



**Universities UK  
International**

# **INFORMATION NOTE – 2016 CHINA ACTIVITIES IN REVIEW**

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**Action:**

For information

**Audience:**

Pro-Vice-Chancellors International, Directors International and International Office staff with responsibility for China

**Executive Summary**

2016 was a significant year for domestic politics in China. In March the National People's Congress formally approved the 13<sup>th</sup> Five Year Plan.

The Plan sets out the national socio-economic priorities including those in higher education and research. This paper presents a summary and analysis of the implications of this Plan for UK universities. It also details current and expected funding and other developments relevant to UK/China collaboration in higher education and research. Finally, it reports on a series of high-profile engagements between the UK and China in higher education, culminating with the People-to-People Dialogue and accompanying Education Summit in Shanghai in December 2016.

# DOMESTIC POLITICAL DEVELOPMENTS

## The Thirteenth Five Year Plan

In March 2016 the National People's Congress (NPC) took place in Beijing. The NPC is officially the paramount organ of governance within China. It is composed of nearly 3,000 delegates from across China, including provincial and regional representatives, members of the armed forces as well as other participants such as ethnic and religious minority representatives and members of the eight democratic political parties that allied with the Chinese Communist Party in the civil war that preceded the emergence of the People's Republic of China in 1949. The formal functions of the National People's Congress include amendment of the constitution, enactment and amendment of laws and the setting of national policy directions.

The 2016 meeting of the NPC included the formal adoption of the Thirteenth Five Year Plan for Economic and Social Development of the People's Republic of China (2016-2020). This document sets out the national objectives for socio-economic development. With other policy documents such as the National Medium and Long-Term Program for Science and Technology Development (2006 – 2020) it provides a useful insight into the potential influence of state priorities upon the activities of Chinese academia, Government and industry over the next few years and by extension could help universities in the UK to position their own collaborative engagement.

### The Thirteenth Five Year Plan – Implications for Higher Education

An English translation of the Thirteenth Five Year Plan for Economic and Social Development of the People's Republic of China (2016-2020) in full is available to download from the Chinese Government's website<sup>1</sup>. An analysis of the translation, drawing out the main features which relate to higher education and research is included in Annex A. The following points are drawn from this analysis:

- The science, technology and education targets in the Twelfth Five Year Plan were met in most respects. The target for 2.2% GDP to be spent on research and development was missed by .1%.

Conversely the target for 3.3 patents per 10,000 people was exceeded by nearly 100%.

- The frontier technology research areas identified in the *National Medium and Long-Term Program for Science and Technology Development (2006 – 2020)* remain relevant.
- The Plan includes proposals for a number of high-profile capacity building initiatives in infrastructure, resource and training. These include plans to recruit overseas academics, develop regional hubs and integration of education and industry.
- The One Belt, One Road initiative is identified as a key mechanism for the economic development of China and participant countries. A number of associated education initiatives are proposed to support its success.

The broad focus of the Plan is upon innovation and consequently there are a number of further initiatives that are explicitly focused upon higher education. The World Class Universities initiative is one example that is already yielding opportunities for the UK sector, as it is through this scheme that the Provincial Governments of Guangdong and Jiangsu are supporting a call for collaboration with the UK. An Education Development Plan for the 13<sup>th</sup> Five-Year Plan<sup>2</sup> period has subsequently been released. Highlights identified in a British Council<sup>3</sup> analysis include:

- Increased targets for higher education enrolment. The Plan sets a new 50% goal for gross higher education enrolment by 2020... The total number of HE students (including higher vocational students) will increase from 36.5 to 38.5 million by 2020, while the number of postgraduates will increase to 2.9 million including 2.3 million full-time postgraduates.
- Plans to strengthen international exchange and cooperation. This includes strengthened systems surrounding Sino-foreign joint institutions. This includes improved systems for supervision, quality assurance and information sharing, as

well as improving the system for institutions exiting the market.

- Support for inward student mobility. A plan will be drawn up to both increase the scale and improve the quality of overseas students studying in China, while a 'Study in China' brand will be created. There is an aspiration to increase the number of overseas postgraduates to make up 3 per cent of total postgraduate enrolment by 2020, but no set targets for students at other levels.

### **Law on Administration of the Activities of Overseas Nongovernmental Organisations in the Mainland of China**

The Law on Administration of Activities of Overseas Nongovernmental Organisations in the Mainland of China (hereafter referred to as the Foreign NGO Law) was passed in April 2016 and came into force on Sunday 1 January 2017.

