kong and Macao is relevant to European companies seeking to explore business opportunities in China. This is especially so in view of Hong Kong's role as a financial centre and as a base from which SMEs can access the Mainland and benefit from Hong Kong's simpler regulatory framework. (For reasons of space, we have chosen not to include further discussion of Hong Kong and Macao in the main body of the text, but we provide a brief comment in Annex C.)

### 8.1 Structural shifts and the policy environment

Structural changes refer to those changes that reflect interaction between an evolving policy environment and China's increasing weight and commercial leverage in the global, and thus European, business community. Put simply, China's growing size and economic clout means that the rules of the commercial game are changing. In particular, shifts are taking place as follows:

- from a situation in which China is primarily viewed as an export base to one in which its domestic market looms much larger, albeit in a context in which it remains an integral part of global supply chains,<sup>118</sup> and
- from a situation in which China's status as a developing country has dictated a reactive response to policy and commercial developments in OECD economies to one in which it is playing a more proactive role in driving global economic policy and economic growth (see also Section 4).

The content of the 12FYP as it relates to trade and investment speaks to these themes.<sup>119</sup> It describes China's approach to foreign trade and investment (both inward and outward) and sets out the government's views on global economic governance and regional cooperation. Its main thrust is captured in its even

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<sup>118</sup> The high premium placed on consumption in the 12FYP alongside China's continuing economic growth means that servicing the domestic Chinese market will become an ever more important part of foreign businesses' investments and exports into China.

<sup>119</sup> See especially Section 12 of the 12FYP (chs 50–53), 'Create a Win-Win Situation: Raise the Levels of Opening Up'. CDTD, *Twelfth Five-Year Plan*, pp. 209–16 and *Gangyao*, pp. 130–35.

stronger advocacy of openness,<sup>120</sup> motivated by its role in helping to promote development, reform and innovation within China, and its criticism of protectionism.<sup>121</sup>

The 12FYP seeks to promote a 'new trend' that will enable China to shift from its previous principal status as a source of exports and FDI inflows to one in which inward FDI and outward OFDI more closely complement each other and in which exports and imports are more closely in balance. This, in turn, implies changes in the nature and structure of exports, alongside more rapid import growth. Most significant of all, although the Programme is short on details, is the strong encouragement given to creating a policy environment that favours increases in China's outward FDI.<sup>122</sup>

The discussion of ODI, 'going global' (*zouchuqu*), is of a very general nature.<sup>123</sup> It addresses not only ODI but also contracted and 'labour cooperation' projects. The Programme talks as well about the gradual emergence of Chinese transnational corporations<sup>124</sup> and about the need to 'protect China's interests overseas and take a preventative approach to risk'. In undertaking ODI, Chinese firms are motivated by various goals, including accessing technology and raw materials and/or natural resources, exploring new markets and seeking higher profit margins overseas in the face of increasing capacity at home.

Historically, China's ODI has been limited: by the end of 2010, China was ranked 17th in terms of total stocks of outward investment.<sup>125</sup> But trends over recent

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<sup>120</sup> The policy implications of 'openness' are not confined to foreign trade and investment, and the focus of this section is deliberately formulated in the phrase 'openness to the outside world / foreign countries' (*duiwai kaifang*).

<sup>121</sup> For some time, Chinese sources have expressed disquiet about alleged European 'protectionism'. See, for example, Shixue Jiang, Chinese Academy of Social Sciences, 'The future of Sino-European economic relations in Chinese perspectives', a paper presented at a conference on 'The Future of Sino-European Economic and Financial Relations', Hong Kong Baptist University, 3–4 June 2010.

<sup>122</sup> In 2009, China's outward FDI totalled US\$56.29 billion (Euro c. 40.5 billion), compared with US\$90.03 billion (Euro c. 64.7 billion) of inward FDI. At the end of 2009, the stock of outward FDI totalled US\$245.76 billion (Euro c. 165 billion), of which Europe accounted for a mere 3.5 per cent (US\$8.68 billion, or Euro c. 5.9 billion). NBS, *Zhongguo tongji nianjian*, 2010, p. 257.

<sup>123</sup> See CDTD, *Twelfth Five-Year Plan*, Ch. 52 ('Integrate "Bringing In" with "Going Global"'), p. 214 and *Gangyao*, p. 134.

<sup>124</sup> 'Transnational corporation' is a more literal translation of the Chinese phrase *kuaguo gongsi* than 'multi-national corporation'.

<sup>125</sup> UNCTAD data show that China's total cumulative stock of ODI in 1990–2010 was a tiny 1.5 per cent of the equivalent figure for all developed countries (US\$298 billion, compared with US\$20,408 billion). UNCTAD, *World Investment Report 2011: Non-Equity Modes of International Production and Development*, available at <http://www.unctad-docs.org/files/UNCTAD-WIR2011-Full-en.pdf>.

years show that its relative importance as a global investor is rising. China's 2010 flows of outward investment, at US\$68,800 million (Euro c. 51,300 million), ranked fifth globally and were 27.1 per cent higher than in 2009. With ODI growing faster than FDI into China, the 12FYP policy goal of bringing the two into balance looks realistic.

China's future export policy will focus on maintaining existing competitive strengths while nurturing new ('core competitive') strengths in technology, branding, quality and services. Specific goals include raising the quality and value-added of labour-intensive exports, expanding exports of electronics and high-technology products and 'strictly controlling' exports of energy and resource-intensive and polluting products. Export processing will be highly concentrated in special customs zones. Chinese enterprises are also encouraged to establish overseas sales networks and more actively to explore overseas markets.

On imports, there is specific reference to the proactive expansion of several categories of import:

- technology, parts and components – items that are key to fulfilling China's aspirations to upgrade its economy;
- resources that are in scarce supply in China;
- resource-saving and environmentally efficient products; and
- products that will help to expand domestic consumption, rebalance the economy and/or improve the trade balance.

This menu creates opportunities for EU exporters in a number of areas, but especially in consumer products (including, but not limited to, luxury goods) and 'green' exports.

Another area of particular relevance to the EU is the 12FYP's intention to develop trade in services so as to help upgrade the economy and increase the service sector's share of GDP. Exports are to be expanded from traditional sectors – tourism and transport – to new products, such as culture, Chinese medicine, software and communications services, business services, finance and insurance. Efforts will also be made to attract service outsourcing and to 'open up' education, health and sports.

However, the stated plan to diversify foreign trade and to increase exports to emerging markets is likely to be less favourable to the EU, although this is

understandable in the wake of the recent global crisis. In fact, the diversification of China's foreign economic relations has already been under way for some years. For example, between 2000 and 2010, Europe's share of FDI inflows to China almost halved, from 9.6 per cent to 5.3 per cent, indicating that from a Chinese perspective, the relative importance of European investment is declining.

Predictably, the future policy emphasis in terms of FDI inflows will be to attract investment of the kind that will enable China to fulfil the goal of developing a more efficient and innovative economy. Thus, the 12FYP highlights the need to increase FDI in high technology, cutting-edge manufacturing industries, resource-efficient and environmentally friendly sectors and also modern services. An important supplementary objective is to attract human resources and foreign R&D centres to China in order to support such developments.

A reference to resisting 'protectionism' touches on politically sensitive issues not spelled out in the 12FYP but expressed in European companies' concern about the difficulties of market access and the Chinese government's disquiet in the face of the EU's continued unwillingness to designate China a 'market economy'. It is unlikely that the 12FYP itself will markedly affect the extent to which trade tension is (or is not) reduced in the coming five years. However, the Programme's commitment to oppose protectionism could be used by the EU as a political tool in support of efforts to increase market access.

The 12FYP offers real opportunities for EU companies, but the numerous challenges that they also face should not be underestimated. A recent analysis of investment opportunities for European SMEs seeking to take advantage of the greening agenda in the 12FYP<sup>126</sup> is at pains to highlight a number of 'significant challenges' that such companies are likely to encounter. They include:

- increased competition from domestic enterprises in China, which are likely to benefit from advantages – for example, access to capital and subsidies – not available to would-be European investors;
- procurement policies that favour domestic Chinese firms;<sup>127</sup>

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<sup>126</sup> Tan Copey and Isabel Hilton, 'Greening China: Outlook for European SMEs', Spring 2011, available at [http://www.friendsofeurope.org/Portals/13/Documents/Reports/UC\\_Policy-Briefing\\_Greening-China\\_web.pdf](http://www.friendsofeurope.org/Portals/13/Documents/Reports/UC_Policy-Briefing_Greening-China_web.pdf) (accessed on 24 July 2011).

<sup>127</sup> Copey and Hilton note that 'a "buy Chinese" attitude still shapes procurement policy'. Ibid.

- encroachment on profit margins associated with higher costs in China (via wage increases, higher prices for raw materials, higher value-added tax and the introduction of new environmental taxes); and
- difficulties in enforcing the protection of intellectual property rights (see also 10.2.3).

The last point is especially important given the 12FYP's explicit commitment to technological upgrading, and may make this policy driver more difficult to turn into commercial success for EU companies.

## 8.2 Geographical changes

The context of the 12FYP's expectation of the continued evolution of China's economic geography (see Section 5) is that since 2007, GDP growth in central, western and northeastern regions of China has been faster than in the more affluent and highly developed eastern coastal provinces. In 2010, for example, official data showed that western China's aggregate GDP growth was 14.2 per cent, that of the central regions 13.8 per cent, the northeast 13.6 per cent and the eastern coastal provinces 12.3 per cent.<sup>128</sup> Continued urbanisation and the development of transport infrastructure, especially high-speed rail and road networks, will also affect the regional disposition of economic activity.

These anticipated developments point to increasing commercial opportunities in inland China and in cities that previously offered few or no such opportunities. At the same time, the *relative* importance of the three major coastal clusters (around Beijing, Shanghai and Guangdong/Hong Kong), which have dominated most foreign business activity in China since the 1980s, will diminish – even though they will remain substantial drivers of the national economy. In formulating their business strategies in China, EU companies must anticipate these changes in economic geography. The precise implications of such changes will vary, depending on the sector, the business model and the extent to which a particular company's business activity is integrated into global or regional supply chains or, alternatively, is aimed at domestic markets.

Companies sourcing from China or engaged in export-orientated investment there will need to compare the cost savings from moving or expanding their facilities inland with the extra time and cost entailed in getting their output to

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<sup>128</sup> See also Summers and Ma, 'Is China's growth moving inland?'

ports. It is not yet clear that these calculations favour shifting (or expanding) inland, except perhaps in higher value-added sectors, such as consumer electronics, where Chongqing and Chengdu already seem to be attracting a critical mass of manufacturers. These developments need to be watched carefully in the next few years, especially as cargo carriers are starting to fly from inland Chinese airports to Europe and elsewhere and a rail connection is gradually becoming available from Chongqing through Xinjiang and Central Asia to Europe.

For businesses seeking to access the domestic market, however, the calculations may be different. Here the key issue is that of location, where the domestic markets are located. One way of approaching this is in terms of the urban clusters highlighted in Map 4 of the 12FYP. Viewed from this perspective, not only is the size of the China market increasing but it is also becoming geographically more widely spread. Reinforced by the growing affluence of individuals and the increasing wealth of businesses, this creates new opportunities. In addition, it poses new challenges in managing businesses spread over a large area that has numerous urban centres.<sup>129</sup>

As for FDI (whatever the motivation for it), the Chinese central authorities are actively encouraging its shift inland, and this generally elicits a positive response from local governments. Nevertheless, the precise response depends on the impulses and priorities of local governments, and therefore the ease with which the investment goals of foreign companies are fulfilled may vary according to location. (See 8.4 for some policy implications for the EU of the geographical shifts considered in this section.)

### 8.3 Sectoral analysis

The commercial implications of expected changes during the 12FYP period will vary across different sectors, in accordance with three factors:

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<sup>129</sup> China's logistics and retail distribution systems are complex, fragmentary and very inefficient. Supply chains are characterised by the movement of goods by road (about two-thirds of retail distribution is by road) over long distances (about a quarter of deliveries involve journeys of more than 500 km.), with goods often loaded and unloaded several times. See Tom Miller, 'Distribution logistics: tangled supply chains', *China Economic Quarterly*, vol. 14, no. 4 (December 2010), pp. 40–44.

- the sectoral impact of the 12FYP’s ‘development model’ or of other policy changes (for example, those related to indigenous innovation or intellectual property);
- the likely extent of adjustments to existing sectoral policy frameworks, including in areas such as market access (access to a given sector encouraged, restricted or prohibited?); and
- geographical features, such as industrial agglomeration, or structural links to the global economy.

On the basis of this paper’s analysis of the 12FYP, we have identified five policy drivers, each of which has its own sectoral implications for various economic sectors: industrial and urban development, innovation, energy efficiency and the environment, domestic consumption, and improved livelihoods and welfare. Their impact on various sectors of the Chinese economy is summarised in Table 3.<sup>130</sup>

Table 3: Overview of sectoral implications of the 12FYP

Policy driver (12FYP)	Sectoral targets and economic implications
<b>Industrial and urban development</b>	<ul style="list-style-type: none"> <li>• Urbanisation, city planning, urban transport</li> <li>• Infrastructure development (including water treatment)</li> <li>• Transport and logistics</li> <li>• Agriculture: irrigation, food safety</li> </ul>
<b>Innovation</b>	<ul style="list-style-type: none"> <li>• Technology that enhances the competitiveness of Chinese industry</li> <li>• Education, training and human resource development</li> <li>• Research and development</li> </ul>
<b>Energy efficiency and the environment</b>	<ul style="list-style-type: none"> <li>• The seven ‘strategic emerging industries’: new-generation IT, energy efficient/environmentally friendly, alternative-energy, biotech, high-end manufacturing, new materials and alternative-energy automobiles</li> <li>• Energy-saving and environmentally friendly businesses, including low-carbon technologies or models, and more efficient use of traditional forms of energy</li> <li>• Pollution reduction (nitrates, sulphates etc.)</li> <li>• Negative impact on inefficient and environmentally degrading industries</li> </ul>

<sup>130</sup> Our thinking here has been helped by an analysis conducted by McKinsey, which maps the implications for various sectors of the economy on the basis of the implications both for ‘impact on growth of profit pool’ and for ‘market access’. McKinsey’s work looks at the impact of four sets of factors, which were grouped under domestic consumption, transformation of industry, green development and social harmony. ‘What China’s 12th Five-Year Plan means for business’, July 2011, [https://www.mckinseyquarterly.com/Economic\\_Studies/Productivity\\_Performance/What\\_Chinas\\_five-year\\_plan\\_means\\_for\\_business\\_2832](https://www.mckinseyquarterly.com/Economic_Studies/Productivity_Performance/What_Chinas_five-year_plan_means_for_business_2832), last accessed on 15 August 2011, available on registration via [www.mckinseyquarterly.com](http://www.mckinseyquarterly.com).



<b>Domestic consumption</b>	<ul style="list-style-type: none"> <li>• Service industries: finance, modern logistics, hi-tech and business services</li> <li>• Tourism, sports, education and human resources</li> <li>• Retail and consumer goods</li> <li>• Cultural industries</li> </ul>
<b>Livelihoods and welfare</b>	<ul style="list-style-type: none"> <li>• Public services, especially healthcare-related industries</li> <li>• Public housing</li> <li>• Pension and welfare management</li> <li>• Rural livelihoods, including financial services</li> </ul>

The table suggests the areas of the economy most likely to be affected by the 12FYP,<sup>131</sup> but not all of them are equally accessible to European investors, whether because they do not reflect the specific strengths of European businesses or because the relevant sector is not open to foreign business involvement. The Chinese government indicates the extent of its willingness to accept such involvement by placing sectors in one of four categories in order to show whether foreign investment is 'permitted', 'encouraged', 'restricted' or 'prohibited'. This categorisation has been revised at times in the past and will continue to evolve. Thus, the policy frameworks set out in the 12FYP make clear that foreign business activities are likely to be less encouraged than in the past in industries that use high amounts of energy or are polluting and also in low value-added manufacturing in coastal regions, especially if such activities are environmentally damaging.

