China’s 13th Five-Year Plan
Opportunities for Finnish Companies

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T ek es
What is a five-year plan?

Since 1953, China’s central government has outlined its investment priorities, economic strategies and guidelines for achieving medium and long-term growth in the form of five-year plans, a tradition that it borrowed from the Soviet Union. The quota-driven nature of the earlier planning tradition has since evolved to focus on broader development outlines. Nonetheless some targets from the national plan are still considered “binding” and failure to achieve them is detrimental to officials’ career prospects.

Much of China’s 13th Five-Year Plan was announced at the close of the Chinese Communist Party’s Fifth Plenum in October 2015, but the formal adoption of the Plan was by the National People’s Congress on March 14, 2016 (the voting result was 2,778 for, 53 against, with 25 abstentions). This followed a lengthy drafting process led by the National Development and Reform Commission, which commissioned contributions from every government ministry, as well as from provinces, industrial associations and academics. In turn, ministries as well as provincial and municipal governments are required to file their own five-year plans, which will be implemented in tandem with the national strategy. Thus the Five-Year Plan is itself a symbol of continuity and integration within the bureaucracy.

Moreover the 13th Five-Year Plan has particular political significance: it is the first Plan under President Xi Jinping’s administration, and is a triumphant symbol of the duration of the Chinese Communist Party’s rule—the USSR had only just begun its own 13th Five-Year Plan when it collapsed. China’s 13th Five-Year Plan also has political resonance with China’s “centennial goals”, which call for doubling China’s average disposable income from its 2010 level, as well as ending absolute poverty by 2020. These goals, as articulated by President Xi, comprise part of the “China dream” of national revival, and their accomplishment will be a highlight of the 100th anniversary of the Chinese Communist Party in 2021. The government feels that to meet this target, economic growth will need to be maintained at a minimum 6.5% average annual pace over the course of the 13th Five-Year Plan.

China’s economic transition

China’s economy is now decelerating from the double-digit growth that characterised its earlier development during the 11th and 12th Five-Year Plans (2006–10 and 2011–15 respectively), when high investment levels incurred significant corporate and local-government debt, as well as overcapacity in the industrial and property
sectors. In the words of Prime Minister Li Keqiang, China has now entered its “new normal” phase. In keeping with a slowing pace of economic growth, the Chinese Communist Party’s Third Plenum in late 2013 announced a reform agenda, the *60 Decisions*, which outlined plans to boost the country’s transition from export-oriented mass manufacturing and infrastructure investment to higher-value manufacturing, domestic consumption and services. Underlying the *60 Decisions* is a commitment to market-oriented, sustainable growth, although the key role of State-Owned Enterprises (SOEs) is still endorsed. A newly-formed *Small Leading Group for Comprehensive Reform*, chaired by President Xi, has become an important player in the implementation of China’s economic reform agenda.

Much of China’s industrial overcapacity is in the state sector, and the 13th Five-Year Plan calls for the government to continue with SOE reform through a “mixed ownership model.” This echoes the key government document issued by the State Council in September 2015, *“Guiding Opinion on Deepening Reform of the State-Owned Enterprises”*, which calls for mergers and private investors in order to bring new capital and market discipline to the sector. The guidelines propose five key areas for action: classify the SOEs as either public-services or for-profit entities, accelerate SOE modernisation, enhance the state-owned assets management system, promote mixed ownership and toughen oversight.

Following the lead of the Third Plenum, and congruent with the nation’s “centennial goals”, the 13th Five-Year Plan contains five main tenets for creating a “moderately prosperous society”: innovation, openness, environmental stewardship, co-ordination and inclusion. These principles underpin the specific policies outlined in the 13th Five-Year Plan, and are to support the rebalancing of the economy.

Prime Minister Li Keqiang announced in March 2016 that China had met its key targets from the 12th Five-Year Plan. The metrics he cited were certainly impressive: growth had been over 7% each year, GDP per capita had risen to just under Rmb 50,000, China had become the world’s largest trader and a significant global investor, and had also officially become an “urban” country, with over 50% of its population living in towns or cities. In addition, the renminbi had joined the basket of currencies which make up the IMF’s Special Drawing Rights.
What is in the 13th five-year plan?