The Law has been a source of consternation to international organisations operating in China including universities as it appears to impose enhanced oversight and reporting requirements. This concern has been compounded by ambiguity as to the scope of application of the law. This is a consequence of the potential breadth of the definition of *nongovernmental organisation*, which could extend to include universities. In reflection of this, at the 2015 China-UK People-to-People Dialogue Jo Johnson MP, Minister of State for Universities and Science raised the concerns of the sector and sought clarification upon the scope of the Law's applicability. Following the raising of similar concerns by a range of international organisations, the position of the Law has been clarified to indicate that the activities of overseas academic organisations operating within China are not within scope when working with equivalent organisations. Nonetheless, there remains some scope for ambiguity and the practical advice for organisations that are uncertain is to speak with their Chinese partners to confirm whether or not their activities are within the scope of the Law.

This Law has been seen within the context of growing desire for control by the Chinese Communist Party of civil society, including universities. This is typically portrayed as ideologically driven and evidenced by the widely reported statements of then Minister for Education, Yuan Guiren, in 2015 calling for a rejection of western values in higher education<sup>4</sup> and more recently in December 2016, Premier Xi Jinping's urging that Party officials and university leaders 'build colleges into strongholds that adhere to Party leadership.'<sup>5</sup> This exists in parallel with a pragmatic

interest in continued international cooperation as a means to achieve further excellence in research performance and teaching methods. Consequently, it is unclear what the ultimate impact of this rhetoric shall be upon UK university engagement with China. Concerns have been raised in the past in the context of transnational education delivery by UK universities in China. These concerns have been framed by the Chinese Government in terms of quality and number rather than ideology. For example, with regard to the length of time visiting international faculty spend at partner institutions or concerning the number of joint degrees in courses such as Business & Management in a particular province.

From the UK perspective, the absence of accessible clear and consistent guidelines for transnational arrangements has proved a cause of frustration and a source of ambiguity. Ultimately, this uncertainty allows scope for interpretation in implementation and creates a potentially precarious operating environment. The British Council, Universities UK International and Quality Assurance Agency conducted some initial work with Chinese partners last year to provide greater clarity in this area. A follow-up workshop will take place in London on Monday 20 March to focus on operational issues in transnational education with China.

### **2017 Forward Look**

As the Thirteenth Five Year Plan is implemented it is reasonable to expect increased focus on universities as a driver of innovation, and new and continued demand for international collaboration in areas that support this.

# China-UK Government Engagement

## UK-China Research and Innovation Partnership Fund

In China the Newton Fund is known as the *UK-China Research and Innovation Partnership Fund*. China is the largest single country recipient of funding, receiving £23 million of match funded investment (£46 million total) in 2016–17 for activity in the following areas: creative economy, education, energy, environmental technologies, food and water security, health and urbanisation. Activities in 2016 included PhD placements, Researcher Links Workshops, an ESRC Sustainable Deltas call and a Science and Technology Facilities Council Agri-tech Newton Network+ and Proof of Concept Awards. Additionally, the Academies ran fellowships and mobility grants.

## Prosperity Fund

The new Cross-Government Prosperity Fund launched in 2016. It is part of the UK's commitment to contribute 0.7% of its Gross National Income to development assistance and amounts to £1.3 billion over the next five years. Further information about the fund is available on the UK Government website<sup>6</sup>.

In China the Cross-Government Prosperity Fund has six objectives<sup>7</sup>:

1. To improve the efficiency and sustainability of China's economic growth through financial sector reforms.
2. To improve the investment climate, and to facilitate the efficient allocation of domestic and cross-border investment in a sustainable, environmentally and socially responsible way.
3. To increase China's engagement on economic and trade policy co-ordination, to promote strong, balanced and sustainable economic growth for China and for the rest of the world.
4. To improve the sustainability of China's economic model through structural reforms.
5. To develop China's more active and transparent engagement on energy and resource management to build global energy security and to support a low carbon clean energy transition.
6. To drive a clean and low carbon transition, boost green growth and help prevent dangerous climate change.

Additionally, the British Council China administrated a dedicated resource for activity in Education. Proposals were invited in the summer of 2016 for projects to be delivered in the 2016–17 financial year. Projects

were invited in the following areas: creative industries, enterprise & entrepreneurship education, vocational education, executive leadership & management, and health education. 2016–17 is a formative year for the fund with the expectation that the outcomes of the pilot projects shall shape the activities of the programme until 2021. Further information is available from the British Council website<sup>8</sup>.

Five projects were ultimately selected for funding. They are completing activity in the development of vocational curriculum, graduate employability, apprenticeships, student enterprise, and the creative economy. Further calls for funding are expected early in the 2017–18 financial year.