With this in mind, we have chosen the sectors highlighted below both because of their central position in the 12FYP (as suggested in Table 3) and because of the level of engagement and market access<sup>132</sup> they offer to European companies.

### 8.3.1 Energy and environment

This is a promising area for foreign engagement. Fulfilling China's ambitious energy, environmental protection and technological transformation targets is beyond the capacity of China's domestic resources and capabilities, and trade and investment will be important means of securing technological and other kinds of assistance. China is likely to become the world's largest market for environmental products. Its attempt to shift towards low-carbon growth and advanced, clean technologies should elicit an especially strong response from

<sup>131</sup> Much will of course depend on the extent to which the Programme is implemented between now and 2015. See 3.3 on the challenges of implementation at this stage.

<sup>132</sup> By 'market access' we refer to the ease with which European (or foreign) companies are able to do business in China. This is different from the definition of 'market access' as 'the intensity of regulation' used by the McKinsey analysis cited above.

within the EU, where relevant expertise is among the most advanced in the world. The choice of ‘strategic emerging industries’ in the 12FYP also reflects the premium placed on making more efficient and ‘greener’ use of limited resources. (For detailed consideration of energy-related issues, see 10.1.)

### **8.3.2 Domestic consumption**

The market for European consumer products, especially towards the higher end, has already grown impressively in recent years, and the 12FYP’s emphasis on increasing domestic consumption will expand market opportunities across the service industries and the consumer goods, cultural and education sectors.<sup>133</sup> These are also sectors with relatively good market access, although potential foreign producers will need to keep a watching brief on whether predictions of higher taxes on luxury goods to facilitate more equal income distribution prove to be correct.

### **8.3.3 Urban development and livelihoods**

This area has largely been ignored in many commentaries on the 12FYP, which have emphasised the newer industries. But Europe’s experience in urban planning and design, water treatment, air quality improvements and urban transport offer real commercial opportunities, especially in sustainable and environmentally friendly planning.

### **8.3.4 Service sectors**

Exports should be expanded from traditional sectors (tourism, transport and labour) to culture, Chinese medicine, software and communications services, business services, finance and insurance. Efforts should also be made to attract services outsourcing and to open up areas such as education, health (see 6.1) and sports.

### **8.3.5 Strategic sectors: limited opportunities**

Opportunities in sectors that the Chinese government categorises as ‘strategic’ are likely to remain challenging for EU companies. We do not expect China to make new commitments to opening such sectors above and beyond what was agreed as part of the WTO accession package.

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<sup>133</sup> The McKinsey report cited above lists consumer electronics, tourism, medical devices, insurance, logistics, IT, pharmaceuticals, culture, food and consumables, retail, construction, airlines and shipping. Not all these offer equal opportunities for European companies: thus the insurance sector is likely to remain dominated by domestic companies.

As a case in point, opportunities in the financial sector are likely to be mixed. As Banco Bilbao Vizcaya Argentaria has observed, Chinese banks are likely to become increasingly competitive, even as slow interest rate liberalisation eats into comfortable profit margins. Meanwhile, foreign banks have less than 2 per cent market share by assets, and this has been declining.<sup>134</sup> Similarly, foreign insurers have not broken into the market to the extent that was hoped for prior to China's WTO accession. The most likely models for banks and insurers will be those involving tie-ups with, or equity stakes in, Chinese counterparts. However, there may be some new opportunities in alternative finance, including at the provincial level. The 12FYP contains references to encouraging private equity and venture capital, and these are areas in which foreign players still have substantial competitive advantages over their Chinese counterparts.

## 8.4 EU trade and investment policy towards China

The previous analysis leads us to make the following suggestions in regard to future EU trade and investment policy towards China:

- Through high-level dialogue, the EU should continue to press the Chinese government on issues of concern to European companies. In doing so, it is essential that the EU should keep in mind the need for reciprocity, especially as China's role in the global economy becomes ever more important.
- The EU should sponsor research and analysis of the new opportunities and challenges for businesses in sectors that are particularly important for the EU economy.
- The EU should also provide other forms of practical advice, to support the activities of EU companies in China. Such services should complement the varied offerings of Member States. The EU SME Centre in Beijing appears to be a useful model for the provision of such support.
- The expected regional reorientation of the Chinese economy is one of the hallmarks of the 12FYP. If and as this takes place, there is a strong case on economic grounds for extending the EU presence to areas of China that offer new commercial opportunities so as to offer support to companies

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<sup>134</sup> 'Banking Watch: Assessing the financial sector implications of China's new Five-Year Development Plan', BBVA research, Hong Kong, 18 May 2011.

seeking to establish themselves in those areas. The EU Chamber of Commerce has a good regional footprint in China; but apart from Chengdu, the nine cities in which it has representative offices are in coastal provinces.

## 9 Education

### 9.1 Headline content

Major educational objectives under the 12FYP are highlighted under four main headings:<sup>135</sup>

- comprehensive development of education at all levels;
- promotion of 'equality' in education;
- promotion of 'well-rounded' education, including physical and moral education; and
- intensified reform of the educational system.

Stated targets include raising gross enrolment in pre-school and secondary school education to 85 and 87 per cent respectively and increasing government spending on education to 4 per cent of GDP by 2012. Efforts will also be made to make nine-year compulsory education universal and to strengthen vocational education, especially in order to meet the needs of agriculture.

The 12FYP also commits itself to improving the quality of higher education<sup>136</sup> and to increasing the pace of development of 'world-class' and 'high-quality' universities, namely Chinese universities capable of competing on the highest level with those outside China. In promoting the university sector, the Programme emphasises 'key disciplines', notably those in S&T.

Elsewhere in the Programme, reference is also made to the priority need for universities to produce specialists in order to overcome 'critical shortages' of personnel in crucial areas such as biotechnology, new materials, aeronautics and astronautics, international business, energy and resources, equipment manufacturing and agricultural science and technology. Other designated

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<sup>135</sup> See CDTD, *Twelfth Five-Year Plan*, Ch. 28 ('Accelerate Educational Reform and Development'), pp. 128–32 and *Gangyao*, pp. 82–85.

<sup>136</sup> In 2009, China had 2,305 universities, of which 1,090 were universities offering full undergraduate courses. The remaining 1,215 were described as 'colleges with specialised courses'. *Zhongguo tongji nianjian*, 2010, p. 759.

priority disciplinary focuses include education, culture, law, pharmacology, health and social work.<sup>137</sup>

## 9.2 Contextualisation and interpretation

Between the 1950s and the late 1970s, literacy rates rose significantly, as did enrolment in lower levels of education; by contrast, enrolment in higher levels of education was more neglected.<sup>138</sup> Under the impact of post-1978 reform, further impressive progress has been made. The literacy rate has reached around 85 per cent while the proportion of children attending schools, including senior middle school, has risen dramatically,<sup>139</sup> putting China well ahead of India. There has also been a remarkable renaissance among Chinese universities: the number and quality of staff and students have risen appreciably, methods of instruction have improved and the range of courses on offer has widened.

In addition, increasing numbers of students have participated in overseas undergraduate and, especially, postgraduate training. Between 1978 and 2010, the number of students enrolled in overseas postgraduate courses increased from 10,934 to 1.54 million, new enrolments rising from 10,708 to more than 538,000.<sup>140</sup> Australia, Canada, the United States and west European countries have been the most popular destinations.

## 9.3 China's educational policies: risks and challenges

Young Chinese regard high-quality education as one of the most important prizes available to them, benefiting them and also their children. If, however, educational opportunities are perceived to be unequally distributed or if they fail to meet rising demand, grievances could grow. The 12FYP implicitly

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<sup>137</sup> CDTD, *Twelfth Five-Year Plan*, Ch.29 ('Cultivate a Large Contingent of High-Quality Personnel'), p. 134 and *Gangyao*, pp. 86–87.

<sup>138</sup> For example, by 1978, 88 per cent of student graduates of primary schools enrolled in junior middle schools, but only 41 per cent of junior middle school graduates entered senior higher middle schools. See Chris Bramall, *Sources of Chinese Economic Growth, 1978–1996* (Oxford: Oxford University Press, 2000), p. 159.

<sup>139</sup> Between 1978 and 2009, the number of children completing senior middle school education rose by almost 21 per cent while the corresponding figure for junior middle school graduates was 6 per cent. *Zhongguo tongji nianjian*, 2010, p. 757.

<sup>140</sup> *Zhongguo tongji zhaiyao*, 2011, p. 167.

recognises this danger in the importance it attaches to extending educational opportunities, especially in rural areas.<sup>141</sup>

Trends in higher education pose their own challenges. There is increasing excess demand for university places among young people, and it will become more and more difficult to accommodate students in the university of their choice, jeopardising China's commitment to quality assurance in higher education. The outcome is likely to be increasing disaffection among potential students and their parents.

If they can afford it, some students will go abroad. But whereas a decade ago a foreign university degree was something to which only the brightest students could aspire, there is now a widespread feeling that only those who lack the qualifications to be admitted to a top Chinese university seek to study overseas. The irresponsible attitude of some foreign universities, which have admitted large cohorts of Chinese students without sufficient regard for their quality, has helped to reinforce this perception. This issue could disrupt relations between European and Chinese universities. Nor can it be said that one alternative adopted by several European universities, that of setting up a branch campus in China, is the answer. In practice, some universities have experienced difficulties.

## 9.4 Implications for the EU

Education features prominently in *EU 2020*, where it is seen as key to fulfilling the EU's economic and social goals. The EU and China share a number of concerns in formulating an educational policy that seeks to facilitate the establishment of an 'innovative country' (China 12FYP) or an 'innovation union' (*EU 2020*). The goals of inclusivity, improved quality, the creation of a skills base in science and technology and the enhancement of entrepreneurship are all elements that the two sides have in common. On the basis of initiatives that are already under way, there is much scope for dialogue and exchanges on governance issues in education.

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<sup>141</sup> The spread of education also carries a political risk. The more highly educated people become, the more they may come to question the CCP's judgement on policy issues and the more confident they may feel in exposing corruption and incompetence. The combination of such perceived educational 'entitlements' and improved means of communicating information, including opinions, has the potential to threaten the political status quo.

It is possible that in view of improved higher education provision in China, and some change in attitude towards overseas university education, the influx of undergraduate students coming to universities in EU Member States from China may have peaked. Given the success with which Chinese universities have modernised their teaching programmes, despite the existence of quite successful joint degree programmes between Chinese and European universities, this was probably to be expected.<sup>142</sup>

For postgraduate study, however, the future looks bright, and there is great scope for recruitment of Chinese postgraduate students by EU Member State universities – above all, in all areas of S&T, business studies, international relations and in niche areas such as environmental studies. But although there is strong interest among Chinese students in applying to EU universities' Master's and PhD programmes, it has been much more difficult to persuade European students to study in China. Language and cultural issues, a lack of familiarity with China's university system and the attitudes of potential European employers to the value of Chinese postgraduate university degrees have all played a part in this. The EU should, as a matter of urgency, address these issues, perhaps in cooperation with the relevant Chinese authorities.

As we shall show in the next section of this paper, there is now a quite substantial history of research exchange and collaboration between individuals and institutions in China and the EU. On the European side, such cooperation has been funded by the EU Framework Programme and its Marie Curie Fellowship Scheme, as well as by EU Member States; and in recent years, China's Natural Science Foundation and other bodies have also contributed to funding.<sup>143</sup>

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<sup>142</sup> In 2002, the British Council, whose remit includes assisting British universities in undergraduate recruitment in China, predicted that within a few years the upward trend in enrolments from China would be reversed. Seminar on recruitment from China, British Council, London, 2002. The joint degree programmes referred to in the text are subject to strict control by the Chinese Ministry of Education. The EU's Erasmus Mundus Programme is another mechanism that has enabled Chinese students to attend European universities.

<sup>143</sup> The issue of EU-China mobility has been addressed most recently through the establishment in 2010 of the Science and Technology Fellowship Scheme, an EU project operating outside of the Framework Programme that is intended to increase European scientists' familiarity with China through the provision of six months of language and culture training in Beijing followed by 18 months of research in a Chinese university. See also Section 10 of this paper.

# 10 Science, Technology and Innovation

## 10.1 Headline content

The 12FYP's broad goal is to upgrade China's capabilities in indigenous research and innovation in S&T and to speed up the construction of an 'innovative country'.<sup>144</sup> To this end, China's investment in R&D is intended to increase from 1.8 per cent to 2.2 per cent of GDP between 2010 and 2015.

The headline content for science, technology and innovation (STI) in the 12FYP is primarily in its Chapter 27. But reference should also be made to China's 'Medium to Long-Term Plan for Science and Technology', published in 2006, which runs from 2006 to 2020. This document sets out the full intention for S&T for a 15-year period, encompassing the shorter time frame of the 12FYP. It is consistent with the newer Programme and complementary to it.

In support of its commitment to construct an 'innovative country' and create a more innovation-driven economy, the Programme draws particular attention to the need to upgrade the innovation capabilities of enterprises. Central to its approach is a commitment to encourage 'leapfrog advances in key areas', affirming the state's determination to continue to play a leading role in guiding and shaping the evolution of the innovative economy.

Chapter 27 contains separate sections on the following topics:

- *Promoting major breakthroughs in science and technology:* The document reaffirms the dual commitment to basic research and 'frontier technology' and calls for 'top-ranking achievements', especially in the physical sciences, life sciences, space science, earth sciences and nanoscience and technology. The need to link advancements in science and technology with the upgrading of industry is explicitly stated.
- *Speeding up the establishment of a technological innovation system, with the enterprises as the key players:* Various strategies are proposed for meeting the goal of achieving 'an enterprise-centred, market-oriented and industry-education-research integrated technology innovation system' with enterprises as the main players in R&D input. Those strategies include enhancing the S&T support provided by government to enterprises; encouraging large-scale enterprises to invest in R&D; increasing the motivation of research institutes and universities to carry

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<sup>144</sup> CDTD, *Twelfth Five-Year Plan*, Ch. 2 ('Guiding Principles'), p. 10 and *Gangyao*, p. 7.



out innovation; and setting up strategic innovation alliances among enterprises, research institutes and universities. A programme will also be instituted specifically to assist SMEs with innovation.

- *Strengthening the construction of science and technology infrastructure:* The Chinese government seeks to reinforce and develop its existing S&T infrastructure, with a view to enhancing capacities for innovation. The intention is to build on existing platforms for basic, 'frontier' and generic research in science and technology, to support the creation of technology-service platforms directed at enterprises and to establish technology centres within enterprises. The government has committed itself to building new national science centres and State Key Laboratories in core disciplines and strategic high-tech fields and also national engineering laboratories in key areas of industrial technology. Such developments should complement one another, and the principles of open access and sharing, and efficient utilisation, will be observed.
- *Strengthening policies to support science and technology innovation:* Here the emphasis is on strengthening financial and fiscal policies designed to support innovation in enterprises and on the industrialisation of research results. Such policies include tax incentives to support technological progress (for example, an additional deduction for R&D spending by enterprises) and improvement in the evaluation and reward system for S&T results. They also include a range of commitments on intellectual property management: improvement in IPR laws and regulations, stricter enforcement and protection, the establishment of a technology property rights exchange and the promotion of technological standards in conjunction with IPR.