The 13th Five-Year Plan does not explicitly identify a GDP growth target, but the implied target is 6.5% growth annually in order to meet the “centennial goals” of doubling real GDP and per capita income by 2020 from the 2010 base. Many of the key “binding” targets identified in the 13th Five-Year Plan are environmental or livelihood issues, such as extending coverage of urban welfare services to all residents, universal enrollment in retirement and critical illness healthcare plans and lifting 70m people out of poverty by 2020.

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<thead>
<tr>
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<tbody>
<tr>
<td>Nominal GDP</td>
<td>Rmb55.8trn</td>
<td>Rmb67.7trn</td>
<td>&gt;Rmb92.7trn</td>
</tr>
<tr>
<td>Annual real GDP growth</td>
<td>7%</td>
<td>7.8%</td>
<td>&gt;6.5%</td>
</tr>
<tr>
<td>Tertiary sector as a proportion of GDP</td>
<td>47%</td>
<td>50.5%</td>
<td>56%</td>
</tr>
<tr>
<td>Urbanisation rate</td>
<td>51.5%</td>
<td>56.1%</td>
<td>&gt;60%</td>
</tr>
<tr>
<td>Urban household registration (hukou) rate</td>
<td>n/a</td>
<td>39.9%</td>
<td>45%</td>
</tr>
<tr>
<td>Urban job creation</td>
<td>45m</td>
<td>64m</td>
<td>50m</td>
</tr>
<tr>
<td>Construction of affordable housing units</td>
<td>36m</td>
<td>27m</td>
<td>n/a</td>
</tr>
<tr>
<td>R&amp;D spending as a proportion of GDP</td>
<td>2.2%</td>
<td>2.1%</td>
<td>2.5%</td>
</tr>
<tr>
<td>Reduction in carbon emissions per unit of GDP</td>
<td>17%</td>
<td>20%</td>
<td>18%</td>
</tr>
<tr>
<td>Reduction in energy consumption per unit of GDP</td>
<td>16%</td>
<td>18.2%</td>
<td>15%</td>
</tr>
<tr>
<td>Farmland reserves (mu)</td>
<td>1.82bn</td>
<td>1.86bn</td>
<td>1.86bn</td>
</tr>
<tr>
<td>Forest coverage rate</td>
<td>21.66%</td>
<td>21.66%</td>
<td>23.04%</td>
</tr>
</tbody>
</table>

Note. 1 mu is equivalent to 666.7 sq metres
Source: Xinhua News Agency.

Industrial restructuring

The 12th Five-Year Plan listed seven “emerging strategic industries” for national attention, and the 13th Five-Year Plan broadens the scope further. Both plans dovetail with the Made in China 2025 industrial agenda, which was released in May 2015 by the Ministry of Industry and Information Technology (MIIT). Made in China 2025 in turn was modeled on templates, pioneered by Germany and Japan, to upgrade and digitise industrial production under the term “Industry 4.0”, and it emphasizes the need for enterprises to strengthen their design capabilities and brands.

Made in China 2025 stresses ten high-tech industries for particular encouragement by China’s state agencies: aviation and aerospace; agriculture; electrical power; new energy automotives; high-end robotics; next generation information technology; new materials and composites; rail transportation; maritime engineering; biomedical and advanced medical equipment. The cumulative value of the “strategic emerging industries” is expected to account for 15% of total GDP by 2020.
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The 13th Five-Year Plan also references the “supply-side” economic reform1 agenda set out by the government in early 2016, using the terminology of the “circular economy”. According to this agenda, overcapacity sectors—coal and steel are cited specifically—will be restructured so that more innovative, competitive, and environmentally-friendly market leaders will emerge through consolidation. The 13th Five-Year Plan also discusses “innovation-driven development” and identifies Beijing and Shanghai as “international innovation centres”, and announces the establishment of new national science laboratories.