## UK China Partners in Education

The UK China Partners in Education (UKCPIE) programme was established in 2011 with four main strands: building partnerships and promoting mobility in higher education; developing further education and skills training; raising school standards; and promoting Mandarin learning in UK and English in China. The programme was initially conceived as a three-year action plan, the original term ending in 2014. Activities contained within UKCPIE include the Study China outward student mobility programme. Within the UK the programme was funded and administered by the Department for Business, Innovation & Skills (BIS) though additional actors such as the Department for Education are involved in the delivery of its activities. A consultancy, Warwick Economics & Development was commissioned to undertake an evaluation of the UKCPIE during the period of 2011–2014. The output of which concluded that the programme, 'is strategically important for both the UK and Chinese Governments as it reflects both countries willingness and commitment for better mutual understanding of their economies, societies and culture...UKCPIE also provides the framework needed to ensure that specific educational programmes and projects are endorsed and thus can happen and enable many other education-related initiatives and agreements to take place.'<sup>9</sup> For each of the four strands outlined above there are agreed priority areas reflecting larger strategic priorities. The restatement of established national priorities partially defines the scope of preferred collaboration between both countries, and so, particularly crucially within China, provides the implementing civil servants with clear scope for the approval of projects. Consequently,

though the economic value of the UKCPIE may be relatively modest (in the single millions annually across all four strands) the partnership has had a larger significance as an enabling mechanism for a range of international collaboration.

An extension to the programme was agreed at the April 2014 Bilateral People-to-People Dialogue in Beijing through the *Framework for Strengthening UK-China Partnerships in Education*.

In September 2015 the Governments of the UK and China signed a framework agreement on education collaboration. The signing took place at the Education Summit within the People-to-People Dialogue. This extends the framework.

The higher education content of the framework reflects the output of a consultation of the Universities UK International Asia Network in 2015. In brief, the themes include collaboration with industry, entrepreneurialism, greater regional engagement, and research collaboration.

The framework agreement was signed between the Governments of both countries at Secretary of State level and managed by the Department for Business, Innovation and Skills. Following the bureaucratic restructure that took place in the UK after the EU referendum this has remained with the Department for Business, Energy & Industrial Strategy though the shape of the programme may still change.

In 2016 the UK China Partners in Education initiative supported activities in higher education including funding collaborative projects in employability, as well as a week of activities in Beijing in March focused on employability and entrepreneurship and transnational education (TNE). The work upon employability and entrepreneurship was largely exploratory in nature, looking at new opportunities for collaboration. In contrast, the discussion of transnational education provision was focused on enabling UK providers to respond to changing objectives within China and better understand the current regulation. Further work in both areas is expected in 2017.

In late 2016, a call was issued for funding for UK universities to collaborate with the Chinese Excellence League (E9) of Universities, a Government backed consortium of engineering universities. As with the earlier employability funding call and March activity, this call was funded through the UK China Partners in Education Fund and designed by the British Council China and Universities UK International.

### **Pujiang Innovation Forum**

In September 2016 Jo Johnson MP, Minister of State for Universities & Science led a delegation of

university representatives to participate in the Pujiang Innovation Forum.

The Forum generated significant media interest and the Minister's delegation included a number of announcements related to higher education cooperation. These include the signing of Memoranda of Understanding by Universities UK International and British Council China with the Excellence League of Universities (E9) and the Jiangsu Provincial Government. The outcome of these is the aforementioned funding call for collaboration with the E9 and a funding call for collaboration between UK universities and institutions in the Guangdong and Jiangsu provinces.

### **People-to-People Dialogue**

In December 2016 the People-to-People Dialogue took place between the UK and China in Shanghai. The People-to-People is a high-level diplomatic engagement concerned with all aspects of cultural collaboration. It is co-chaired by Vice-Premier Madam Liu Yandong and Secretary of State Jeremy Hunt. It includes a number of sector-specific working groups, including an Education Summit. This Summit discusses the whole range of education collaboration between the UK and China and agrees the high-level strategic direction of future engagement. This year's Education Summit was co-chaired by the Minister of Education, Chen Baosheng and Secretary of State for Education, the Rt. Hon Justine Greening MP. Vivienne Stern of Universities UK International represented the higher education sector. Key announcements included a Memorandum of Understanding on UK-China Research and Innovation between the Department for Business, Energy & Industrial Strategy and Ministry of Science and Technology, a Memorandum of Understanding on the UK-China Antimicrobial Resistance Research and Innovation Collaboration between the Department of Health of the UK and the Ministry of Science and Technology of China, and the agreement of an action plan for the UK-China Partners in Education Framework<sup>10</sup>.

### **2017 Forward Look**

Universities UK International shall continue to work with the British Council China and the Department for Business, Energy & Industrial Strategy upon the implementation of the UK China Partners in Education programme.