## 10.2 Contextualisation and interpretation

### 10.2.1 Sectoral implications

STI cuts across many sectors of the economy. Individual production ministries are free-standing units responsible for the entire range of tasks relevant to their output, but their scientific or technological innovation activities are often shared with the Ministry of Science and Technology (MOST) and, in some cases, with the Chinese Academy of Sciences (CAS) and the Natural Science Foundation of China (NSFC).

Many production ministries have long had their own tied research institutions, and even tied universities. This practice derives from the era of Soviet Russian influence; and since the 1950s, there has been no significant divide between S&T research and the practical application of the results of that research – innovation. In general, the results of the innovation process have played out through state-owned enterprises (SOEs) and other government-directed production units, not through commercial companies.

MOST was founded in 1998. It has fulfilled an overarching ‘supervisory’ role, embracing all scientific and technical activity except for military research, under the direction of the government. It provides policy advice to the government, is the principal channel for the distribution of research funds and decides which technologies should be prioritised for government spending. Ministries are obliged to heed MOST’s views and to cooperate with it. In practice, however, there are often conflicts of view, as the various sectors controlled by their respective production ministries have their own agenda.

Both the CAS and the NSFC promote S&T research to the potential benefit of all sectors. The CAS has more than one hundred research institutes and is the main source of expert scientific advice (as opposed to policy advice) to the government. The NSFC acts as a kind of multi-disciplinary research council.

All three bodies, MOST, the CAS and the NSFC, are funding bodies. Between them, they distribute funds from the National High-tech Research and Development Programme (the ‘863 Programme’, launched in March 1986) and the Key Basic Research Programme (the ‘973 Programme’, launched in March 1997) to individual scientists and research institutions throughout China. Some of the funding passes from the government through MOST to the other bodies, although the CAS also has its own substantial funds. In recent years, MOST has also operated its own ‘Torch Programme’, focused on building research links with industry and the establishment of science parks across the country. The funding situation is extremely complex, and there is ample scope for disagreement and mutual jealousy over how the money should be spent.

Thus, to a significant degree, research at the higher levels in China is undertaken by scientists working in a research environment and through research structures that are not sector-specific. These structures do not mesh particularly well with the aspiration of some people to promote a vibrant research culture in *private* corporations. Rather, they work better with SOEs, of

which there is a continuing substantial presence. This issue is discussed further below.

### 10.2.2 Policy implementation

Looked-for breakthroughs in particular areas of science (see 10.1, objective [a], p.88) will be achieved through the provision of additional state funding by way of the existing channels described above: money from the '863' and '973' programmes and other sources, distributed by MOST, the CAS and the NSFC. These funds will be allocated to targeted projects in areas of research deemed important by the three bodies<sup>145</sup> in discussion with the government.

Central to setting up a 'technology innovation system' with enterprises as the key players (10.1, objective [b], p.88) is likely to be the response of research institutions and individuals not now directly tied to industry to much more routine collaboration through strategic innovation alliances. And precisely how these alliances would work in practice remains to be seen. Achieving them is the desired outcome within the organisational scope of central government, although the programme to assist SMEs will require local knowledge and input, and may be devolved to local administrations.

In addition to removing roadblocks and anomalies in the existing system, fulfilment of the third broad objective, to strengthen S&T infrastructure (10.1, [c], p.89), will primarily require the establishment of 'technology centres' in suitable enterprises – both state-owned and private – and technology 'service platforms' aimed at enterprises. The principles of 'sharing', 'open access' and 'efficient utilisation' of technology suggest an intellectual property culture that may be inimical to Western practice but is entirely consistent and rational in a context in which the State continues to play a key economic role.

The fourth goal (10.1, [d], p.89) focuses on financial and fiscal policies to support innovation in enterprises and the commercialisation of research. Introducing a tax deduction for money spent by enterprises on R&D smacks of a market-based approach, but the proposal to evaluate and reward enterprises for S&T achievements is strongly reminiscent of former command economy practices. Success in tightening and enforcing legislation to protect intellectual property will ultimately depend on the effectiveness of the law courts.

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<sup>145</sup> The projects are elaborated in detail in the 2020 Medium to Long-Term Plan for Science and Technology.

### 10.2.3 STI policy: risks and challenges

The Chinese government faces risks and challenges in its efforts to formulate and implement policy for STI. Some of them derive from existing structures and inherited S&T issues; others arise from the 12FYP's new emphasis on 'innovation' and on 'enterprises' as the agents of R&D.

#### **Existing structures and inherited S&T issues:**

Established structures charged with promoting and distributing funds for existing academic S&T research have not always been sufficiently flexible to respond to rapidly evolving national and global priorities. In addition, there is a degree of tension between relevant bodies about the boundaries of their respective areas of responsibility.<sup>146</sup>

Recent years have seen important progress in training young Chinese scientists both overseas and in China, and the new freedom to choose one's workplace has eroded loyalty to a particular institution and its research programme. Postgraduate researchers who travel abroad do not always return to China, despite appeals to their patriotism and financial and other inducements; and at home, highly qualified young people frequently change jobs. In short, retaining highly qualified staff is a problem.

Finally, there is the unresolved issue of intellectual property. Since the end of the 1970s, the previous practice of treating S&T as common property<sup>147</sup> has given way to a belief that intellectual property, both foreign and Chinese, should be legally protected. In 2008, China unveiled a new and supposedly comprehensive strategy for the creation, use, management and protection of IPR. But problems remain, and the copying of patents and the theft of intellectual property are still major concerns.

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<sup>146</sup> This tension is a residue of earlier years, characterised by what two critics described as 'complex replication, fragmentation and inconsistencies'. See Stewart and Li, 'Changing patterns of collaboration between research organizations and business enterprises in technological innovation in China', in D.H. Brown and R. Porter (eds), *Management Issues in China*, vol. 1, 1996 (in particular, see the chapter by Stewart and Li, p.169). Apart from structures, authority in China had for many years also displayed a suspicion of sciences and technology – an attitude that reached its apogee during the Cultural Revolution. See R. Porter, *From Mao to Market: China Reconfigured* (London: Hurst & Company, 2011), Ch. 7.

<sup>147</sup> Under the command economy, S&T advances were regarded as common property, accessible to others engaged in research or productive activity. This was consistent with the notion of 'model' plants and factories, or research units, whose procedures should be emulated for the benefit of all.

A recent study finds that the policy of 'indigenous innovation', first articulated in the Medium to Long-term Plan for Science and Technology in 2006, may have implications for China's practice on intellectual property, protecting 'home-grown champions' and undermining rights of (foreign) IP developers.<sup>148</sup> The authors concede that there is a trend towards greater harmonisation with international IP norms but recommend that foreign companies should take steps to register their IP in China and use the courts more aggressively to protect their interests. Others have detected a movement away from 'indigenous innovation' (the policy adopted in 2006 intended to bring about technological self-sufficiency), as China accepts that it cannot on its own fulfil all its goals.<sup>149</sup> This may presage a greater willingness to harmonise its IP practice with international norms.

The best hope is that the increasingly common practice of well-established *Chinese* state-owned and private enterprises to defend their intellectual property vigorously in the courts presages a change in IP culture that may benefit all firms, foreign and Chinese. Even so, the 12FYP's advocacy of 'sharing', 'open access' and 'efficient utilisation' in technology matters is not wholly encouraging, precisely because the construction the Chinese government places on these terms may be different, and *may* provide a rationale for the usurpation of technology without acknowledgement or compensation.

### **Issues related to the innovation agenda:**

The demand that enterprises should be at the heart of the new 'innovation' agenda is a prominent feature of the 12FYP. Yet because of the way in which China's private sector has expanded during the past two decades, it is difficult to see how this will be achieved. The entrepreneurial genius that has contributed so much to China's export success, and thereby its rising prosperity, has been geared to the mass production of relatively low-technology consumer goods made to suit

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<sup>148</sup> Richard P. Suttmeier and Xiangkui Yao, 'China's IP Transition: Rethinking Intellectual Property Rights in a Rising China', Special Report, No. 29, (National Bureau of Asian Research, Seattle, Washington, USA, July 2011).

<sup>149</sup> This view was expressed by the former UK Science Counsellor and also by the resident European Adviser to the EU Science and Technology Fellowship Programme, Beijing. Interviews 1 August 2011 and 4 August 2011.

foreign tastes and using cheap labour. Turnover is rapid, profits come quickly and entrepreneurial skills have focused on merchandising and marketing, not on science, high technology or engineering.

Except perhaps in ICT, there are almost no *privately owned* Chinese companies, as there are in the West (for example, in pharmaceuticals, oil and gas, aerospace and high-tech steel manufacturing), that routinely engage in high-tech in-house research. In China, SOEs are more likely to engage in activity requiring high technology. Moreover, there still appears to be no expectation that private enterprise will be able to fund high-level S&T research or to establish any channel through which financial support could be provided.

Nor does the 12FYP make provision for an effective market-based mechanism likely to encourage the private sector to change its ways. The tax deduction for expenditure by enterprises on R&D may help enterprises (mainly SOEs) already engaged in significant R&D activity. But it offers little to those whose activities do not require high technology or use technologies that can be more cheaply or more readily secured abroad through licence, joint venture or outright purchase. Because of the scale of investment required and/or the past experience of most private entrepreneurs, activity in high-tech areas is likely to be concentrated among SOEs for the time being.

An exception to this is in ICT. Here significant numbers of young, outward-looking professionals, often trained abroad, have formed very innovative R&D operations attached to the science parks of leading universities, on the basis of which they have established production and marketing facilities. These consortia, not dissimilar to those in California's Silicon Valley, are quintessential examples of innovation. To what extent this model can be replicated in other high-tech areas of activity in China is more questionable.

China's attempt to achieve technological 'catch-up' is a very recent initiative and has coincided with a global revolution in information and communications technology, as well as in transport. China has benefited from both these revolutions to become a political and economic player of global stature. However, its pre-eminence has been achieved largely on the basis of low-tech exports manufactured with cheap labour – thus the high premium now placed on moving up the technology ladder to high-tech, high value-added production.

The Chinese government may take the view that this strategy is too important to leave its realisation to the market, especially if, as seems likely, it seeks ultimately to retain the capacity *in extremis* to act self-sufficiently.<sup>150</sup> Amid all the talk about innovation, it is likely to remain the State and the Chinese Communist Party that will direct research and development for the foreseeable future. From this perspective, 'innovation' should be understood as relating to production goals broadly set by the State rather than to 'commercialisation', as in the West. The architects and recipients of high technology in China are often not commercial enterprises in the sense normally understood in the West.

### 10.3 Implications for the EU: STI in the 12FYP and in EU 2020

In science and technology, as in other areas of activity, the EU faces a conceptual problem in its efforts to promote itself in China. The nature of the EU as an association of sovereign states is well understood within the Chinese Ministry of Foreign Affairs and at the strategic level in some other organs of the Chinese government, but at the operational level this is not always the case. For some interlocutors, the fact that each Member State within the EU has its own approach to science, technology and innovation is a source of confusion. Some view this as a major barrier to effective co-operation.

In presenting the EU to China for purposes of cooperation, therefore, it is suggested that this apparent disadvantage be turned into an advantage through the use of a phrase, such as 'shared values, diverse approaches', that emphasises the multiplicity of solutions the EU has to offer to problems that, as the Chinese themselves see, are pressing issues for both sides.

In the Europe 2020 Strategy, the EU has set out its plans for economic growth and complementary developments to be achieved by Member States by 2020. In what follows, we highlight points relating to STI that are common to EU 2020 and China's 12FYP in an attempt identify areas of potential collaboration between China and the EU.

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<sup>150</sup> Underlying this statement is the belief that in its efforts to achieve technological catch-up with China's most advanced international competitors, the CCP is seeking to secure the country's future against a wide variety of external threats. In the final analysis, the CCP's ultimate imperative is to be able to withstand any of the major catastrophes that could befall it in consequence of globalisation and its engagement with the global economy. China is unlikely to retreat from being a global player. But if it is to be fully secure, *in extremis* it must be able to satisfy all its own needs and be capable of functioning alone. Through the Party's eyes, this is the lesson of history.

### 10.3.1 Smart growth: the Innovation Union

Linking academic research in S&T more directly to the needs of commercialisation is at the heart of the strategy to achieve 'smart growth'. The new name given to the principal research funding mechanism is a reflection of this. Meanwhile, *EU 2020* seeks to enhance the R&D environment and to raise combined public and private investment in R&D to 3 per cent of EU GDP by 2020. It also seeks to create an 'Innovation Union' as one of the seven 'flagship initiatives' of the Programme.

In an earlier report,<sup>151</sup> the EC lists various factors thought to be inimical to private R&D investment within the EU. They include inadequate finance, costly patenting, market fragmentation, outdated regulations and procedures, slow standard-setting and the failure to use public procurement strategically. An additional problem is fragmentation of effort: national and regional research and innovation systems work on separate tracks, often leading to duplication of effort. Interestingly, some of these obstacles have also impeded progress towards establishing a more innovative culture in China.

Among the 'action points' identified by the EC in order to address such problems and help to create an 'Innovation Union' are four with particular relevance to this report:

- completing the European Research Area (ERA) to deliver the S&T research that necessarily precedes innovation, in order to promote common approaches to quality assurance, the mobility of researchers and the cross-border operation of funding agencies;
- focusing EU funding instruments on 'Innovation Union' priorities, thereby reinforcing industry-driven priorities;
- promoting the European Institute of Innovation and Technology as a model of innovation governance in Europe, so as to encourage a stronger role for entrepreneurship; and
- enhancing access to finance for innovative companies through collaboration with the European Investment Bank, national bodies and private capital.

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<sup>151</sup> EC, *EU 2020 Flagship Initiative: Innovation Union*, available at [http://ec.europa.eu/research/innovation-union/pdf/innovation-union-communication\\_en.pdf](http://ec.europa.eu/research/innovation-union/pdf/innovation-union-communication_en.pdf) (accessed on 21 June 2011).



All these areas have parallels in China's innovation context. It is therefore recommended that an ongoing dialogue on 'governance issues' and capacity-building, as they relate to innovation, should be established between the EU and appropriate ministries and organisations in China. In this way, experience can be shared, knowledge can be gained by each side of the other's practices, and potential cooperation on major projects of mutual commercial benefit can be explored. Such a dialogue would be consistent with the EU's explicit wish that its Member States undertake joint S&T initiatives vis-à-vis third countries. It could embrace not only S&T but also the entire infrastructure for innovation, including educational, legal and financial aspects, the upgrading of management and the implications for foreign trade and investment.<sup>152, 153</sup>

### 10.3.2 Towards collaboration on strategic challenges

Another *EU 2020* proposal is that 'Innovation Partnerships' should be set up to address specific challenges shared across the EU and 'where there is a large new market potential for EU businesses'. It is clear that EU companies will increasingly confront Chinese high-tech enterprises head on in their efforts to develop projects requiring substantial investment. In China, there are national goals to secure strategic technologies, and to fill gaps. China is also a single state, with a one-party government able to take decisions that are unlikely to be challenged. By contrast, within the EU individual countries and companies pursue their own agendas.

Such considerations suggest the benefits of a concerted approach by EU Member States and of efforts to undertake projects jointly *with* China rather than in opposition to it, whether in research or in the commercialisation of technology. The International Thermonuclear Experimental Reactor (ITER) fusion reactor programme, a project involving both research and manufacture at a very high level of technology, is one very successful example of EU-China collaboration.

Recent significant progress towards facilitating closer collaboration between the two sides has focused mainly on the S&T prerequisites to the later stage of

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<sup>152</sup> Senior representatives of the Chinese Academy of Science and Technology for Development at the Ministry of Science and Technology indicated that they would very much welcome a dialogue with the EU on these issues. Interview by Professor Robin Porter, 3 August 2011. For a full list of interviews conducted by Professor Porter on behalf of this project, see p.7.