### SEIs vs “Made in China 2025” Ten Key Industries vs Circular Economy

<table>
<thead>
<tr>
<th>SEI</th>
<th>Made in China 2025</th>
<th>Circular Economy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Energy Saving &amp; Environmental Protection</td>
<td>Energy Saving &amp; Clean-Energy Vehicles</td>
</tr>
<tr>
<td>2</td>
<td>New Energy</td>
<td>Power Equipment</td>
</tr>
<tr>
<td>3</td>
<td>Bio-technology</td>
<td>Biomedical &amp; High Performance Medical Devices</td>
</tr>
<tr>
<td>4</td>
<td>New Materials</td>
<td>New Materials</td>
</tr>
<tr>
<td>5</td>
<td>Next Generation IT</td>
<td>Next Generation IT</td>
</tr>
<tr>
<td>6</td>
<td>Clean-Energy Vehicles</td>
<td>Advanced Rail Transportation Equipment</td>
</tr>
<tr>
<td>7</td>
<td>High End Manufacturing</td>
<td>Advanced CNC Machine Tools &amp; Robots</td>
</tr>
<tr>
<td>8</td>
<td>Agricultural Machinery</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Aerospace Equipment</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Marine Engineering Equipment &amp; High-tech Ship</td>
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</tbody>
</table>

Source: State Council

Major science and technology projects are identified for the next 15 years: aerospace, deep-sea, quantum computing; neurology research, national cyberspace security, space probes and spacecraft. Other projects listed for state support are in agribusiness (notably the seed industry); clean-burning coal; smart grids; new-generation IT and big data, internet-enabled manufacturing and new materials.

### Regional development

A difference between the 12th and 13th Five-Year Plans is in regional economic planning. Special plans to integrate the Beijing-Tianjin-Hebei (“Jìng-jìn-jì”) region and develop the Yangtze River Economic Belt are given their own sections in the 13th Five-Year Plan for the first time. The Yangtze River Economic Belt focuses on industry transfer from coastal to inland regions and differentiated industrial clustering around key urban centres in 11 provinces: Guizhou, Yunnan, Sichuan, Chongqing, Hunan, Hubei, Jiangxi, Anhui, Zhejiang, Jiangsu and Shanghai. The broad aim of the two projects is to encourage collaborative cross-provincial development and a more integrated approach to infrastructure planning.

The One Belt, One Road (OBOR) initiative is also included in the 13th Five-Year Plan for the first time. As well as boosting China’s regional influence, tapping overseas markets is also envisaged as a way of absorbing excess domestic industrial capacity. Specific projects included in the 13th Five-Year Plan

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1 According to Xinhua, “supply side” economic reforms encompass many aspects: cutting housing inventories, tackling debt overhang, eliminating superfluous industrial capacity, cutting business costs, streamlining bureaucracy, urbanisation and abandoning the one-child policy are all examples of supply-side reforms.
in relation to OBOR include a logistics park in Lianyungang (Jiangsu) for members of the Shanghai Co-operation Organisation and various transport links between border provinces and neighbouring countries.

**Selected projects included in the 13th five-year plan (2016-20)**

<table>
<thead>
<tr>
<th>Plan</th>
<th>Purpose</th>
<th>Project Description</th>
<th>Province (prefecture)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yangtze River Economic Belt</td>
<td>To build a “high-quality” transportation corridor</td>
<td>Shipping centre</td>
<td>Hubei (Wuhan)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Upgrade of Yichang-Anqing channel</td>
<td>Hubei (Yichang/Anqing)</td>
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<tr>
<td></td>
<td></td>
<td>Regional shipping logistics centre</td>
<td>Jiangsu (Nanjing)</td>
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<tr>
<td></td>
<td></td>
<td>Shipping centre</td>
<td>Chongqing</td>
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<tr>
<td></td>
<td></td>
<td>Construction of Zhoushan River transportation service center</td>
<td>Zhejiang</td>
</tr>
<tr>
<td>One Belt, One Road</td>
<td>Crossborder trade and investment</td>
<td>Develop Fujian into the core area of 21st-Century Maritime Silk Road</td>
<td>Fujian</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Develop “pivot” cities of the 21st-Century Maritime Silk Road</td>
<td>Fujian (Fuzhou, Quanzhou), Guangdong (Zhanjiang, Guangzhou), Guangxi (Beihai), Hainan (Haikou)</td>
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<tr>
<td></td>
<td></td>
<td>Shanghai Co-operation Organisation (SCO) logistics park</td>
<td>Jiangsu (Lianyungang)</td>
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<tr>
<td></td>
<td></td>
<td>China-Kazakhstan Logistics Co-operation Base</td>
<td>Jiangsu (Lianyungang)</td>
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<tr>
<td></td>
<td></td>
<td>Develop Xinjiang into the core area of the Silk Road Economic Belt</td>
<td>Xinjiang</td>
</tr>
<tr>
<td>The development of special regions</td>
<td>Crossborder trade and investment</td>
<td>Promote Guangxi as an “international channel” towards ASEAN</td>
<td>Guangxi</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Promote as a “pivot of cooperation” with Northeast Asia</td>
<td>Heilongjiang, Inner Mongolia, Jilin</td>
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<tr>
<td></td>
<td></td>
<td>Changchun-Jilin-Tumen Development and Opening-Up Pilot Zone</td>
<td>Jilin, Liaoning</td>
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<tr>
<td></td>
<td></td>
<td>Promote Tibet as an “international channel” towards South Asia</td>
<td>Tibet</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Promote Xinjiang as a “window” towards the west</td>
<td>Xinjiang</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Promote Yunnan as a “radiation centre” towards South Asia and South-east Asia</td>
<td>Yunnan</td>
</tr>
</tbody>
</table>