Immediate activities include the funding call to support UK universities in engaging with institutions in the provinces of Guangdong and Jiangsu as well as the workshop in London in March upon delivering TNE in China.

The ambition is to create further funding opportunities for collaboration through UKCPIE in the new financial year, with the expectation that this shall be to support collaboration in research, engagement with industry and clarifying the operational environment for transnational education.

# Annex A – Summary of the Thirteenth Five Year Plan for Economic and Social Development of the People’s Republic of China

This summary has been produced using the English translation of the Thirteenth Five Year Plan for Economic and Social Development of the People’s Republic of China, produced by the Central Compilation and Translation Press and available to download from the Chinese Government website at the following address: <http://en.ndrc.gov.cn/newsrelease/201612/P020161207645765233498.pdf>

This summary concentrates on those aspects of the Plan with relevance to higher education and research collaboration.

## Part I – Guiding thinking, major objectives and development philosophy

In sum, the objective of the Plan is to make China into a ‘moderately prosperous society’ by 2020. This accords with the Two Centenary Goals adopted in the Chinese constitution in 2012<sup>11</sup>. These are:

1. To finish building a moderately prosperous society in all respects by the time the CPC celebrates its centenary in 2021.
2. To turn the People’s Republic of China into a modern socialist country that is prosperous, strong, democratic, culturally advanced and harmonious by the time it celebrates its centenary in 2049.

**Moderately prosperous** is usually associated in international media commentary with becoming a high-income country as defined by the World Bank with GNI per capita of at least \$12,476<sup>12</sup>, thereby escaping the middle-income trap. Though within the Plan, the target is set as a doubling of China’s 2010 GDP and GDP per capita by 2020<sup>13</sup>. As the GDP per capita in current US \$ (at the time of writing) in 2010 was \$4,560.51<sup>14</sup>, this would equate to \$9,120.02 and so is likely to be met at current growth rates (GDP per capita was \$8,027.68 in 2015). Additionally, the Plan and associated Chinese Government commentary stresses the importance of other economic objectives and goals such as the notion of sustainable growth and inclusion. The Plan acknowledges the structural challenges to continued economic growth and highlights the need for reform as the economy matures. Innovation is identified as the primary driving force for development.

The Plan includes a table measuring performance against the objectives of the Twelfth Five Year Plan. Those for science, technology and education are included below:

## Science, technology and education

Indicator	Target		Fulfilment	
	2015	5-year average [5-year cumulative total]	2015	5-year average [5-year cumulative total]
Nine-year compulsory education completion rate (%)	93	n/a	93	n/a
Senior secondary education gross enrolment rate (%)	87	n/a	87	n/a
Research and development expenditure (% of GDP)	2.2	n/a	2.1	n/a
Patents per 10,000 people	3.3	n/a	6.3	n/a

## Part II – Innovation Driven Development

Having identified innovation as the primary cause of future growth, the Plan goes on to set out a number of measures to stimulate it. These are included in brief below:

- 1. Breakthroughs in strategic and frontier fields:** These are identified as *next generation information and communications, new energy, new materials, aeronautics and astronautics, biomedicine and smart manufacturing*. Further discussion of these is included below.
- 2. A better system for organising innovation:** This calls for the establishment of new *entities for innovation* as well as clarification of the roles and responsibilities of existing participants within the system. Particular measures include the implementation of the 100 Most Innovative Enterprises initiative and supporting *high quality universities and research institutes in building comprehensive, interdisciplinary research teams*.
- 3. Infrastructure for innovation:** The innovation capacity will be increased. While individual universities will house particular national technological innovation centres open sharing of infrastructure will be encouraged.
- 4. Regional innovation centres:** Regional development will be encouraged initially through major cities that already have a core of universities, research institutes and other relevant infrastructure. Beijing and Shanghai will be further developed as centres of international excellence.

Additionally, a number of particular programmes for science and technology innovation are listed. These are largely consistent with the frontier technology research areas identified in the National Medium and Long-Term Program for Science and Technology Development (2006 – 2020) albeit not necessarily in terms of particular sub-priorities identified in that document. A comparison is included in the table below.