<sup>153</sup> It is understood that by the time this paper is published, the relevant EU Commissioner will have formally proposed such an ongoing dialogue to the Chinese side. The US already has such a mechanism within its existing Strategic and Economic Dialogue with China.

'innovation/commercialisation'. Important positive developments include the publication in 2009 of a paper on 'China-Europe Research Collaboration as a Strategic Policy Priority',<sup>154</sup> as well as the establishment in 2010 of the ERA's Strategic Forum for International S&T Cooperation (SFIC), in which much attention is focused on China. Subsequently, an SFIC task force on 'priority setting' for relations with China was set up, and, after a visit to China by two SFIC experts, a report on ways of furthering S&T cooperation was published.<sup>155</sup>

The report recommended infrastructure for research and innovation ties with China. Its principal recommendations (with outcomes as of August 2011) were as follows:

- that a workshop on 'Approaching China' be held by the SFIC (achieved: held in Brussels, May 2011);
- that a 'strategy framework' be developed for approaching China (not yet achieved);
- that an EU science and technology platform be established in Beijing. It would involve S&T counsellors of Member States and potential Chinese interlocutors and carry out monitoring and information gathering (partly achieved: the counsellors meet monthly in Beijing, but as yet without Chinese interlocutors);
- that studies be undertaken to help facilitate S&T cooperation (partly achieved: a task force on researcher mobility and on innovation has been set up);
- that research be undertaken on a 'Research and Innovation Framework for the Development of Green Technologies to Mitigate Climate Change in China' (proposed jointly by the EU S&T Office in Beijing and the Chinese Ministry of Science and Technology) (not achieved, but an EU-China Clean Energy Centre has been established at Tsinghua University as a project of cooperation between the EU and China's NDRC);

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<sup>154</sup> The paper was compiled by Denis Fourmeau, Deputy Counsellor, Science and Technology Section, EC Delegation, Beijing.

<sup>155</sup> Manfred Horvat and Svend Remøe, 'Background Report on Steps towards Developing Strategies for S&T Co-operation with China', September 2010, available at [http://www.minedu.fi/export/sites/default/OPM/Tapahtumakalenteri/2011/05/Approaching\\_China\\_liiteet/ApproachingxChina\\_BackgroundxReport\\_rev\\_2\\_.pdf](http://www.minedu.fi/export/sites/default/OPM/Tapahtumakalenteri/2011/05/Approaching_China_liiteet/ApproachingxChina_BackgroundxReport_rev_2_.pdf) (accessed on 2 September 2011).

- that IPR developments in China be monitored on an ongoing basis (partly achieved: formerly monitored by the EU S&T Office in Beijing, this task has now passed to the Trade Section; a project to train Chinese interlocutors in IPR appears to have been cut for budgetary reasons);
- that instruments for cooperation at both the EU and national level be investigated and improved (partly achieved: some limited in the form of a 'clearly arranged set of instruments commonly applicable', such as joint calls between the NSFC and some EU Member State funding bodies);
- that a 'Science and Technology Fellowship Scheme' be set up (achieved: successfully implemented but should be extended (see below, pp.101-02));
- that a network of European think tanks with a focus on China be established for the purposes of continuous monitoring, assessment and foresight (not yet achieved); and
- that steps be taken to improve the visibility of the ERA and that consideration be given to the establishment of a European science house in Beijing (not achieved, as subject to continuing debate).

The principal mechanisms for funding research collaboration have been the longstanding Framework Programme (in its current guise, the Seventh Framework Programme for Research and Technological Development, or FP7) and, within the FP7, the Marie Curie Fellowships. The Framework Programme, now open to participation by Chinese researchers, is likely to remain a major instrument for promoting research collaboration between European and Chinese scientists. Efforts to simplify application procedures promise to generate greater levels of interest and take-up.

The launch in 2011 of the EU's Science and Technology Fellowship Programme in China (STF China) is an important recent initiative. Its goal is to encourage EU researchers to engage in Chinese R&D issues and to familiarise them with China and Chinese science in order to facilitate meaningful and long-lasting contacts between EU and Chinese scientists. The first two intakes of 30 EU researchers each travelled to China in summer 2011 to begin six months of instruction in Chinese and research culture and 18 months of research in a Chinese host organisation.

This Programme, which lies outside FP7, addresses European researchers who might otherwise be discouraged from spending time in China because of

unfamiliarity with the language, culture and research environment. It is generally considered to have been a success, and has been praised by individual participants and institutions on both sides. It has reportedly also helped to leverage funding from the NSFC to facilitate bringing European scholars to China.<sup>156</sup> However, the Programme has been funded for little more than two years, and the initial funding is due to end in mid-2012.

There is a strong case for renewing the Fellowship Programme's funding as a matter of urgency so as to uninterruptedly expedite the next call for applications and also for continuing it for at least 10 years. That would put it on a par with a similar programme conducted in recent years with Japan. If the programme is allowed to lapse, the negative impact on EU-China relations is likely to be greater than if it had never been implemented.<sup>157</sup>

To date, the EU's role has been primarily one of facilitating and promoting S&T links with China *on behalf of Member States*. It is, however, the individual states themselves, their scientists and their high-tech organisations that have carried out actual research with Chinese counterparts. This has been conducted sometimes with the benefit of EU Framework Programme funding, sometimes multilaterally with colleagues elsewhere in the EU and with China, but more usually it has been carried out in the context of a bilateral relationship using home-country and, increasingly, some Chinese funding.

There are many, and many forms of, collaboration projects in scientific research between European and Chinese scientists. Most heavily represented among European states are France, Germany, Holland, Italy, Sweden and the UK, as well as Finland in ITC. Most of them have science diplomats in Beijing and sometimes in relevant consular districts; some also have research organisations with their own offices in China.<sup>158</sup> Not all EU Member States, however, keep central records of their STI ties with China, nor does the EU at present keep this information. In China itself, project lists exist, but they tend to be institution- or funding body-based, and it appears that there is no comprehensive record of

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<sup>156</sup> Interview with the Lead Expert, EU Science and Technology Fellowship Programme, Beijing, 4 August 2011.

<sup>157</sup> Commercial sponsorship from EU high-tech companies and their involvement could be sought as a means to defray the costs of this programme. The possibility of Chinese co-funding might also be explored.

<sup>158</sup> For example, Germany has the Humboldt Foundation, the Sino-German Science Centre, the DFG, the DAAD, Fraunhofer, the Max Planck Institute; France has a network of Franco-Chinese laboratories promoting joint research in various areas of science; and the UK has the Research Council's office in Beijing.

them. Compiling this information would be a simple exercise and would help to raise the visibility of EU science activity in China.

### 10.3.3 Issues and opportunities in the EU-China STI relationship

Here we seek to investigate how, as China implements its 12FYP (and its more detailed Medium to Long-term Plan for Science and Technology), the EU can expand its STI engagement with China.

#### **Process: science and technology**

A priority need is to put in place a mechanism through which EU Member States can regularly gather and exchange information about developments in Chinese S&T and about their own bilateral and multilateral initiatives in China.<sup>159</sup> This would help to coordinate the various initiatives.<sup>160</sup>

Regular meetings involving interlocutors from MOST, the Chinese Academy of Sciences and the NSFC would acquaint science counsellors at the embassies of EU Member States with current Chinese priorities and concerns and help them to identify areas in which EU scientists might offer assistance. Such information could be notified to relevant science bodies in Member States, as well as to EU funding bodies.

By such means – and others, including the EURAXESS<sup>161</sup> website – the collective EU S&T effort via-à-vis China would not only gain greater publicity among Chinese counterparts but also benefit from the display of a common front, dispelling a widespread feeling that Europe punches below its weight in scientific activity in China. All the Member State S&T counsellors interviewed for this project felt that the visibility of EU activity in this area could be improved.

Further consideration might be given as well to SFIC experts' recommendation, made in their 2010 report *Approaching China*, that a

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<sup>159</sup> Such a mechanism might be based on the framework of existing regular meetings of science counsellors in Beijing but be expanded to include Chinese interlocutors.

<sup>160</sup> It was suggested by one Member State's Science Section that local embassy staff should also be included in these meetings, as they are likely to be more closely acquainted with the history of various projects – science counsellors are generally rotated every three years. It was also proposed that the science staff of different Member States should jointly undertake various types of public activity in order to present a 'European face' in science to the public. Interview by Professor Robin Porter, Beijing, 4 August 2011.

<sup>161</sup> EURAXESS (ec.europa.eu.euraxess) is the service portal for the European Research Area.

physical EU science centre should be set up in Beijing. Opinion was evenly divided among the S&T sections of Member States about the potential value of such a facility. Some expressed a preference for the use of a virtual network. But others favoured a physical centre, where visiting EU scientists could mix with their Chinese counterparts and where Chinese dignitaries could also be received. They pointed out that the Chinese establishment continues to regard bricks and mortar as evidence of genuine commitment and that the existence of such a centre would do much to raise the EU's profile in science.<sup>162</sup>

There was also much support for the EU having both a drop-in S&T facility and an expanded virtual network. One suggestion was that the EU Science and Technology Office and the EU Science and Technology Fellowship Office, currently located in different parts of Beijing, should be combined into a single facility, with possible involvement and financial support from high-tech European companies. But science counsellors were united in their opposition to trying to group all Member State science sections in such a facility.

#### **Process: innovation and commercialisation**

Engaging European firms in the innovation process in China may be harder to achieve. For commercial reasons, high-tech firms will think more in terms of competition than cooperation in approaching the Chinese market. But once they are involved, a further major issue is the fear of intellectual property loss.

A minor improvement is that European SMEs are now able to join research institutes in seeking FP7 funding for projects involving China. In this way, high-tech SMEs and research institutions can cooperate in processes that promise to generate mutually beneficial innovation in China.

But for the time being, very few Chinese private sector companies are motivated to engage in long-term R&D investment. The 12FYP's aspirations notwithstanding, there is no guarantee that such private investment will take place. For the foreseeable future, market forces in China are unlikely to generate sufficient incentives to encourage the

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<sup>162</sup> Germany already has a science centre in Beijing's Haidian district, where, until recently, the UK Research Council's office and 'drop-in' facility have been located.

commercialisation of high technology, as understood in the West. Rather, such investment is likely to be undertaken by SOEs, which have the resources and inclination to invest in high technology and R&D. (Ultimately, investment is determined by the State in accordance with its technological priorities.) Despite its role as the means of translating S&T into production, innovation in China is unlikely to be primarily market-driven.

In such circumstances, one way of linking EU 2020's innovation aspirations with those of China as set out in its 12FYP would be to encourage EU companies in a given area of technology to form loose industry-based consortia – whether in one or more Member States – for the purpose of facilitating and monitoring Chinese priorities and requirements with respect to that technology. In this way, the work of the consortia would serve European business interests while also enhancing the EU's status as a provider of, and partner in, high technology.<sup>163</sup>

## 11 Issues of Sustainability: Energy and the Environment

China has been much criticised for its position on climate change and for the environmental consequences of its remarkable reform-led growth since 1978. In fact, however, concern about the scale of environmental degradation and pressure on scarce resources, including energy, have been a consistent theme of the Hu Jintao-Wen Jiabao administration. In recent years, the threat posed by climate change to China's own economy has been recognised too. The importance attached to environmental issues was apparent in the upgrading in March 2008 of the former State Environmental Protection Administration to full ministerial status under the name of the Ministry of Environmental Protection (MEP). Later in that year, the State Council issued China's first White Paper on Climate Change – but its preparation was led by the NDRC, not the MEP. Meanwhile, research on sources of alternative energy has been intensified; and even though China has not subscribed to international emission reduction targets, it has set its own targets for the reduction in carbon intensity in energy use.

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<sup>163</sup> As in other spheres of relations between the EU (including its Member States) and China, the work of the consortia should seek to facilitate the establishment of a long-term mutually beneficial relationship, thereby helping to create a sustainable and enduring economic partnership.

The 12FYP's advocacy of development sustainability is stronger than in any previous FYP:

We will uphold the development of a resource-conserving and environmentally friendly society ... while accelerating the transformation of our pattern of economic development. We will ... implement ... the policy of conserving resources and protecting the environment, conserve energy, reduce greenhouse gas emissions, develop a circular economy, popularise low-carbon technology, actively respond to climate change ...<sup>164</sup>

The importance attached to sustainability is reflected in the Programme's inclusion of 10 chapters that address related issues.<sup>165</sup> These issues fall into two main categories: energy and the environment. Although there are overlaps between the two, for analytical convenience each is considered separately below.

## 11.1 Energy

### 11.1.1 Headline content

The 12FYP sets out a wide range of energy initiatives, all of which offer opportunities for collaboration between China and the EU. The Programme's main thrust is to improve energy efficiency and to promote a low-carbon development strategy. Its headline themes may be summarised as follows (for more detail, see Annex D):

- **Energy efficiency**
- to promote the use of diversified and clean-energy sources;
- to optimise the layout of energy development;
- to strengthen the construction of energy transmission lines;
- to strengthen energy conservation management; and
- to enhance and enforce energy conservation standards.

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<sup>164</sup> CDTD, *Twelfth Five-Year Plan*, Ch. 2 ('Guiding Principles'), p. 11 and *Gangyao*, p. 7. A circular economy is taken in this paper to mean one in which waste, both biological and industrial, is recycled and turned into inputs.

<sup>165</sup> The most important chapters are Ch. 11 ('Accelerate the Reform of Energy Production and Use'); Ch. 21 ('Actively Respond to Global Climate Change'); Ch. 22 ('Strengthen Resource Conservation and Management'); Ch. 23 ('Vigorously Develop a Circular Economy'); Ch. 24 ('Intensify Environmental Protection'); Ch. 25 ('Promote Ecological Protection and Repair'); and Ch. 26 ('Strengthen the Construction of Systems for Water Conservation and Disaster Prevention and Mitigation'). On environmental and resource-related pricing issues, see Ch. 49; and on related governance issues, see Ch. 61.



- **Low-carbon development strategy**
- to develop a circular economy and to formulate low-carbon technologies;
- to implement exemplary projects of carbon dioxide use in the petrochemical industry; and
- to control greenhouse gas emissions.
  
- **Energy security**
- to guarantee adequate supplies of energy to meet growth requirements

### 11.1.2 Contextualisation and interpretation

#### 11.1.2.1 Sectoral implications

The energy industry in China was for many years highly fragmented, comprising various ministries and other organisations, each of which was responsible for a specific energy source or for a defined role in its transmission. Many critics have commented that this system perpetuated a tendency whereby China's energy organisations worked in silos, jealously protecting their prerogatives and unwilling to cooperate in activities that would have facilitated a structured transition to greater reliance on sustainable energy sources, a transition that some would undoubtedly have seen as threatening to their very existence. An effort to achieve greater control by establishing in 1988 an overarching Ministry of Energy failed within a few years. Throughout the 1990s and beyond, there was continued criticism of fragmented decision-making and insufficient planning for energy exploration, consumption, savings and reserves.

In 2010, however, a new energy body with 'super-ministry' status was established. This was the National Energy Commission (distinct from the National Energy Administration under the NDRC – in effect the NEC's bureaucracy), which is responsible for drafting national energy plans, reviewing energy security and coordinating international cooperation on energy matters. It is still too early to assess the impact of this institutional initiative on the implementation of China's energy policies, although Wen Jiabao's appointment as Chairman of the Commission, and the NDRC's representation on it, are positive signs.

Table 4 provides some indication of the shifting pattern of energy consumption over the five-year period from 2005 to 2010.