Source: Xinhua

**Urbanisation**

The 13th Five-Year Plan calls for an increase in the urbanisation rate to 60% of the population, from 56.1% in 2015. Successful implementation of this target will depend to a large measure on the government’s commitment to reforming the *hu kou* (household registration) system so that rural migrants can be integrated into urban social welfare schemes. *Hu kou* reforms are based on the *National Plan on New Urbanization (2014-2020)*, which encourages migrants to settle in secondary and tertiary cities, according to selection criteria that include migrants’ job skills and the population density of their intended destination. Migration to larger metropolitan areas is to remain strictly controlled.
The 13th Five-Year Plan makes specific mention of the “three 100m people” scheme, whereby 100m rural migrants are granted urban *hu kou*; slum clearance and urban renewal will benefit 100m; and urban residence rights are granted to 100m people in the central and western provinces. The Plan also discusses “smart city” initiatives, whereby IT-linked social services add efficiency and convenience to urban environments.

The Plan also mentions rural housing and environmental issues, committing to an 80% coverage rate for rural water supply, along with broad renovation efforts for village housing, rural broadband, river and pond remediation and rural garbage collection, and with a 90% target for rural sewage treatment. Village electrification should be universal (the target is 99.8% connectivity). The 13th Five-Year Plan stresses the promotion of agribusiness through reforms to farmland property rights and improvements to yields and food safety with an aim of 800m mu (one mu = .06 hectare) of “high-standard farmland”. Issues related to land reform and food safety improvements appear frequently in government rhetoric, but these specific goals still lack detailed implementing guidelines.

**Ageing and Health**

The 13th Five-Year Plan places emphasis on more equitable provision of basic public services and on poverty alleviation, with a pledge to lift all 70m rural people currently below the national poverty line by 2020 (defined as below Rmb 2,300 in annual income). Indeed, alleviating poverty has become a “binding” target for officials, as has meeting environmental targets.

The 13th Five-Year Plan also discusses demographic challenges, revising the one-child policy to permit couples a second child and extending social security to the entire elderly population. The latter measure is especially important in light of the currently fragmented provincial and municipal pension plans, as the lack of portability of pensions is an impediment to full labour mobility.

The role of government as a service provider is discussed in the Plan, with officially sanctioned NGOs expected to participate in social economic development (poverty reduction and community services). Moreover, the Fifth Plenum highlighted a number of specific welfare policies to support vulnerable populations, such as the rural elderly and “left-behind” children of migrant workers.

Medical insurance coverage, which was extended to most of the national population during the 12th Five-Year Plan, is to receive additional funding (the target for enrollment is 95% of the national population), and a critical illness insurance system is to be implemented. Out-of-province health care costs are to be reimbursable through medical insurance and primary health care and support for rural doctors is to be improved. The Plan calls for a gradual introduction of general practitioners (family doctors) and the number of practicing physicians per 1,000 people should increase to 2.5 (the current level is 2).