National Medium and Long-Term Program for Science and Technology Development (2006 – 2020) Frontier Technology Areas	Programmes for Sci-Tech Innovation 2030 (from The Thirteenth Five Year Plan for Economic and Social Development of the People's Republic of China)	
	Programmes	Projects
Biotechnology	Brain-science and brain-inspired research	Seed industry innovation
Information technology	Quantum communications and computing National cyberspace security	Integrated space-terrestrial information networks Big data
Advanced materials technology		Key new materials research, development, and application
Advanced manufacturing technology		Smart manufacturing and robotics
Advanced energy technology		Clean and efficient coal use Smart grids
Marine technology	Deep-sea stations	
Lasers technology		
Aerospace technology	Aircraft engines and gas turbines Deep space explorations and in-orbit spacecraft servicing and maintenance systems	
		Environmental governance in the Beijing-Tianjin-Hebei region
		Healthcare

With regard to developing human resources to support innovation the Plan proposes the following initiatives<sup>15</sup>, many of which are focused upon higher education:

**1. Innovator training initiatives**

- Set up scientist studios for fields where China has competitive strengths, focusing particularly on supporting and training young and middle-aged leading scientific and technological innovators
- Build teams of innovators in key fields
- Make focused efforts to support innovators and entrepreneurs working in science and technology and establish centres for others to learn from them to foster innovative talent

**2. Young talent development initiatives**

- Train the very best young talent in key disciplines and support their research
- Establish national young talent training centres for outstanding college students at quality research universities and research institutes for basic disciplines where the strengths of the respective university or institute lie
- Select the best talent from new senior secondary school and college graduates every year to participate in advanced training at first-class universities outside China and keep track of their progress

**3. Quality improvement programmes for business executives**

- Train entrepreneurs who have a perspective on global needs, think strategically, and are innovative
- Train 10,000 business executives in strategic planning, capital operations, quality control, human resources management, finance, accounting, and law

**4. The Talent 1,000 Initiative and the Talent 10,000 Initiative**

- Attract science strategists and leading talent working in science and technology from overseas who have the capacity to engage in primary innovation, make breakthroughs in key technologies, develop high-tech industries, and drive the development of emerging disciplines
- Bring in approximately 10,000 high-calibre talented individuals from overseas to make innovations or start businesses
- Select from within China and offer support to approximately 10,000 urgently needed, highly talented individuals

**5. Knowledge refresher programmes for professional and technical personnel**

- Train one million high-calibre, urgently needed, and key professional and technical personnel each year
- Establish national continuing education centres, drawing on existing education institutions at universities, research institutes, and large enterprises

**6. National initiatives for the training of highly skilled personnel**

- Build master studios and 1,200 training centres for highly skilled personnel around the country to train 10 million highly skilled workers

**Part III – New Systems for Development**

This section is concerned with the fiscal, governance and regulatory reforms required to improve competitiveness and efficiency within the economy, including rebalancing of ownership of enterprises between the state and the private sector.

**Part IV – Agricultural Modernisation**

This section is concerned with agricultural development. It sets out an ambition for self-sufficiency in grains and total food security, and outlines the industrial, practical, structural and technological changes that are required. Within this context, the Plan calls for greater international cooperation particularly in technological development.

## Part V – An Optimised Modern Industrial System

This section is concerned with the reform of the Chinese manufacturing base, and includes reference to the Made in China 2025 action plan. The Make in China 2025 action plan sets out the Chinese Government's ambitions to reform the industrial base. Further information about the initiative is available on the Chinese Government's website<sup>16</sup>.

The proposed objectives for development are summarised in the table below<sup>17</sup>.

### High-End Equipment Innovation and Development

#### 1. Aerospace equipment

- Make breakthroughs in core aircraft engine and gas turbine technologies
- Accelerate the development of large aircraft
- Promote the industrialised development of trunk and feeder route aircraft, helicopters, general-purpose aircraft, and unmanned aerial vehicles
- Develop advanced airborne equipment and systems
- Strengthen supporting systems for civil aircraft
- Develop next generation and heavy-lift launch vehicles, new types of satellites, and other space platforms and payloads
- Make breakthroughs in core technologies for key aerospace components and put them into use

#### 2. Marine engineering equipment and high-tech vessels

- Develop equipment and systems for deep-water exploration, ocean drilling, seafloor resources exploration and development, and marine operations support
- Promote the development and engineering of deep-sea stations and large floating structures and launch projects in this regard
- Focus on breakthroughs in core technologies for cruise ships and other high-tech vessels, as well as for the integrated, intelligent, and modular design and manufacturing of key accessory equipment for such vessels

#### 3. Advanced rail transit equipment

- Develop advanced and reliable rail transit products and light, modular, and serial rail products
- Develop next generation high-speed and heavy-load rail transit equipment and systems
- Become better able to provide users with lifecycle rail transit system solutions
- Set up a national high-speed train technological innovation centre

#### 4. High-grade CNC machine tools

- Develop fast, flexible, and high-precision CNC machine tools, basic manufacturing equipment, and integrated manufacturing systems
- Develop high-grade digitally controlled systems, bearings, gratings, sensors, and other major components as well as key application software, with a focus on improving reliability and retention of precision

#### 5. Robotics

- Develop industrial, service, surgical, and military robots
- Promote independence in the design and production of high-precision retarders, high-speed high-performance controllers, high-performance servo motors and drives, and other key parts and components
- Facilitate the commercial application of artificial intelligence technologies in all sectors