Table 4: China's energy consumption, 2005-10\*

Energy source	Consumption (million tonnes, standard coal equivalent)					
	2005	2006	2007	2008	2009	2010
Coal	1,671 (70.8)	1,839 (71.1)	1,994 (71.1)	2,049 (70.3)	2,159 (70.4)	2,304 (70.9)
Oil	467 (19.8)	499 (19.3)	527 (18.8)	533 (18.3)	549 (17.9)	536 (16.5)
Natural gas	61 (2.6)	75 (2.9)	93 (3.3)	108 (3.7)	120 (3.9)	140 (4.3)
Hydro, wind and nuclear power	0 (6.8)	173 (6.7)	191 (6.8)	224 (7.7)	239 (7.8)	270 (8.3)

\*Figures in brackets show each sector's share of total energy consumption.

Source: *Zhongguo tongji zhaiyao*, 2011, p. 141.

China currently operates 13 nuclear power reactors on four different sites.<sup>166</sup> Some 27 more are said to be under construction, although since the Fukushima nuclear disaster in Japan, there has been a temporary stay on approval of new plants. In 2011, 1 per cent of electricity was produced from nuclear power, although the NDRC has stated its intention to increase this to 6 per cent by 2020 (an implied increase in capacity from just over 10GW to 70–80 GW). China is also a participant in the international ITER experimental fusion reactor project.

Comprehensive estimates of sectoral shares in total energy consumption for 2015 are not given in the 12FYP. It is reported, however, that a target has been set for non-fossil fuels (including hydro, solar, wind, bio and nuclear) to provide 11.4 per cent of China's energy by 2015, rising to 15 per cent by 2020. Despite the rise in the use of non-fossil fuels, heavy reliance on coal is bound to continue, although efficiency in its use will be enhanced through the application of new clean-coal technology. 'Smart grid' technology will also be developed in order to improve the efficiency and reliability of China's power transmission systems. The possible capping of annual total energy consumption at 4.2 billion tonnes of standard coal equivalent is under discussion at the time of writing.

<sup>166</sup> IAEA, Power Reactor Information System, [www.iaea.org/programmes/a2](http://www.iaea.org/programmes/a2) (accessed on 26 July 2011).

Approximate targets for 2015, indicated by senior Chinese officials in discussions with the British embassy Energy and Climate Change Section, are as follows:<sup>167</sup>

Table 5: Energy consumption targets for 2015

	Planned consumption (2015)	Planned reduction (2015)
Coal	4,000 m. tonnes	n.a.
Oil	500 m. tonnes	n.a.
Natural gas	250 bn m <sup>3</sup>	n.a.
Hydro	284 GW	n.a.
Wind power	90 GW	n.a.
Solar power	10 GW	n.a.
Nuclear power	40 GW	n.a.
Grid	1,470 GW	n.a.
Energy intensity per unit of GDP	n.a.	16%
Carbon intensity per unit of GDP	n.a.	17%

Source: Senior Chinese officials, British embassy, Energy and Climate Change Section, 2011

### 11.1.2.2 Policy implementation

Implementation issues associated with China's energy policies under the 12FYP fall broadly into three categories: those relating to ministries or other authorities engaged in energy production or distribution; those relating to industrial and domestic consumers; and those relating to research activities intended to encourage and facilitate the wider use of sustainable energy.

#### **Energy ministries and organisations<sup>168</sup>**

Strategic policies decided by the National Energy Commission must be implemented through these organisations, all of which have ministry status. It is too soon to judge how effective they will be as facilitators of policies formulated by the NEC.

<sup>167</sup> Professor Porter's interview with the Energy and Climate Change Section, British embassy, Beijing, 11 August 2011.

<sup>168</sup> The bodies under the supervision of the new National Energy Commission that have a major role in energy production and distribution are the State Electricity Regulatory Commission, the State Administration of Coal Mine Safety; the Ministry of Water Resources; the Ministry of Land and Resources; the China National Petroleum Corporation; Sinopec; and the State Grid Corporation of China. See Lan Xinzhen, 'Who'll turn on the lights?', *Beijing Review*, 29 November 2007.

## **Energy consumers**

The most important claimant on energy is the industrial sector, which accounts for about two-thirds of demand. Many industrial users are major SOEs, which can exert great pressure in securing their energy supplies. But domestic and commercial users' share of energy consumption is rising rapidly, especially, under the impact of accelerating urbanisation, in major cities. These claimants' activities affect the efficient implementation of central policies that seek to promote energy efficiency and low-carbon solutions and also pose technical challenges to the distribution of ever larger supplies of power.

## **Research activities**

Research into renewable energy sources (wind and solar power, hydropower, biomass, geothermal and wave energy) is an important part of policy. It is carried out by State Key Laboratories and other research units under MOST, the CAS and a series of dedicated new 'national energy and research centres', as well as through international collaborative projects such as the EU-NDRC Clean Energy Research Centre and the BP-Tsinghua Alternative Energy Research Centre, both at Tsinghua University in Beijing. In addition, other projects, many with an international dimension, are exploring carbon capture and storage and other low-carbon solutions still using coal as the primary energy source.

In all these cases, the challenge comes with implementation on a significant scale, in which the factors described above and below play an important part.

### **11.1.2.3 China's energy policy: risks and challenges**

Throughout the reform period, there has been an underlying conflict, even at the highest levels of the CCP, between 'developmentalists' and 'environmentalists'. The former have advocated growth at any price. By contrast, the latter have increasingly warned that the economic and social threat posed by continued growth, based mainly on fossil fuels, could ultimately destabilise the country. The 'environmentalist' view is inherent in 12FYP energy policy proposals (note its advocacy of greater reliance on renewables). But this emphasis could change if international attitudes were to shift back towards greater tolerance of fossil fuels.

Another challenge lies in the vested interests of fossil fuel ministries and organisations. In recent years, these bodies have acquired a stake in the 'fossil-fuelled growth status quo' in terms of both their respective areas of

responsibility and the career paths of their principal staff. Overcoming such interests is made more difficult by the Chinese cultural phenomenon of reciprocal obligations and expectations.<sup>169</sup>

The low price of coal, the high cost of low-carbon solutions and greater reliance on market mechanisms to fulfil China's energy goals are another set of issues that pose risks and challenges for the Chinese government. For many years, the existence of enormous coal reserves<sup>170</sup> kept the price of energy artificially low. But against the background of resource pressures and rail freight bottlenecks, the introduction in recent years of coal imports has made China more susceptible to the vagaries of fluctuations in international market prices.

For this reason, as well as because of growing concern about carbon emissions, experiments have been undertaken in recent years whereby some consumers have had to pay significantly higher prices for coal and other sources of primary energy. For their part, industrial users have been charged a premium for renewable or low-carbon sources of energy in order to help fund further R&D in this area. Such developments demonstrate the Chinese government's willingness to resort to market and other mechanisms in order to help meet its energy policy goals.

The 12FYP's commitment to develop domestic energy production notwithstanding, the increasing share of China's primary energy needs that are now met by imports<sup>171</sup> highlights a risk to its energy security. For example, China currently has oil interests in Kazakhstan, Russia, Venezuela, Sudan, West Africa, Iran, Saudi Arabia and Canada – countries and regions that, with the exception of Canada, face some degree of political volatility. Oil exploration by China in the South China Sea, contested by a number of neighbouring states, is likely to yield no greater security of supply. For coal imports, the situation is somewhat more secure, with Indonesia, Australia, Vietnam, Mongolia and Russia as major suppliers.

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<sup>169</sup> Nor can the NEC's status as the arbiter of energy supply and distribution policy be guaranteed after 2012, when Wen Jiabao ceases to be Chairman. If its status is not maintained, former rivalries and tensions among energy organisations could re-emerge, thwarting the coherence of China's energy policy.

<sup>170</sup> In 1990, it was estimated by the government that at current rates of consumption, China had sufficient coal reserves to last for some 750 years.

<sup>171</sup> In 2011, China expects to suffer an energy shortfall of 30 million Kw. Lan Lan, 'China's energy imports to increase', *China Daily*, 2 June 2011.

These factors, all of which could undermine the implementation of China's energy plans, should be kept in mind in assessing the viability of the energy content of the Twelfth Five-Year Development Programme.

### 11.1.3 Implications for the EU

The EU's *2020 Programme* contains a strong commitment to 'sustainable growth', with both energy and the environment featuring strongly among the Programme's initiatives. Moreover, there is broad consensus among EU Member States that a transition to a low-carbon economy, based in large part on renewable energy supplies, is highly desirable.

Both individual Member States and the EU itself have undertaken a number of energy initiatives with China that complement shared Chinese and European goals relating to GHG emissions and climate change. Such initiatives include joint research into clean coal and other low-carbon solutions, exchanges on wind and wave power, establishing joint laboratories, funding institutes to promote research into all forms of renewable energy, as well as commercial projects of technology transfer and consultancy. In addition, discussions have taken place on governance issues involved in the transition to a low-carbon future.

Relations between the EU and/or EU Member States and China concerning S&T have been 'process-led'. By contrast, their relations apropos of energy and 'sustainability' issues have been 'issue-led'. For both sides, those issues include specific scientific and technical problems in need of resolution, and discussions of them are informed by the need to find common or complementary positions in the face of mutual hazards.

In short, there is considerable scope for upgrading EU and Member State engagement in this area. Europe has enormous expertise across a great variety of energy and sustainability technologies. Establishing research links and promoting commercial technology transfer will depend on careful monitoring of 12FYP energy policies and goals and on responding promptly and thoughtfully in those areas where Europe has a strong comparative advantage. In this way, there is a real possibility that the EU and its Member States can establish themselves as China's favoured partner(s) for collaboration in those areas.

## 11.2 Environment

### 11.2.1 Headline content

There are clear overlaps in terms of environmental policy goals between the EU/EU Member States and China, and they offer strong collaborative opportunities. The principal focuses of China's 12FYP are climate change and the creation of a 'green' economy, although the Programme also touches on other important environmental issues. Headline themes are summarised below (for more detail, see Annex E).

- **Climate change**
  - to control greenhouse gas emissions;
  - to enhance China's capacity to adapt to climate change; and to engage in international cooperation on climate change.
  
- **Creation of a 'green' economy**
  - to develop a circular economy, based on 'cyclic' production and resource recycling;
  - to promote 'green' consumption; and
  - to strengthen the policy framework and technological support for environmental affairs.
  
- **Environmental pricing policy**
  - to rationalise resource pricing;
  - to reform environmental protection charges; and
  - to introduce market mechanisms in support of trading resources and environmental property rights.
  
- **Other environmental aspects**
  - to reduce pollution emissions;
  - to protect against environmental risks;
  - to strengthen environmental monitoring and supervision; and to enhance environmental governance.
  
- **Ecology**
  - to put in place ecological safety barriers;
  - to strengthen ecological protection and governance; and
  - to establish an ecological compensation mechanism.

- **Water conservancy and disaster prevention**
- to increase water supplies through water diversion and other construction projects;
- to enhance flood control capacity; and
- to strengthen the prevention and control of natural disasters.

## 11.2.2 Contextualisation and interpretation

### 11.2.2.1 Sectoral implications

In terms of climate change, the potential implications of the commitment to reduce GHG emissions and energy intensity cut across all areas of productive activity. There is an overlap among the government's various energy bodies, as discussed above; and decisions on what and how much to produce – let alone the consequences of such decisions in terms of the use of carbon-emitting energy – also involve ministries and other bodies responsible for producing across virtually the entire range of goods (from steel to chemicals, automotive products, plastic products and fertilisers for agriculture). The inference is that to bring about the profound changes outlined in the 12FYP – the introduction of low-carbon solutions over a very wide range of activities is but one example – will require the nurturing of a consensus among all parties involved in implementing the new policies.

The 12FYP's interpretation of a 'green' economy is expressed mainly in terms of introducing the extensive recycling of materials and what in the West would be described as a 'cradle-to-cradle' approach to production. But even within this quite limited definition, the goal will be fulfilled only through a cooperative approach involving many ministries and other organisations, both government and private.

Successful implementation of 12FYP measures designed to address other environmental problems – for example, pollution, resource conservation, the incidence of natural disasters, ecological preservation and the loss of biodiversity – will require unprecedented commitment by those responsible for governance in those areas. And it will also require the establishment of an appropriate regulatory framework and implementation of capacity-building across sectors and government departments.

### 11.2.2.2 Policy implementation

Responsibility for implementing China's proposed policy on climate change, primarily one of reducing carbon intensity in industrial and other economic activities, lies with various production ministries and bodies in conjunction with



the Ministry for Environmental Protection. The need to take account of *domestic* consumption of fossil fuel energy underlines the challenge of implementation.

Insofar as the term seems to be used synonymously with 'recycling economy', putting in place a 'green' economy depends on individual ministries and enterprises taking the lead in promoting the use of recycled resources (materials as well as 'lost' energy). The 12FYP's reference to market mechanisms notwithstanding, the role of central government in encouraging and facilitating the pursuit of a 'green' economy is likely to be significant.

Fulfilment of other environmental objectives within the 12FYP will also require active involvement by various central government departments, as well as that of *local* authorities throughout China.

### 11.2.2.3 China's environment policy – risks and challenges

#### **Climate change**

China's first engagement with international environmental protection frameworks was in 1972, when it sent a delegation to the UN Conference on the Human Environment. Political factors associated with the Cultural Revolution (1966–76) and, after 1978, the imperative of growth maximisation, later weakened its commitment to the environment. China did sign the 1997 Kyoto Protocol, but on the basis of the principle of 'common but differentiated responsibilities', which permitted it as a developing country to avoid committing itself to specific targets for reductions in GHG emissions. More recently, the government's stance has changed. Thus, in Copenhagen and Cancun China offered voluntary targets for reductions in carbon intensity, but not in overall emissions. A critical consideration is that historical factors make it extremely unlikely that China will accept *any* targets that are seen to be imposed from outside.

The challenges of implementing measures to counteract climate change are many and complex. Fragmented structures for energy supply and distribution (see above, Section 11.1.2.1) offer scope for significant slippage in the application of policy. The priorities, usually growth-orientated, of many local (provincial and sub-provincial) enterprises and government and Party officials are a further major obstacle to implementation, although it is striking that some one hundred cities are reported to have applied for inclusion in the national pilot scheme for

low-carbon cities.<sup>172</sup> The relative weakness of the Ministry for Environmental Protection, seen by some as a poor relation of the powerful production ministries, staffed by academics and lacking the status to enforce its will, is another potential problem.<sup>173</sup>

The threat to China of unabated GHG emissions is a major challenge. Discernible impacts of climate change in China have received increasing attention by Chinese scientists since the late 1990s.<sup>174</sup> In 2005, for example, scientists stated that if climate change continued unabated, China's domestic food production capacity by 2030 would be 8 per cent less than in 2005.<sup>175</sup>

### **The 'green' economy**

References to a 'green' economy in the 12FYP mostly relate to a recycling agenda. Recycling is not new to China. Thus in recent years, Chinese environmentalists have espoused the 'cradle-to-cradle' concept in manufacturing whereby the potential for recycling materials is built into manufacturing processes from the start.<sup>176</sup> Individual producers will doubtless themselves weigh the relative costs and benefits of recycling. But in major state-owned enterprises, the role of central government as a force for facilitating a gradual shift to the recycling approach is already apparent and is likely to increase.

Recycling is not, however, synonymous with a 'green' economy. A genuine 'green' economy should not only embrace environmentally conscious practices – evidenced by the sustainable production of a high proportion of output – but also facilitate a shift to a pattern of production in which a major focus is manufacture and the application of devices that will ultimately generate a sustainable lifestyle. A long-term

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<sup>172</sup> Professor Porter's interview at CASS, Institute for Urban and Environmental Studies, Beijing, 1 August 2011.

<sup>173</sup> Some in Beijing argue, however, that the MEP's effectiveness has improved recently.