Elder care is to be enhanced through better services, such as geriatric nursing homes and community day-care centres, as well as “smart communities” for old-age care and elderly-friendly facility renovation. Infant and maternal mortality rates are to decline, and longevity to increase—similar to previous Plans, the 13th Five-Year Plan even includes metrics for longevity improvements, with average life spans to increase by one year (the current average is 76.34 years).
Labour

The 12th Five-Year Plan mandated hefty annual wage increases to minimum wages, but the 13th Five-Year Plan takes a much less assertive stance on wage increases, calling instead for “rationally determined minimum wage rates”. In addition, the “five insurances and one fund” employer-contributed social welfare allocations are to be streamlined and integrated, and employer costs are to be reduced. In deference to China’s demographic challenges, the 13th Five-Year Plan proposes to raise the retirement age, but does not give specific details.

The 13th Five-Year Plan discusses reforms to vocational training in China, specifying reduced tuition charges as well as improved alignment with industrial requirements. A provisional Rmb100bn fund was established to support workers made redundant by SOE restructuring.

Consumption

China is in transition to becoming a consumption-driven economy, and the 13th Five-Year Plan pledges to improve consumption levels. Specific policies to achieve this goal include encouragement of closer integration with markets (such as the elder market), the integration of offline and online consumption, and stronger consumer protection. In line with projected gains in household income, consumption patterns in China are expected to become more varied, and both premium and mass market purchases will grow. E-commerce will continue to extend the reach of modern retail to small towns and rural areas, supported by growth in logistics and distribution networks. The Plan discusses incentives to encourage domestic purchases rather than cross-border or international sales—so far, these incentives have taken the form of tax cuts, to lessen price arbitrage. Further attention to food and product safety would also boost confidence in domestically produced goods.

Overall consumption per capita in China is expected to grow steadily—according to The Economist Intelligence Unit’s forecasts, private consumption per head will grow from the 2016 figure of US$3,331 to US$4,508 in 2020, while the number of households with annual earnings over US$5,000 will rise from the current 337m to 403m by 2020.

Energy and environment

Most of the 13th Five Year Plan’s energy and environment measures are taken from the Energy Development Strategy Action Plan 2014-2020, and the Environment Protection Law (2015) although China’s subsequent adoption of more demanding goals (its Intended Nationally Determined Contribution to COP 21) raised some targets from the 2014 master plan. The Environment Protection Law delegates greater authority to environment officials to impose heavier fines and close down polluting plants.
The 13th Five-Year Plan includes, for the first time, a “binding” target for the reduction of PM 2.5 levels of air pollution. Volatile organic compounds are also to be reduced. In addition to air pollution, water conservation and treatment of polluted waterways are stressed, with water use per unit of GDP expected to be reduced by 23%, along with soil remediation efforts. Local officials will be held responsible for implementing “binding” targets for environment amelioration. A national emissions trading scheme is to be introduced in 2017 and a Green Development Fund is to be established to help finance industrial upgrades.

According to the 13th Five-Year Plan’s targets, China’s energy consumption and carbon emissions per unit of GDP (carbon intensity) are to be cut by 15% and 18% respectively. Overall, the country will cut its reliance on coal and promote clean energy, notably through commitments to nuclear energy (58 GW by 2020, with an additional 30 GW under construction). In the course of the 13th Five-Year Plan, this will mean between six and eight nuclear reactors are to be commissioned each year. Wind capacity will be expanded to 250 GW, and solar energy to 150 GW by 2020.

The 13th Five-Year Plan also includes a reduced logging quota (6.3% reduced) for domestic timber, and expands the ban on commercial logging in the north-eastern provinces to all natural forests by 2017. Wood imports from Southeast Asia, Africa and Russia are likely to fill the gaps.

Management of China’s water resources is to be strengthened through a national conservation plan, with quota-based management for industrial and household water use in China’s arid provinces, while water recycling and water efficiency labeling are to be introduced. Sewage and solid waste treatment in industrial parks, cities and rural areas is to be upgraded and monitored, and a green tax system will be set up.