#### 6. Modern agricultural machinery and equipment

- Develop advanced agricultural machinery suitable for all cultivation conditions, with a focus on high horsepower tractors and compound operations machinery, large and efficient combine harvesters, precision seeders, and other food crop equipment, as well as machinery for seeding, farmland management, and harvesting of cotton, sugar cane, and other cash crops

#### 7. High-performance medical equipment

- Focus efforts on the research and development of diagnostic and treatment equipment such as nuclear medicine imaging equipment, superconducting magnetic resonance imaging systems, and non-invasive ventilators as well as in vitro diagnostic equipment such as fully automatic biochemistry analysers and high-throughput genomic sequencers
- Develop and put into use medical accelerators and other treatment equipment as well as implantable and insertable medical devices, such as artificial heart valves and pacemakers, stents, and artificial joints
- Develop and put into use medical devices that utilize the distinctive strengths of traditional Chinese medicine

#### 8. A complete set of advanced chemical machinery

- With the support of projects demonstrating upgrades to the modern coal-to-chemical industry, work toward the independent design and production of a complete set of advanced chemical machinery, focusing on coal classification, coal gasification, syngas purification, energy utilisation, wastewater treatment, and other key areas
- Accelerate research and development on key equipment for the integration of the oil refining and chemical industries as well as for the intensive processing of downstream petrochemical products, and help enhance complimentary support capabilities

To support the development of sectors identified as strategically important, a *National Venture Capital Guide Fund for Emerging Industries* will be established and work to support development. The sectors that have been identified as *Strategic Emerging Industries* are listed in the table below<sup>18</sup>.

## Development of Strategic Emerging Industries

- 1. Innovation in next generation information technology industries**
  - Cultivate integrated circuit industrial systems
  - Foster artificial intelligence, intelligent hardware, new display technologies, smart mobile terminals, 5G mobile communications, advanced sensors, and wearable devices into becoming new areas of growth
- 2. Development of the biotech industry**
  - Move faster to facilitate the wide application of genomics and other biotechnologies
  - Create demonstrations of network-based biotech applications
  - Stimulate the large-scale development of personalised medical treatment, new drugs, bio-breeding, and other next generation biotech products and services
  - Promote the creation of basic platforms such as gene and cell banks
- 3. Intelligent perception of spatial information**
  - Accelerate the construction of national civil space infrastructure, primarily revolving around multimode remote sensing, broadband mobile communications, and the BeiDou Navigation Satellite System
  - Provide systemic technological support and greater capacity for industrial applications within the fields of global telecommunications, disaster prevention and mitigation, natural resource surveys and regulation, urban management, meteorological and environmental monitoring, positioning services, and others
  - Accelerate commercial applications of the BeiDou Navigation Satellite System and remote sensing satellites
- 4. Energy storage and distributed energy**
  - Make breakthroughs in and promote the industrial application of key technologies such as next generation photovoltaics, high-efficiency, high-wattage wind power generation, biomass energy, hydrogen power and fuel cells, smart grids, and new types of energy storage device
  - Facilitate the comprehensive utilisation of distributed new energy technologies
  - Promote the large-scale development of related techniques and equipment
- 5. Advanced materials**
  - Develop smart materials such as shape-memory alloys and self-healing materials, functional nanomaterials such as grapheme and metamaterials, next generation semiconductor materials such as indium phosphide and silicon carbide, new types of structural materials such as high-performance carbon fibers, vanadium titanium alloy, and high-temperature alloys, and also degradable materials and new biosynthetic materials
- 6. New energy vehicles**
  - Promote the use of new-energy vehicles
  - Encourage the use of new-energy vehicles for urban public transport and taxi services
  - Develop all-electric vehicles and hybrid electric vehicles with a focus on making advancements in key technological areas such as battery energy density and battery temperature adaptability
  - Facilitate the development of a network of charging facilities and services that are compatible with each other and come under unified standards
  - Improve policies to provide continuous support in this regard
  - Ensure the cumulative total production and sales figures for new-energy vehicles in China reach five million
  - Strengthen efforts to recover and dispose of used batteries from new energy vehicles

**Part VI – The Cyber Economy**

This section is concerned with the development of the information economy. There is considerable focus upon the telecommunications infrastructure. In an international context, there is discussion of an online Silk Road with the Arab countries and the acceleration of development of the China-ASEAN Information Harbor as well as increasing China's influence in the development of international standards.

**Part VII – Modern Infrastructure Networks**

This section is concerned with the development of general energy, environment and transport infrastructure.