<sup>174</sup> These have included drought, floods and other extreme weather events, the drying up of water courses and lakes, the loss of topsoil, the effects of acid rain and the significant northward movement of bands of sub-tropical and warm weather.

<sup>175</sup> Information from a seminar in 2005, attended by Professor Porter in his capacity as UK Science Counsellor in Beijing. The same figure was given to him in March 2011 during a meeting at the British embassy in Beijing.

<sup>176</sup> The paradigm originated in the work of William McDonough and Michael Braungart. See their *Cradle to Cradle: Remaking the Way We Make Things*, North Point Press, 2002. See also Pan Yue, 'The harmonious and environmentally conscious society', in Yang Dongping (ed.), *China Environment Yearbook*, vol.2 (CASS) (Leiden: Brill, 2008), pp.55-57.

scenario would provide for the employment of increasing numbers of people in the manufacture and servicing of such devices so that individual citizens can become active contributors to the sustainability of their own lifestyle.

From such perspectives, China's challenge is to find a way of achieving this transition as part of its strategic macroeconomic endeavour to shift from the production of relatively low-tech goods for export towards the production of higher-tech items for both domestic use and export markets. Two impressive examples of progress in this direction are the manufacture and use of solar panels and wind turbines. (China is the world's largest producer of both.) Even so, the extent to which vested interests will need to be overcome in order to effect a successful transition should not be underestimated.

### 11.3 Implications for the EU

Climate change has long been a source of major concern to the EU and its Member States, and it features prominently in the EU's 2020 Programme. In terms of their development of relevant technologies, European companies are among the most advanced in the world. Individual Member States have also engaged extensively with China in this area. Their collaboration has included joint research into clean coal and other low-carbon solutions, exchanges on wind and wave power, the establishment of joint laboratories, the funding of institutes to promote research into all forms of renewable energy, the implementation of commercial technology transfer and consultancy projects. As we suggested earlier, further opportunities for both research links and commercial technology transfer lie in a careful monitoring of 12FYP goals and responding promptly and meaningfully to those opportunities to whose realisation Europe can make a significant contribution.

Following the EU-China Summit in 2005, the two sides established the EU and China Partnership on Climate Change. Its aims are to develop advanced zero-emissions coal technology based on carbon capture and storage, to reduce the cost of key energy technologies and to promote their deployment and

dissemination.<sup>177</sup> The partnership has funded three specific projects: the Clean Development Mechanism (CDM) Facilitation Project (2007–10); the EU-China Energy and Environment Programme (EEP) (2002–09); and the EU-China Cooperation on Carbon Capture and Storage (CCS) (instituted in 2006 and ongoing).<sup>178</sup>

The core of these projects has been technology transfer by European companies. However, the partnership has been subject to criticism, by both Chinese and European observers. Some on the Chinese side apparently feel that the relevant European commercial companies have been preoccupied by the profitability of the projects to the neglect of the potential public benefit to China resulting from reduced carbon emissions. Some European companies have been concerned about the perceived threat to their intellectual property as a result of collaboration.<sup>179</sup>

We do not subscribe to these criticisms in their entirety, but they do highlight a number of issues that will need close attention as the EU seeks to strengthen its engagement with China as it implements climate change policies under the 12FYP. Of particular concern is the impression, some on the Chinese side have claimed, that the EU and European companies place profit ahead of the ‘public good’ (whether the Chinese or the global public good). Few perceptions are more likely to sour the relationship faster than this. In dealing with China, European companies should acknowledge both a European ‘common purpose’ in EU-funded projects and the diplomatic objective of securing a productive long-term relationship with China. The extent to which closer monitoring of

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<sup>177</sup> Key areas identified for technical cooperation include energy efficiency and conservation and new and renewable technology; clean coal; methane recovery and use; carbon capture and storage; hydrogen and fuel cells; power generation and transmission. For more details, see *The EU-China Partnership on Climate Change: Bilateralism Begetting Multilateralism in Promoting a Climate Change Regime?* Mercury E-paper No. 8, December 2010 at [http://www.mercury-fp7.net/fileadmin/user\\_upload/E-paper\\_no\\_8\\_2011.pdf](http://www.mercury-fp7.net/fileadmin/user_upload/E-paper_no_8_2011.pdf) (accessed on 27 July 2011).

<sup>178</sup> The CDM involved dialogue, policy research and capacity-building. The EEP focused on the development of plans to strengthen EU-China cooperation in carbon capture and storage. The CCS seeks to achieve cooperation in developing, deploying and transferring clean technologies to China, to improve energy efficiency and to promote the transition to a low-carbon economy. It is intended to lead to the construction by 2020 of a ‘commercial-scale, demonstration, coal-fired power plant supplied with CCS technologies’.

<sup>179</sup> An independent European observer notes that the Chinese side has preferred to deal separately with Member States pursuing their own narrow interests. See *The EU-China Partnership on Climate Change*.

relevant companies by the EU might help to fulfil these aims also deserves consideration.

The shift towards a 'green' economy is also a major goal of *EU 2020*. However, it is clear that the EU's interpretation of this term goes beyond the 'recycling' envisaged under China's 12FYP. In any case, the potential for technology transfer from the EU to China may be more limited than might have been expected: China is already among the world leaders both in solar technology and production and in the design and manufacture of wind turbines. The scope for engagement is more likely to lie in the direction of ongoing dialogue on the ways and means of achieving a 'green' economy. The fact that both the EU (and its Member States) and China face so many unknowns in terms of the implications of such a transition for labour markets, capacity-building and governance issues reinforces this conclusion.

On other dimensions of environmental policy too, the EU has identified a range of objectives towards which most Member States have been proceeding for some time. The EU and its Member States are committed to action designed to generate a cleaner, 'greener' environment, and share common ground with China on many matters of concern. Among them are the pollution of water and soil by hazardous substances, the protection of endangered species and the preservation of bio-diversity. On these matters, many Member States have already been engaged with China for some years in projects of joint research with direct practical application.

In sum, every one of the environmental issues that China faces, and that are subsumed in the sustainability objectives of the 12FYP, offers scope for constructive collaboration – and potentially for profitable business – between the EU/EU Member States and China. The concerns expressed in the Programme are those on which China is already focused as major priorities. Whether or not stated targets are fulfilled within the time frame of the Programme is, in the end, immaterial. The objectives put forward there are likely to continue into the next five-year planning period, and certainly through the time frame of the EU's 2020 Programme.

## 12 Conclusion

There are major reasons why Europe should seek to maintain strong ties with China over a broad range of activities. They include the following:

- China has more than one-fifth of the global population;
- for the past three decades, it has achieved the fastest GDP growth of any major economy in the world;
- during the past three decades, China has come to engage with the global economy on a scale that is unprecedented in its history;
- in the twenty-first century, it will occupy a pre-eminent position in global international affairs; and
- major issues affecting the global community and its prospects for sustainable development (for example, those relating to resource use, health and environmental protection) will not be resolved without China's active participation.

These findings underline China's growing influence as a global player. And this influence derives from the success of a reform strategy that famously has possessed its own 'Chinese characteristics'. From this perspective, far from being an exemplar of the triumph of liberal democracy or market economics, China's experience in the past three decades has defined itself. The recent global financial crisis has no doubt underlined the wisdom, as seen from Beijing, of China following its own path while serving as a warning to Beijing of the essential fragility of Western development models. In engaging with China, the EU would do well always to keep in mind that the impetus for further reform will not come from outside China but from within. Beijing's *weltanschauung* will continue to reflect its own view of history, its own values and its own ranking of priorities; it will not be swayed by pressure from outside. Economic and social developments *within* China are likely to be more powerful catalysts for political change than pressure from EU negotiators, which their Chinese counterparts may interpret as coercion. Thus, bringing pressure to bear in areas, such as human rights, where the EU has little hope of achieving significant progress is more likely to jeopardise progress in those areas (social welfare, improvements in material living standards, resource conservation, climate change and environmental enhancement etc.) where its impact promises to be more positive.

A recurring theme in some Western media sources is the threat allegedly posed by China's rise. All too often, such arguments are grounded in a discourse that ignores the historical perceptions and experiences that have shaped Chinese leaders' views of the country's place in the world. For the purposes of this paper, what is important about these perceptions and experiences is (to state the obvious) that they are different from those of the EU.<sup>180</sup> It is incumbent on both parties, the EU/EU Member States and China, not to lose sight of such differences. If China's understanding of Europe remains 'shallow and ill-informed',<sup>181</sup> the reverse is hardly less so.<sup>182</sup>

With this in mind, we would suggest that arguments about a 'Chinese threat' should be viewed through Sinocentric and Eurocentric prisms. We should bear in mind too that China poses no military 'threat' to Europe. Nor is it an exporter of international terrorism. Its sphere of influence is primarily East and Southeast Asia – regions that the United States, the source of 'China threat' discourse, has regarded as part of its sphere of influence since the Second World War – where it seeks to protect its borders and to safeguard oil exploration projects in the South China Sea. It also aspires to develop a second line of defence through a naval presence in the Indian Ocean and potentially in the Pacific. But in neither case are European interests directly involved – something that promises to benefit the EU in its engagement with China.<sup>183</sup>

Europe is not the only region, nor are EU Member States the only countries, in the world that seeks to benefit from China's continued growth and its increasing engagement in the global community. In the coming years, the EU must face up to an increasingly competitive environment. The strength of

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<sup>180</sup> To what extent they differ from those of Member States is quite another matter, about which, given those countries' different historical perspectives, no useful general statement can be made.

<sup>181</sup> This was the phrase used by David Shambaugh in his written testimony to the House of Lords EU Committee. Professor Shambaugh's evidence can be read in House of Lords, European Union Committee, *Stars and Dragons: The EU and China*, vol. II: Evidence (London: The Stationery Office, 2010), pp. 306–12.

<sup>182</sup> As a leading European scholar of China wrote in 2008, 'The gap in knowledge and understanding between the two [China and Europe] is still very great. ...[F]ew Europeans would be able to name a single Chinese author of fiction or a Chinese painter. ... [A]part from a few specialist scholars, probably not a single European could claim knowledge of the intellectual debates that have been conducted in China since the Tiananmen tragedy of 1989. China remains remote to most Europeans.' See Michael Yahuda, 'The Sino-European encounter: historical influences on contemporary relations', in David Shambaugh, Eberhard Sandschneider and Zhou Hong (eds), *China-Europe Relations: Perceptions, Policies and Prospects* (London and New York: Routledge, 2008), p. 30.

<sup>183</sup> See also *Ibid.*, p. 29.

competitive forces outside China can be taken as a given. In addition, however, there are many areas in which Europe must expect to face growing competition from *within* China. Just how seriously such challenges need to be taken is suggested in a recent EIU report, which lists three tipping points that will be reached in the very near future:<sup>184</sup>

- China's ascent of the value-added ladder will see its domestic export producers emerge as serious competitors in 'core product markets' of developed countries;<sup>185</sup>
- By 2012, non-OECD countries will probably have become the main source of demand for China's exports, further eroding the export market shares of Western, including EU, countries;
- The formerly dominant role of foreign-funded firms in driving China's export growth will give way to domestic Chinese enterprises.<sup>186</sup>

The scenario depicted here captures important dimensions of change that are under way in China. However, we would counsel caution in assessing the likely pace of China's ascent of the value-added ladder. Fundamental to this process – let alone to that of developing global production systems – is rapid technological advance. As this paper has shown, upgrading STI is one of the core priorities of the 12FYP (see 10.2.1). But transforming China into an 'innovative country' is not something that can be accomplished within a single FYP period. It is an inherently long-term undertaking, which will require massive R&D investment. It is a salutary reminder of how far China has yet to progress, if it is to take its place in the first rank of technologically advanced countries, to find that in 2010 its R&D spending (c.US\$105.8 billion, or c.Euro 80 billion) was only 20 per cent higher than the previous year's combined R&D spending of the top five global *firms* in each of just five industrial categories (aerospace, electronics and electrical equipment, pharmaceuticals and biotechnology,

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<sup>184</sup> Economist Intelligence Unit (EIU), 'Heavy Duty: China's Next Wave of Exports', 30 August 2011.

<sup>185</sup> The EIU report argues that heavy-equipment manufacturers will take the lead in this process. It points out that since 2001, China's market share of global exports of construction equipment has already risen from 2.3 per cent to more than 10 per cent.

<sup>186</sup> The EIU report notes that in 2011, domestic enterprises will account for more than half of all Chinese exports. In 2010, the corresponding figure was 48 per cent.



software and computers, and technology hardware and equipment).<sup>187</sup> The EU report is correct to state that foreign-funded firms' contribution to exports is declining. However, they remain dominant in China's high-tech sector: for example, they still account for around 90 per cent of exports of high-technology goods. Foreign-invested enterprises also account for more than one-third of all employment of high-tech workers and for around 40 per cent of scientists and engineers.<sup>188</sup> In short, the process of China's technological catch-up is set to continue for many more years, during which the potential contribution of European companies, as well as multinational companies elsewhere in the world, promises to be no less significant than in the past.

China's Twelfth Five-Year Programme sets out authoritatively and comprehensively the thinking of China's leadership about its national development trajectory in the foreseeable future. For the EU and EU Member States, the Programme provides clear signposts to the opportunities that will be available for engagement.

It would be wholly misleading to view the 12FYP simply as a propaganda exercise or a mere exercise in rhetoric. On the contrary, the Programme document sets out a vision of China's future to which the leadership genuinely subscribes.<sup>189</sup> Nor should the strong continuities of policy that it shares with the Eleventh Five-Year Programme be interpreted as evidence of the document's triviality. Rather, they serve to highlight areas in which previous goals have not been fulfilled and emphasise consistency of purpose. The shift from an ethos of growth maximisation to one of development sustainability represented a change in mindset by the Fourth Generation of leaders under Hu Jintao and Wen Jiabao. It was a compelling response to serious systemic challenges, social

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<sup>187</sup> These are crude calculations, based on the GDP estimate for 2010 given in *Zhongguo tongji zhaiyao*, 2011, divided by the yuan-dollar exchange rate from the same source (*Ibid.*, pp. 20 and 66). Even so, they suggest the scale of the technological challenge facing China. Detailed R&D spending in 2009 by the top 1,050 global firms in 41 industrial categories is available from the UK government's Department of Business Innovation and Skills and can be downloaded in full at [http://webarchive.nationalarchives.gov.uk/20101208170217/http://www.innovation.gov.uk/rd\\_sc\\_oreboard/?p=31](http://webarchive.nationalarchives.gov.uk/20101208170217/http://www.innovation.gov.uk/rd_sc_oreboard/?p=31) (accessed on 7 September 2011). Of the 25 firms from the five industrial categories, just five had their headquarters in EU Member States: one Finnish firm; one French firm; and three German firms. Switzerland was the only other European country represented (with pharmaceutical firms).

<sup>188</sup> Edward S. Steinfeld, *Playing Our Game: Why China's Rise Doesn't Threaten the West* (Oxford: Oxford University Press, 2010), p. 161.

<sup>189</sup> This is not to overlook the fact that the 12FYP has been the subject of debate within the Chinese leadership, nor that parts of the Programme represent compromise between different interest groups.

and environmental as much as economic, that had emerged from more than two decades of reform. That logic has shaped the development strategy of both the 11FYP and the 12FYP. There is every likelihood that it will also be espoused by the Fifth Generation of Chinese leaders, which will take office in 2012.

This paper has highlighted a number of broad priority goals set out in the 12FYP. They include:

- reduced GDP growth targets, intended to accommodate a more sustainable pattern of economic and social development;
- a reduction in regional and sectoral inequalities in the distribution of income, wealth and opportunity;
- enhancement of capacity-building in key areas of high-tech manufacturing;
- intensified research and development in targeted enterprises; and
- pursuit of low-carbon and no-carbon energy solutions in order to mitigate climate change.