**External trade**

Although China now leads the world in trade, overall global trade has declined, and the outlook remains challenging. Following the launch of the first national free-trade zone (FTZ) in Shanghai in 2013, three new FTZs were set up in 2015 in Tianjin, and Guangdong and Fujian provinces, and more are expected. The 13th Five-Year Plan commits China to further opening up its trade and investment, with the adoption of a “negative list” approach for enhanced regulatory clarity on market access and...
investment sectors. In fact the State Council issued *Opinions on Implementing a Market Access Negative List System* in October 2015—according to this document, the negative list system is to be piloted in the FTZs until end-2017, with nation-wide implementation expected in January 2018.

Parallel with its support for the WTO and multilateralism, China will pursue additional free trade agreements and trans-boundary projects, such as the One Belt, One Road policy, which it will facilitate through cooperation with the Asia Infrastructure Investment Bank (AIIB). China will accelerate negotiations on the Regional Comprehensive Economic Partnership (RCEP), as well as for further free trade agreements. Examples of these include the China-Gulf Cooperation Council FTA, the China–Korea–Japan FTA, and deals with Israel, Canada, the Eurasian Economic Union and the EU are also under negotiation. In addition, work related to the Asia-Pacific trade zone and investment agreements with the US and the EU will also continue.

In line with the changes in the Chinese economy, the 13th Five-Year Plan focuses on an increase in trade in services, which the Plan targets to comprise 16% or more of foreign trade. Reciprocal growth in foreign investment in services will be encouraged, in sectors such as financial services and design.

### Currency, Monetary Policy

China’s path towards financial reform is in line with the *60 Decisions* adopted at the close of the Third Plenum in 2013, and broad goals, such as the full convertibility of the currency by 2020, are noted in the 13th Five-Year Plan. One objective, for the renminbi to join the reserve-currencies basket of the International Monetary Fund, has already been achieved; the IMF on November 30th 2015 approved the inclusion of the renminbi in the basket with effect from October 1st 2016.

As part of promoting the renminbi’s globalisation, China has entered into bilateral currency-swap agreements with 33 countries and regions since 2009 and has also encouraged the development of offshore renminbi centres. The 13th Five-Year Plan discusses the further adoption of internet finance, and commits to better credit data and consumer protection, and to combating illegal financing.

### Property

The 13th Five-Year Plan’s discussion of property underscores the protection of property rights, including the collective property rights in rural areas, and pledges to improve land registration procedures and establish a unified registration system for real estate. Slum clearance work is to be improved, and the Plan places new emphasis on improvements to the rental market, in the form of rental subsidies for low-income households, and access to public rental housing for migrants. Interestingly, the Plan does not quantify public housing construction quotas—under the *National New Urbanisation Plan (2014–2020)* China had already committed to increasing the number of “green buildings” from the current 2% of new buildings, to 50% of all new construction by 2020. Achieving this enormous increase will necessitate upgrades to building materials and building codes, particularly

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1 The 13th Five-Year Plan does not mention the Trans Pacific Partnership (TPP). China is not a member of the TPP and instead has promoted the RCEP.
for better insulation materials—this will provide new market opportunities for enterprises in the currently depressed construction materials sector.

**Opportunities for Finnish companies**

The national 13th Five-Year Plan encompasses a number of broad, top-down industrial blueprints and national development goals. In addition, sector-specific 13th Five-Year Plans are drafted by key industry associations, in line with the overarching “Made in China 2025” template. These sectoral plans usually include restructuring older industrial technologies and capacity, timelines for investment in R&D and quotas for gaining market share. For example, the China Association of National Shipbuilding Industry’s five-year development plan calls for the production of more high-tech ships and oceanic engineering equipment, so that Chinese companies will account for 35-40% of the global market by 2020.

Although private investment and “innovative market forces” are seen as positive enhancements to this process, the dominant theme is a technocratic, lockstep approach to industrial restructuring and market development. Government guidance and investment channels are seen as essential for success, and a central aim is national self-sufficiency, especially for key strategic sectors.

**Digital industry**

With digitisation a key theme of the “Made in China 2025” industrial template, the 13th Five-Year Plan includes a number of targets for automating manufacturing and promoting digital applications. There is also a strong emphasis on developing domestic capabilities in design and manufacturing so as to replace imports.

**ICT**

The 13th Five-Year Plan calls for the improved national optic fibre coverage (extending rural coverage to 98% of villages), as well as the full roll-out of 4G mobile communication technology. In practical terms, increased internet speeds, better coverage and cheaper service are seen as requisites to the implementation of “internet-plus” advances in manufacturing and services, and to facilitating the growth of e-commerce through cloud-based data analytics and enterprise resource management.