**Part VIII – New Urbanisation**

This section is concerned with urban development and reconciling the growth of the cities and rural areas.

**Part IX – Development Coordinated Between Regions**

This section is concerned with resource allocation and development that takes into account regional divergence and specialism. As elsewhere in the document there is frequent reference to the role of the One Belt, One Road initiative as a mechanism for economic development. There is also reference to taking a greater role in the international maritime and regional maritime order as well as ambitions for research capacity in the Arctic and Antarctic.

**Part X – Ecosystems and the Environment**

This section is concerned with the protection of the environment as well as the economic dimensions of zoning (allocation of different functions for different areas of the country). With regard international cooperation, the South-South Cooperation Fund on Climate Change, a Chinese Government initiative with \$3.1 billion of funding is referenced as a mechanism to achieve change.

**Part XI – All-Around Opening Up**

This section of the Plan is concerned with increasing Chinese international engagement, principally in economic terms. This includes an ambition for the composition of international trade to reflect the changing nature of the economy, with increased export of services. Additionally, this section sets out ambition for financial and regulatory reform to ease international transfer of funds. Again reference is made to the One Belt, One Road initiative as a mechanism for international cooperation. There is specific reference to international cultural cooperation and collaborative action in public healthcare.

In the context of global economic governance, the Plan sets out ambitions to achieve progress in developing free trade relations with the European Union and other regions.

The Plan notes an increased interest in international development and a desire to expand cooperation with developing countries in areas including science, technology and education.

**Part XII – Deeper Cooperation between the Mainland, Hong Kong, Macao and Taiwan**

This section of the Plan sets out the Chinese Government's ambitions to increase the depth of engagement with Hong Kong, Macao and Taiwan respectively.

The Plan states the continued commitment to oppose the independence of Taiwan on the basis of the One China Policy. In order to help promote a unitary identity education cooperation will be encouraged including, deeper 'educational exchanges and cooperation, work to increase the number of mutually recognized credentials and degree, and advance the development of the Experimental District for Fujian-Taiwan Vocational Educational Exchanges and Cooperation.'

**Part XIII – The Fight Against Poverty**

This section is focused upon economic disparity and alleviating poverty amongst the Chinese population through the development of infrastructure, and improved provision of public services and social and economic inclusion.

## Part XIV – Better Education and Health for All Citizens

The section is concerned with improving the quality and amount of provision of education and healthcare.

With particular regard to universities the Plan sets out ambitions to review governance structures, improve teaching staff and curricula as well as differentiated reform of the sector to help realise innovation. Reflecting the wider development focus of the Plan there is particular reference to the development of those universities in the central and western regions.

The table below contains a summarised list of the proposed education reforms<sup>19</sup>.

### Education Modernisation Projects

#### 1. Standards for schools providing compulsory education

- Implement an action plan to accelerate the development of education in the central and western regions
- Gradually ensure that state-run compulsory education schools that cannot yet meet required standards work to bring their buildings, premises, and staffing up to standard

#### 2. Senior secondary education access plan

- Increase senior secondary education resources in poor areas in the central and western regions, particularly in contiguous poor areas
- See that basically all junior secondary school graduates in poor parts of these regions who did not enrol in regular senior secondary education enter into secondary vocational schooling

#### 3. Development of kindergartens open to all children

- Strengthen the development of such kindergartens, focusing particularly on making sure children of kindergarten age in rural parts of the central and western regions as well as children born in urban areas after the introduction of the two-child policy have access to kindergarten education

#### 4. Integration of education into industry

- Support 100 higher vocational institutions and 1,000 secondary vocational schools in strengthening cooperation with enterprises to develop vocational education internship and training facilities
- Support colleges providing undergraduate education in improving their basic conditions including facilities for teaching, conducting experiments, and training
- Establish a number of high-quality applied undergraduate colleges
- Support the development of clusters of emerging disciplines and majors to serve modern industry through cooperation between universities and enterprises

#### 5. Development of world-class universities and disciplines

- Give high priority to supporting the development of a number of world-class universities and disciplines, and ensuring that some disciplines reach the highest ranks worldwide
- Continue the initiative to improve universities' capacity for innovation

#### 6. Development of continuing education

- Support higher learning institutions and vocational institutions in providing continuing education and training for migrant workers in cities, modern professional farmers, modern industrial workers, and demobilised service personnel
- Establish personal learning accounts and an academic credit certification platform

#### 7. Teacher development

- Support the development of teacher training and launch a programme to cultivate high-calibre teachers
- Add to bilingual teacher numbers in areas with concentrations of ethnic minorities and to secondary vocational teacher numbers in poor areas
- Recruit teachers for the special rural teacher programme every year to gradually bring their number to 100,000
- Build accommodations for teachers in rural areas
- Implement the head teacher plan in primary and secondary schools in the