We believe that these policy goals are logical responses to some of the most pressing problems that China faces at its current stage of development. Many of these problems have their origins in the rapid growth and rising prosperity that have characterised China's development under reform, as well as in its emergence on the global stage. These factors have brought China closer to EU Member States, with which – in varying degrees, depending on its European comparator – it shares common aspirations and common problems. Thus, some of the 12FYP goals match those contained in the EC's own longer-term vision. The focus of *EU 2020* is the creation of a 'smart, sustainable and inclusive economy'. To this end, it is committed to expanding employment, promoting innovation, enhancing education and putting in place a more socially inclusive society. It also seeks to address issues, such as energy security and climate change, that transcend European boundaries. All these aspirations resonate with China's development ambitions, and are stimuli for dialogue and exchanges between China and the EU. As it happens, they also afford significant commercial opportunities for European companies.

Central to the analysis in this paper is the belief that the 12FYP document is a clear and coherent statement of Chinese policy goals. It not only represents the consensus view of senior Party and government leaders but is also the key point of reference for all lower-level officials and others engaged in the formulation

and implementation of economic and social policy. A minority of the targets set out in the Twelfth Five-Year Programme are binding, and their fulfilment (or otherwise) will determine the future career trajectories of many officials. Most targets are, however, aspirational. If any of them, binding or aspirational, are left unfulfilled at the end of the 12FYP period, they will doubtless be carried over into the next five-year planning cycle, lending durability to China's strategic vision.

From the perspective of the EU and its Member States, China's future economic and commercial trajectories, as projected in the Twelfth Five-Year Development Programme, offer important new opportunities. In recent years, Chinese delegations to the EU and its Member States have made clear their interest in learning more about European approaches to social insurance – health, pension and medicare provision. Enhancing social welfare is an important part of China's vision of sustainable development, and it features prominently among the goals of the 12FYP. Here is one area in which the EU should engage with China and assist in facilitating economic rebalancing through the reallocation of household resources from savings to spending.

Both sides have long recognised science and technology to be at the heart of bilateral cooperation. S&T collaboration will continue to play a central role in the relationship. In particular, S&T will play a critical role in determining the success of the 12FYP in promoting industrial upgrading through the rapid expansion of strategic emerging industries and in addressing urgent environmental and energy challenges. In this process, the EU and Member States are well placed to make an even more significant contribution than they have already.<sup>190</sup> No less important is the need for realism in recognising that deficiencies in IPR protection remain a serious problem and that China itself is seeking to become a 'strategic competitor in high-tech sectors'.<sup>191</sup>

Successful implementation of the proposals set out in the 12FYP will generate important changes in the spatial dimensions of the Chinese economy. Such changes will of course take place only gradually, and care is needed not to exaggerate their impact. There is no reason to suppose that the dominant

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<sup>190</sup> As Nicola Casarini commented in his written testimony to the House of Lords EU Committee, 'scientific and technological cooperation with Europe is highly strategic for the Chinese leadership in order to modernise, improve the country's competitiveness across all sectors, and deliver higher standards of living to the Chinese population.' House of Lords, European Union Committee, *Stars and Dragons*, vol. II, p. 245.

<sup>191</sup> *Ibid.*

economic role played by coastal regions and their great urban agglomerations (for example, the Lower Yangtze and Pearl River Delta regions) will not persist. However, the emergence of new regional growth nodes and urban centres of economic activity will be an important feature of economic change in coming years. As long as associated infrastructural (transport) and logistical (retail distribution) challenges can be overcome, new commercial opportunities will be forthcoming from these geographical changes.

With this in mind, we would strongly argue that the EU should give careful consideration to extending its physical presence in China. Specifically, the establishment of offices in new urban and regional growth nodes promises to increase its influence and to facilitate further engagement with China. As appropriate, Member States, whether individually or collectively, should also assess the potential benefits of a stronger presence in China.

One final point: implicit throughout this paper is an awareness of the unique nature of EU governance. As its own website points out, the EU is ‘not a federation [...] nor is it simply an organisation for co-operation between governments’. Grasping this has been a challenge for Chinese officials working on how best to deal with Europe. For the EU, it has been a constraint, limiting its ability to coordinate policy against the background of differing strengths and interests among Member States. In some cases, Beijing has been quite willing to exploit such differences in its own interests; in others, it has opted in favour of dealing bilaterally with individual Member States. In order to minimise the fallout from EU governance, it is incumbent on the EU and its Member States to act together consistently.

## 12.1 Recommendations

### 12.1.1 General

- **The EU faces a conceptual problem in its efforts to promote itself and its interests in China.** Its organisational status as an association of sovereign states is well understood by the Chinese Ministry of Foreign Affairs and at the strategic level in some other organs of the Chinese government. But at the operational level, this is by no means the case. Some see this as a major barrier to effective cooperation and mutual engagement. **In presenting the EU to China for purposes of cooperation, it is therefore suggested that this apparent disadvantage should be made an advantage through the use of a phrase such as ‘shared values,**

**diverse approaches’.** This would serve to emphasise the multiplicity of solutions on offer from the EU in response to problems and challenges that, as Beijing itself acknowledges, are pressing issues for both sides.

### 12.1.2 International relations, with particular reference to the EU

China’s increasingly important role in the global economy is changing the rules of the game and reducing Europe’s ability to set and shape the agenda. **Proactive dialogue is needed, with particular attention to the role of the G20.** The EU should also engage in internal consultations in order to identify common positions as much as possible.

### 12.1.3 The regional perspective: the 12 FYP and China’s changing economic geography

- The next five years are likely to see the emergence of new nodes of growth in inland China. **The EU should consider ways of expanding its geographical presence and reach in China and should work with the Chinese government to identify new opportunities for engagement in less familiar locations.** An EU-China programme focused on central and western China would be one way of achieving this.
- **Mechanisms should also be put in place to ensure that information about such opportunities is made common knowledge in all Member States and is shared with relevant EU companies and/or other bodies.**
- Accelerated urbanisation will offer new commercial opportunities to European companies. **Efforts should therefore be made to strengthen policy exchanges relating to common challenges of urban living such as environmental protection, water and air quality, transport infrastructure and cultural industries, all of which are areas in which the EU has substantial expertise.**<sup>192</sup> This could be integrated as a major theme into high-level dialogue.

### 12.1.4 The 12FYP: commercial opportunities

- The 12FYP seeks to give equal emphasis to exports and imports and to achieve a balance between FDI and ODI. **In response to this, the EU needs to think about commercial opportunities in China in a new way,**

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<sup>192</sup> The Institute for Urban and Environmental Studies (Chinese Academy of Social Sciences) would be an excellent institution with which to begin such an engagement.

**no longer regarding it merely as an outlet for exports and a destination for FDI.** High-level speeches or interviews in the EU should be used proactively in order to help EU companies understand the implications of China's probable development path.

- **In particular, consideration needs to be given to the likely rise of Chinese ODI.** This should be an item for senior-level discussion within the EU so as to ascertain the extent to which common EU approaches are feasible. A mechanism within the EU for reporting policies and progress on Chinese inward investment would be a useful basis for such discussion.
- **Channels for the dissemination of practical advice to European companies should be strengthened. Such advice should include the fruits of research and analysis of new commercial opportunities and challenges for businesses in critical sectors of the EU economy.** This can be done by using existing channels more, such as Chambers of Commerce, including the EU Chamber network in China. But it needs to happen in Europe as well as among those companies already in China.
- **Practical support should be extended to European companies seeking to establish themselves in unfamiliar regions of China.** Consideration should be given to the establishment of EU-supported trade offices and the establishment of a platform for Member States to opt in to a coordinated EU approach to trade and investment promotion. But some Member States are likely to want to continue to engage bilaterally.
- **Through continued high-level dialogue, the EU should press the Chinese government on issues of concern to European companies. Such a dialogue must proceed on the basis of reciprocity, including a willingness to respond to Chinese claims of EU 'protectionism'.** The EU might consider whether or not 'Track II' engagement with Chinese experts might be useful in building consensus away from the political pressure of high-level dialogues.

#### **12.1.5 Education**

- **On the basis of initiatives that have already been taken, the EU should take advantage of the considerable scope that exists for dialogue and exchanges on governance issues in education.**

- There is still strong Chinese interest in both Master's degrees and PhD programmes offered at universities in the EU. **Efforts should be strengthened to recruit Chinese students for postgraduate study in EU Member States, especially in all aspects of science and technology, business studies and international relations and in niche areas such as environmental studies.** These are areas in which European institutions excel, and this should be reflected in carefully targeted postgraduate recruitment activity in China. The governments of EU Member States should structure their visa procedures so as to actively encourage postgraduate recruitment.
- Issues of language, culture, lack of familiarity with China's university system and scepticism among potential employers in EU Member States about the value of Chinese postgraduate degrees have made European students reluctant to undertake study in Chinese universities. **The EU needs urgently to examine ways in which more European students might be persuaded to undertake postgraduate study in China.** In particular, EU Member States should give much greater prominence to teaching the Chinese language in secondary schools and to measures to encourage the teaching of Chinese history, politics and business practice at the undergraduate level in European universities.

### 12.1.6 Science, technology and innovation

- **It is recommended that, wherever possible, EU Member States should undertake projects jointly with China rather than from what might be interpreted as an adversarial posture. This applies to research projects and those related to the commercialisation of technology.** Where Member States may wish to set limitations, as with military or dual-use technology, these should be made clear as diplomatically as possible. Priority areas for cooperation should be those in which Europe has an established reputation for excellence and in which a mutually agreed framework for cooperation can be achieved. Cooperation may include co-production in China and in Europe.
- **It is recommended that an ongoing dialogue on governance issues and capacity-building relating to innovation should be set up between the EU and relevant ministries and organisations in China. In addition to senior officials, it should involve those engaged at the operational level from both sides.** The aim of this exercise would be to share experience,

to enable each side to gain a better understanding of the other side's practices and to explore the scope for cooperation on major projects of mutual commercial benefit. Such a dialogue might embrace not only science and technology but also the entire infrastructural framework of innovation, including educational, legal and financial aspects. As indicated in the main text of this report, a first step would be an exchange of views on what may be differing ideas about the meaning of innovation.

- Following the visit to China in 2010 by two experts from the Strategic Forum for International Science and Technology Cooperation (SFIC), a report ('Approaching China: Background Report on Steps towards Developing Strategies for Science and Technology Cooperation with China') was published. It is recommended that the EU should re-examine this report and reconsider the possibility of acting on recommendations that have not yet been implemented. Action should include:
  - Clarification of progress towards establishing a strategy framework for S&T relations with China;
  - Creation of an 'S&T platform' in Beijing;
  - Further study of how to promote the mobility of scientific researchers, especially from the EU to China;
  - Progress towards the creation of a 'Research and Innovation Framework in the Development of Green Technologies to Mitigate Climate Change in China' (referred to in the 'Approaching China' document);
  - Implementation of clear and regular procedures to monitor developments on intellectual property rights;
  - Progress towards more effective coordination among Member States of instruments used in funding research with China; and
  - Clarification of progress on the establishment of a network of China-focused think tanks in Europe.

(For more information on the content of the SFIC's 'Approaching China' report and the extent to which progress has been achieved, see Section 10.3.2 of the paper.)

- **In particular, the recommendation in the 'Approaching China' report that an EU science centre should be set up in Beijing ought to be given further consideration.** High-tech EU multinational corporations might be



invited to help fund such a facility, which would offer visible evidence of the EU's commitment to scientific engagement with China.

- **In order to promote European business interests and to enhance the EU's reputation as a provider of, and partner in, high technology, EU commercial bodies should consider setting up loose industry-based consortia of EU companies in a given area of technology, specifically to monitor Chinese priorities and requirements in respect to that technology.** Such consortia might embrace companies within a single Member State or across several Member States.
- The FP7, now open to participation by Chinese researchers, is likely to remain the major instrument for EU funding of collaborative research between European and Chinese scientists. **Efforts should be made to simplify application procedures in order to raise the level of participation. Also, greater publicity ought to be given to opportunities for European SMEs to join with research institutes in making applications within the framework of the FP7.**
- The EU's Science and Technology Fellowship Programme (STF China) is critical to strengthening contacts between European and Chinese scientists. **It is strongly recommended that, as a matter of urgency, funding support for STF China should be renewed in order to ensure that the call for applications is uninterrupted. It is also recommended that the Programme should be continued for a period of at least 10 years so as to ensure parity with a similar programme conducted between the EU and Japan.**
- Bilateral projects of collaboration in scientific research between scientists in EU Member States and China are numerous and take many forms. **It is recommended that information about these bilateral projects should be systematically compiled and be made available in order to raise the visibility in China of EU scientific activity.**
- **Interlocutors from the Chinese Ministry of Science and Technology, the Chinese Academy of Sciences and the Natural Science Foundation of China should be invited to take part, on a regular basis, in meetings of EU science counsellors in Beijing.** The presence of such representatives would help to secure detailed knowledge of current Chinese priorities and concerns in science and technology and enable EU scientists to make the best use of their expertise in the Chinese context. Such knowledge

and the opportunities arising from it should be notified by counsellors to relevant science bodies in EU Member States.

- **It is recommended that efforts to publicise the collective EU S&T endeavour vis-à-vis China should be given priority so as to dispel the perception of some Chinese interlocutors that the EU punches below its weight in terms of scientific activity in China.** All Member State representatives who were interviewed for this ECRAN paper felt that the visibility of the EU in this area could be improved.

#### **12.1.7 Issues of sustainability: energy and the environment**

- **It is recommended that EU and EU Member State initiatives relating to greenhouse gas emissions and climate change should be encouraged and further developed. Such initiatives should include joint research into clean coal and other low-carbon energy solutions, exchanges on wind and wave power, the establishment of joint laboratories, the funding of institutes to promote research into all forms of renewable energy and commercial projects of technology transfer and consultancy.**
- China may continue to set its own targets for emissions reductions while remaining unwilling to accept externally imposed targets. **It is therefore recommended that the EU should continue to hold discussions with China on international arrangements for carbon reduction.**
- **EU companies in possession of advanced environmental technology should be encouraged to monitor closely developments arising from the 12FYP in order to be ready to respond to opportunities for technology transfer and commercially orientated collaboration.** Ideally, this could be achieved through a loose consortium of European companies that would meet periodically to share information about environmental developments in China, many of which are interrelated. Despite the obvious drawback that European companies are in competition with one another, this can be and has been made to work in other sectors.

## Annex A The Language of Planning in China

Chinese term	English translation	Explanation
Jihua	Plan	All China's FYPs from 1FYP (1953–57) to 10FYP (2001–05) were described as <i>jihua</i> . The term carries all the luggage of central planning, with its emphasis on the setting of physical production quotas, central allocation of resources etc.
Guihua	Guideline programme	China's 11FYP (2006–10) and 12FYP (2011–16) are called <i>guihua</i> . A <i>guihua</i> differs from a <i>jihua</i> in both scope and intent. It suggests a shift from planning by direct fiat towards planning that is more open, more consultative and more pluralistic. It also implies a diminution in the importance of quantitative targets in favour of qualitative objectives (e.g. more equal income distribution). A <i>guihua</i> sets out broad principles and overarching themes (e.g. both the 11FYP and the 12FYP highlight the importance of implementing a 'concept of scientific development' and establishing 'social harmony').
Yueshuxing	Obligatory or binding	Targets that are 'obligatory' are supposedly underpinned by the force of law and must be fulfilled. They carry an implicit expectation that local governments will formulate and implement appropriate policies to guarantee target fulfilment. The 11FYP contained eight obligatory targets, half of which were environmental. The 12FYP contains 12 such targets (seven environmental, three related to social welfare insurance). In practice, some binding targets are enforced more strictly than others. The degree of fulfilment of priority obligatory targets has become an important determinant of local officials' promotion prospects.
Yuqixing	Expected or predictive	Targets that are 'expected' are established in order to help guide policy formulation by local authorities. Although they are not binding, the expectation is that local officials will seek to establish 'favourable conditions' in order to assist in their fulfilment. The 11FYP contained 14 predictive targets. The 12FYP contains 12 such targets.
Jianyi	Proposal	At its plenary session in the autumn immediately preceding the year in which the FYP is due to begin, the Central Committee of the Chinese Communist Party examines a consultative draft FYP. The published version of this document is the basis for a final round of discussion, from which emerges the Programme that is subsequently placed before the National People's Congress for final endorsement.
Gangyao	Outline	The 'Outline' FYP is a more extended version of its parent 'Proposal' (the 12FYP Proposal has 48 pages; the 12FYP Outline runs to 150 pages). It describes strategic priorities for economic and social development, sets out the broad policy agenda and articulates specific predictive and binding targets. This is the document that is generally referred to as China's 'five-year programme [plan]'.