Mobile broadband penetration is to increase from the current 57% to 85% and fixed broadband from 40% to 70%. China’s three mobile operators already invested Rmb 92bn in 4G operations in 2015, boosting the number of base stations to over 1.5m throughout the country (China Mobile invested Rmb 56bn, China Telecom spent Rmb 23bn and China Unicom Rmb 12.6bn. Ownership of the base stations is in line with these stakes: China Mobile has over one million TD-LTE base stations, while China Telecom has 360,000 outdoor and indoor base stations, while China Unicom has 213,000).

China has announced 2020 as the target year for the development of 5G, and work on 5G technology
and “ultra-wideband” plus upgrades to internet protocol Version 6 (IPv6), as well as cloud computing and artificial intelligence technology is already underway. The 5G project is under the leadership of the Ministry of Industry and Information Technology (MIIT), with support from the National Science and Technology Commission, as a “major project”. The main objectives of the project are to establish 5G international standards, and boost 5G’s commercial viability. According to the Plan, the work is to be conducted in two tranches: the first stage will continue until 2018 with technical testing of prototypes, and will be followed by testing on networking performance.

**Integrated circuits (IC)**

The “National Semiconductor Industry Development Guidelines” were announced by the State Council in June 2014, and are to promote domestic design innovations and fabrication, with the aim of boosting China’s indigenous production of semiconductors. Reliance on semiconductor imports is seen as a major vulnerability in the nation’s supply chain, and the Guidelines stress the need for upgrades to domestic suppliers so as to replace imports. The target for self-sufficiency in this sector is to supply 40% of the national market by 2020, growing to 70% by 2025. This is a big step upwards, as currently China’s electronic manufacturing sector imports most semiconductors, particularly multi-component semiconductors (MCOs), key inputs for handsets and networking equipment for telecom manufacturing. A Rmb 120bn national industry investment fund was created for this purpose, and local semiconductor foundries are being supported to upgrade their design and production capacities through technology transfers and M&A.

**Clean tech**

Pollution control and pollution amelioration products and services will be a strong focus of business development, particularly as pollution targets are now taken much more seriously by Chinese local officials (with their “binding targets” for carbon emission reductions) and by enterprises, as pollution taxes become more onerous. The renewable energy sector has suffered from overcapacity problems in the past, particularly for domestic manufacturers of rudimentary models of solar panels and wind turbines, so the key emphasis for new market opportunities will be for higher-grade products. Water treatment and water conservation products will be in demand at both the large-scale city level and for rural use, as will soil remediation technology for brownfield and agricultural use.

Energy-related industrial templates have undergone some revisions during the course of drafting the 13th Five-Year Plan, as more aggressive carbon-reduction targets and investments in renewable energy were adopted. Hydropower (notably in Southwest China), wind power and photovoltaic power investments will all be increased, but the real emphasis is on nuclear investment (nuclear power installation capacity will reach 58m kw by 2020) and the reduction (or relocation) of coal-burning electricity generation. Specific goals relate to further investment in “smart grid” technology, as well as improvements to oil refining technology and the upgrading of outdated “teapot” refineries.

The 13th Five-Year Plan’s emphasis on technological breakthroughs extends to energy-related products and services, including new generation photovoltaic cells, as well as hydrogen and fuel cells
and new energy storage devices. Another potentially gigantic project is the roll out of electric vehicle charging stations in urban centres, which will be essential if the government is to proceed with its e-car strategy. While implementation of this will no doubt vary from city to city, there will be a major push for consistency in charging standards, with a sales target of 5 million new energy vehicles. Taxis and public transport fleets are to popularise e-vehicles while extended-use batteries, battery recycling, and improved temperature adaptability are to make battery use more stable and convenient.

Grid improvements are to include technical upgrades for more efficient power distribution through high-voltage lines, as well as administrative improvements to the power pricing regulatory regime. The government will end the monopoly of SOE power distributors over electricity sales, and regional trading platforms for electricity will reduce tariffs.