- central and western regions and a plan to attract excellent teachers to universities in these regions
- Strengthen efforts to train special needs teachers

#### 8. Information technology in education

- Move faster in implementing the project to ensure that broadband internet is accessible to each school, quality digital educational resources are accessible to each classroom, and an online learning space is accessible to each student and to put in place platforms for educational resources and management
- Continue support for IT infrastructure construction in rural primary and secondary schools
- Establish a national quality learning resource platform through government service procurement
- Develop modern remote and online learning with a focus on vocational education and applied higher education

#### 9. International exchanges and cooperation in education

- Promote educational activities related to the Belt and Road Initiative
- Implement the study abroad action plan
- Continue to ensure Confucius Institutes are run successful

### Part XV – Support for Public Wellbeing

This section of the Plan concentrates upon the differentiated public service provision required to support the Chinese population until 2020. To encourage lifelong learning and recognition of prior attainment, this includes the provision of ‘public learning accounts and credit accumulation programmes.’

Reflecting the central focus upon innovation and economic reform this part of the Plan contains a sub-section upon higher quality employment. This includes implementing initiatives for ‘guiding them [college graduates] in starting their own businesses, build platforms for innovation and business start-ups, and improve policy incentives to encourage college graduates to start up their own business and work at the community level’. A list of proposed initiatives, including those aimed at university students and graduates is included in the table below<sup>20</sup>.

#### Action Plan for Promoting Employment

##### 1. Initiatives to improve worker competence

- Foster the development of highly skilled personnel
- Improve the skills of new members of the workforce
- Conduct training for already employed workers
- Encourage enterprises to implement new apprenticeship systems
- Develop the skills of workers in urgently needed areas within strategic emerging industries

##### 2. Promotion of the employment and entrepreneurial activities of college graduates

- Improve the real name database of college graduates who have not yet found employment, and provide employment information, vocational guidance, employment internships, and other employment services for college graduates
- Make education on starting new businesses more widespread and strengthen entrepreneurship training
- Implement a plan for college graduates to gain experience through community-level work

##### 3. Migrant worker vocational skills training

- Through targeted training programmes and training for specific job and business demands, provide employment skills training for rural junior and senior secondary school graduates who have not moved on to the next level of education as well as other new generation migrant worker groups
- Provide entrepreneurship training for migrant workers who wish to start their own businesses
- Work to see that the number of training opportunities enjoyed by migrant workers reaches 40 million

## Action Plan for Promoting Employment (cont.)

### 4. Vocational training for groups with special employment needs

- Strengthen vocational skills training and entrepreneurship training for children of families with financial difficulties, older unemployed persons, workers reemployed in other fields, former military personnel, and workers with disabilities
- Provide training subsidies in accordance with regulations
- Offer living allowances to people from rural families with financial difficulties and from urban families receiving subsistence allowances who are engaged in apprenticeships

### 5. Public services for employment and business start-ups

- Improve public service facilities for employment and business start-ups
- Support the establishment of demonstration areas for business start-up that have been established by people returning to their hometowns
- Establish regional public training centres
- Ensure service facilities for employment and business start-ups are established in all counties
- Accelerate data sharing among different departments
- Improve the basic public service system for personnel files on the floating population

## Part XVI – Socialist Cultural and Ethical Progress

This section concentrates on mechanisms to spread preferred civic ideals online and within society at large. Part XVI contains sub-sections upon cultural exchange and cooperation, and communication with international audiences. Proposed activities include international exchange by Government and non-Government actors, supporting overseas Chinese organisations and greater engagement with international media organisations.

## Part XVII – Better and More Innovative Social Governance

This section of the Plan includes discussion of a wide range of topics including civic rights, dispute resolution, national security and occupational safety.

## Part XVIII – Socialist Democracy and Rule of Law

This section concentrates upon a broad range of areas that include the rule of law and party discipline. Specific reference is made to the Plan for Building Rule of Law Government (2015–2020), a policy document released by the Central Committee which calls for a number of actions including making certain information available to the public in a more routine manner.

## Part XIX – Coordinated Economic and Defence Development

This section concentrates upon the development of the armed forces.

## Part XX – Implementation

The final section of the Plan sets out broad responsibilities for the elaboration and subsequent implementation of the initiatives proposed within. In brief, ‘relevant departments under the State Council shall organize the formulation of a set of national subject-specific plans’ with local government taking responsibility for region specific activity to be developed in alignment with national plans. The NPC Standing Committee shall have ultimate authority for approving any adjustments required to the plan as a whole.

The Plan closes with a reiteration of its purpose to achieve the realisation of a ‘moderately prosperous society in all respects.’

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