## Annex B Provincial Levels of Household Consumption Spending, 2009

Province	Household consumption (yuan)	Index of household consumption (National average = 100)
Tibet	4,060	44.6
Guizhou	5,044	55.4
Gansu	5,284	58.1
Yunnan	5,926	65.1
Xinjiang	5,990	65.8
Jiangxi	6,229	68.5
Qinghai	6,495	71.4
Henan	6,607	72.6
Hainan	6,695	73.6
Anhui	6,829	75.1
Shanxi	6,854	75.3
Sichuan	6,863	75.4
Guangxi	6,893	75.8
Shaanxi	7,069	77.7
Hebei	7,193	79.1
Heilongjiang	7,737	81.0
Hubei	7,791	85.6
Ningxia	7,858	86.4
Hunan	7,929	87.2
Chongqing	8,308	91.3
Jilin	8,410	92.4
<b>National Average</b>	<b>9,098</b>	<b>100.0</b>
Inner Mongolia	9,668	106.3
Shandong	10,494	115.3
Liaoning	10,848	119.2
Fujian	10,950	120.4
Jiangsu	11,993	131.8
Tianjin	15,149	166.5
Guangdong	15,291	168.1
Zhejiang	15,790	173.6
Beijing	22,154	243.5
Shanghai	29,752	327.0

Source: NBS, *Zhongguo tongji nianjian* [China Statistical Yearbook] (Beijing: Tongji chubanshe, 2010), pp. 61–62.

## Annex C THE 12FYP on Hong Kong and Macao

Chapter 57 of the 12FYP addresses the Hong Kong and Macao special administrative regions as part of a longer section on building the Chinese homeland, including Taiwan. The Hong Kong government in particular has made much of the importance of this chapter and its significance for Hong Kong. Reflecting the two SARs' high degree of autonomy, the Programme refers to the central government's (Beijing's) commitment to 'support' the SARs' comparative advantages rather than to provide 'guidance', which would have implied more active involvement. However, it seems clear from the Programme document – see, for example, the list of planned cooperation projects between Guangdong, Hong Kong and Macao – that further economic integration between the two SARs and the Mainland will characterise the 12FYP period. For Macao, the key strategic initiative is captured in plans for further economic diversification.

Perhaps most significant of all is Hong Kong's role as China's offshore financial centre. This is envisaged in the 12FYP in the reference to the part it is expected to play in the RMB's internationalisation and as an asset management centre. In addition, the Programme urges that Hong Kong's existing key strengths in finance, shipping and logistics, tourism and professional services should be maintained while also committing the central government to supporting newer strategic industries, such as environment and education. Chapter 48 of the 12FYP (on the financial system) also refers briefly to 'expanding cross-border use of the RMB'<sup>a</sup> and to 'greater capital account convertibility'. (This issue is not addressed in chapters 50–53 on trade and investment, analysed in Section 8.) The low-key nature of these references underplays the likely importance to China of such issues during the next five years.

By virtue of its history and economic (for example, tax) advantages,<sup>b</sup> Hong Kong remains a favourable location from which EU companies, especially SMEs, can explore opportunities in China. But as China's economy continues to grow and the number of dynamic regions and cities in the country increases, Hong Kong will not be the only location through which EU companies are able to access China, and its role will depend on the sector in which a particular company operating, its scale of operations and its market potential etc. Thus, EU institutions responsible for supporting trade and investment need to be positioned to help EU companies understand the benefits that Hong Kong can offer.

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<sup>a</sup> The geographical spread of trade settlement agreements (Hong Kong, South Korea, Malaysia, Indonesia, Singapore, Iceland, Belarus and Argentina) supports the argument that the aim is the internationalisation of the RMB (initially with other emerging economies), not just its greater use in China's neighbouring Asian regions.

<sup>b</sup> Such advantages help to explain why Hong Kong remains the largest source of FDI into China, officially accounting for more than 60 per cent of inflows in 2010.

## Annex D 12FYP Headline Content on Energy

### Energy efficiency

[Chapter 11, 'Give Impetus to the Way Energy is Produced and Used']

#### *Promoting and using diversified and clean energy sources*

Priorities include the reorganisation of the coal industry, including shutting down small and dangerous mines; the development of coal-based natural gas and conventional and unconventional oil and natural gas resources; the expansion of hydropower, nuclear, wind, solar, geothermal and other new energy sources.

#### *Optimising the layout of energy development*

The 12FYP calls for the creation of five 'national comprehensive energy bases' and the expansion of nuclear power in eastern coastal China and parts of central China and for improvements in energy storage facilities.

#### *Strengthening construction of energy transmission channels*

The domestic network of oil and gas pipelines and long-distance transmission facilities will be improved. New forms of energy will be connected to the grid. Energy supplies will be made more reliable.

[Chapter 22, 'Strengthen Resource Conservation and Management']

#### *Strengthening energy conservation management*

The 12FYP specifies new targets designed to reduce energy consumption per unit of GDP and to check the excessive growth of energy-intensive industries. Energy-efficiency standards are to be introduced for energy-consuming products. Energy savings are to be imposed on investment projects.

#### *Enforcement of energy conservation*

The 12FYP calls for the promotion of energy-saving conversion projects and for the encouragement of industrial projects based on energy-saving technologies.

### Low-carbon development strategy

The low-carbon development strategy is an integral part of China's energy plans for 2011–15, but is also designed to assist in environmental protection efforts. Its priorities include:

[Chapter 2, 'Guiding Principles']

Commitment to development of a circular economy and low-carbon technologies.

[Chapter 9, 'Transform and Upgrade Manufacturing Industry']

Commitment to implement exemplary projects of carbon dioxide utilisation in the petrochemical industry.

[Chapter 22, 'Strengthen Resource Conservation Management' and Chapter 23, 'Vigorously Develop a Circular Economy']

*Control of greenhouse gas emissions*

Here the emphasis is on saving energy, improving energy efficiency and increasing forest carbon sinks. The carbon intensity of energy consumption will be reduced, low-carbon technologies will be developed and implemented and a system for more accurately calculating GHG emissions will be devised. China will also seek to create a carbon emissions trading system. Major industrial enterprises will be encouraged to promote low-carbon energy-saving operations. Through the development of a 'circular' economy, the Programme seeks to encourage low-carbon consumption models and lifestyles by government and throughout society.

## **Energy security**

[Chapter 1, 'The Development Environment' and Chapter 52, 'Integrate "Bringing In" with "Going Global"']

Adequate supplies of energy are essential to China's continued growth. The strategic importance of energy security is implicit in all the energy targets in the 12FYP. In addition, specific reference is made [Chapter 1] to the important place of energy security among major global issues and [Chapter 52] to China's determination 'to deepen mutually beneficial international co-operation on the exploitation and processing of energy resources'.<sup>a</sup>

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<sup>a</sup> CDTD, Twelfth Five-Year Plan, p. 214 and Gangyao, p. 134.

## Annex E 12FYP Headline Content on Environmental Issues

### Climate change

The headline intentions for climate change are primarily in chapters 21 and 61, but other relevant information is in chapters 22–26.

[Chapter 21, ‘Actively Respond to Global Climate Change’]

#### **Controlling greenhouse gas emissions**

The key policy is to ‘comprehensively utilise various methods, including adjusting the industrial and energy structure, conserving energy and raising efficiency, and increasing forest carbon sinks to [...] reduce resource consumption and carbon dioxide emissions and [...] control emissions of GHGs’.<sup>a</sup> The regulation and reduction of GHGs through reduced energy consumption, the reduced carbon intensity of the energy consumed, forestation programmes and the research, development and application of low-carbon technologies will, it is believed, help to slow down the process of climate change. Implicit in this approach is a recognition that extensive inputs of new technology will be required in order to reduce the carbon intensity of energy use by industrial and domestic consumers.

#### **Enhancing China’s capacity to adapt to climate change**

A recognition of potential climate change impacts will be the basis for the formulation of all new industrial and infrastructural projects. The capacity to accommodate such impacts will be built into all new developments, including those in agriculture, forestry, water management, and adaptability to climate change will be strengthened in coastal regions and areas with fragile ecosystems. Much enhanced research into climate change will underpin this effort.

#### **International cooperation**

The 12FYP commits China to ‘actively participate in international negotiations and promote the establishment of a just and equitable international system for responding to climate change’.<sup>b</sup> In line with this

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<sup>a</sup> CDTD, *Twelfth Five-Year Plan*, p. 97 and *Gangyao*, pp. 62–63.

<sup>b</sup> CDTD, *Twelfth Five-Year Plan*, p. 98 and *Gangyao*, p. 63. Note, however, that the commitment to international engagement is premised on ‘the principle of common but differentiated responsibility’ (*Gangyao*, *ibid.*).



intention, China will continue to collaborate in research and capacity-building on climate change.

[Chapter 61, 'Improve the Mechanism for Plan Implementation and Evaluation']

There is specific reference here to the need to improve the statistical work related to energy conservation, emissions reduction and climate change.

### **Creation of a 'green' economy**

[Chapter 23, 'Vigorously Develop a Circular Economy']

#### **Implementing circular resource use and production methods**

The 12FYP seeks to promote the adoption of 'clean' production methods by recourse to recycling industrial, agricultural and construction waste (there is a target to use 72 per cent of industrial waste by 2015), water and processing pollutants. Efforts will also be made to renovate existing and to construct new industrial parks. Another target is to increase the resource-output ratio by 15 per cent.

#### **Popularising 'green' consumption**

The Programme advocates a 'green' lifestyle and consumption pattern 'compatible with China's national conditions' by encouraging consumers to buy low-carbon, energy-saving, water-saving and recycled goods (including environmentally friendly cars and housing that is less energy- and land-intensive) and to avoid purchasing disposable products. Restrictions will be introduced on 'excessive' packaging, and government departments will be required to adopt 'green' procurement methods. 'Irrational' consumption will be curbed.

#### **Policy and technical support**

Financial and fiscal planning and legislation must take account of environmental objectives and standards. A tracking system will be introduced to monitor producers' success in meeting their responsibilities. Monitoring the shift towards a circular economy will take place through statistical evaluations and other forms of assessment. Technology will be developed and applied so as to facilitate remanufacturing, recycling, zero-emission and reduced resource use throughout production processes. Circular economy pilot projects will be implemented in Gansu and Qinghai

provinces, and Shanxi will host a ‘comprehensive co-ordinated reform test area [...] for the movement away from a resource-based economy’.<sup>c</sup>

[Chapter 49, ‘Deepen Reform of the Prices for Resource Products and Environmental Protection Charges’]

### **Measures for setting the prices of resource products**

The 12FYP seeks to put in place effective and flexible mechanisms to establish resource product prices at levels that reflect market supply and demand, resource scarcity and the potential cost of environmental damage. The reform of prices for water and electricity will continue and, in particular, tiered prices will be introduced for the household consumption of both. The price ratio of natural gas to alternative sources of energy will be rationalised. Taxes on resource use will be raised.

### **Environmental protection charges**

Intensified efforts will be made to ensure that polluters pay for pollution damage, and charges for the discharge of pollutants will be raised. Taxes and fees for environmental protection will be reformed.

### **Resources and environmental property rights**

Market mechanisms will be the preferred means of establishing an effective and standardised trading system, backed up by appropriate legislation, for mining industry rights and emission rights.

## **Other aspects of the environment**

[Chapter 24, ‘Intensify Environmental Protection’]

The main thrust of this chapter is to address public health-related environmental issues, such as air and soil contamination and the provision of safe drinking water.

### **Reducing and controlling emissions**

The 12FYP commits itself to more effectively controlling emissions of major pollutants, especially in targeted industries (paper making, dyeing, chemical engineering, leather and large-scale livestock and poultry breeding), and to tackling SO<sub>2</sub> (sulphur dioxide) and NO<sub>x</sub> (nitrogen oxide) emissions from coal-fired power generation, from the iron and steel, chemical and non-ferrous industries and from construction materials. Controls on vehicle exhaust

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<sup>c</sup> CDTD, *Twelfth Five-Year Plan*, p. 106 and *Gangyao*, p. 68.

emissions and other sources of pollution will also be strengthened. Stated targets include achieving above-Grade II air quality in 80 per cent of cities at and above prefecture level and treating 85 per cent of urban sewage.

### **Protecting against environmental risks**

Intensified efforts are called for to deal with persistent organic pollutants, hazardous waste and chemicals. Controls on heavy metal pollution (especially in the Xiangjiang River basin) will be strengthened; so will the monitoring of nuclear waste and radiation. Monitoring and risk assessment capabilities will also be improved.

### **Environmental supervision**

Environmental protection laws will be tightened and regulations and standards will be enhanced. Environmental impact assessment will be stringently applied. New systems will track responsibility for environmental accidents and pollution damage.

[Chapter 25, 'Promote Ecological Protection and Remediation']

### **Ecological safety barriers**

Key 'national ecological function areas' will be established, and a 'strategic ecological safety' framework will be put in place to prohibit development in designated protected areas. Special attention will be paid to the Qinghai-Tibet Plateau eco-barrier, the Loess Plateau-Sichuan and Yunnan eco-barriers, the north-east China forest belt, the north China sand prevention zone, the south China hills and mountainous areas and major rivers.

### **Strengthening ecological protection and management**

Natural forests and grasslands will be protected and restored, and measures will be taken to combat desertification and soil erosion. Rivers, lakes and wetlands will be protected. Measures to preserve and maintain endangered species will be implemented and bio-safety measures will be strengthened.

### **Compensation measures**

An ecological compensation mechanism will be introduced, based on the principle that developers should be required to protect ecological systems and should compensate for any damage they cause. A sustainable development reserve fund will be set up by resource-consuming enterprises. Market mechanisms will be explored in formulating and implementing compensation arrangements.

[Chapter 26, 'Intensify the Development of Systems for Water Conservancy and Disaster Prevention and Mitigation']

**Improve water supply capabilities**

Intensified efforts will be made to improve water diversion systems from south to north and from east to west, as well as between rivers and reservoirs. A stated target is to increase the annual water supply capacity by 40 billion m<sup>3</sup> by building new 'water source projects', especially small and medium projects, and by improving both water conservancy and transfer infrastructure and management.

**Flood control**

The management of major river systems and lakes, including the Yangtze and Yellow rivers and Dongting and Poyang lakes, will be strengthened through capacity-building. Dykes will be built and other flood control measures will be taken for small and medium-sized rivers and lakes. Damaged, neglected and dilapidated reservoirs will be repaired and new sea dykes will be built.

**Extreme weather, earthquakes and natural disasters**

The emphasis here is on the prevention and control of meteorological and natural disasters. Monitoring, early warning and prevention systems will be put in place





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