**Carbon trading**

A national carbon trading programme is to be introduced in 2017. While full details have not yet been released, based on the precedent of seven regional pilot projects, enterprises that have an annual energy consumption equivalent to 10,000 tons of coal per year (as measured in 2013–2015) are to be eligible to participate in the scheme. Sectors that are currently classified as “overcapacity” or “circular” will come under particular scrutiny, as their potential to participate in carbon trading schemes will be a determinant of whether they can continue operation. The affected sectors include power (generation, co-generation and grid); petrochemical (crude processing, ethylene production); chemical (ammonia, carbide and methanol production); building material (cement clinker production, plate glass production); iron and steel (crude steel production); non-ferrous metal (electrolytic aluminum, copper smelting); paper making (pulp production, paper making); aviation (passenger air transport, air cargo transport and airports).

**Wood products, wood-based technologies**

Apart from business opportunities to provide timber exports to China, thanks to the reduced logging quota for domestic timber, wood-based technologies to improve yields and efficiencies will be in demand. As indicated above, China’s paper making sector is suffering from overcapacity, and is characterised by many small enterprises (over 3,000 small mills, supplying for over 80% of the market) that have low industrial standards and poor prospects. Modernisation plans for the industry include technological upgrades as well as mergers to foster the growth of large, market-leading domestic enterprises.

Waste paper recycling volumes and capabilities are also part of the upgrading strategy (the present recycling recovery rate in China is less than 50%, which is lower than the global average). Other improvements are to upgrade the raw material supplies, to include domestic waste paper pulp and fibres (e.g. bamboo pulp) as well as non-wood fibres (bagasse). Other planned improvements are
to reduce water intake and energy consumption in production processes, and specific targets are identified to reduce the discharge of ammonia nitrogen and other chemicals.

Bio-pharmaceutical investments will be aimed at commercial applications of new technology such as genomics, which in turn will be expected to demonstrate the viability of personalised treatments and drug formulations. Gene and cell bank investments will be the key focus for this work. Biotechnology solutions will encompass biofuels (cellulosic ethanol, as well as algae-based bio-manufacturing and micro-algae oil technology). Biofuel use is specifically mentioned in the 2014-2020 Energy Development Strategy Action Plan, and currently six provinces have mandatory blending of 10% ethanol with gasoline.

**Advanced and new materials**

Key investments are expected in the ten high-tech sectors that are specifically identified in the Made in China 2025 template (aviation and aerospace; agriculture; electrical power; new energy automotives; high-end robotics; next generation information technology; new materials and composites; rail transportation; maritime engineering; biomedical and advanced medical equipment) will all receive further attention and government funding.

Of particular interest are the “new materials and composites”, which are referenced in the 13th Five-Year Plan as “new generation smart materials”—these include functional nanomaterials, such as high performance carbon fibres, as well as bio-degradable and bio-synthesized materials. According to the industrial template for this sector, the aim is for China to achieve self-sufficiency as well as some exports strength by 2020, and for domestic companies to grow to a 90% share of the domestic market by 2025.

High-performance carbon fibres were initially featured in the 12th Five-Year Plan, and the National Natural Science Foundation of China has allocated Rmb 300m for research on graphene applications, such as composites, electronic and electrical industries and storage. The objective is to transform R&D into commercial applications worth Rmb 10bn by 2020, through technical adaptations for aerospace, marine, electronic information and new energy industries, and to grow this market to Rmb 100bn by 2025.

**Robotics**

In 2013 the Ministry of Industry and Information Technology (MIIT) released the Guidance on Promotion of Development of the Robot Industry, which outlined development plans for the development of robotics to 2020. These plans include the growth of up to five market-leading domestic manufacturers of robots, and a “quota” of robot population density (number of robots per 10,000 workers) at over 100 robots.

In 2013 China actually became the world’s biggest market for industrial robots, and continued
to grow at a very fast pace throughout the course of the 12th Five-Year Plan period. Rising labour costs as well as government incentives to automate production have been major boosts to sales, which are forecast to rise further during the 13th Five-Year Plan. Guangdong has been particularly active in encouraging the robotics industry through promotional policies, subsidies and production targets (these include the manufacture of 100,000 units per year), which cover the use of robotics for manufacturing in machinery, autos, food processing, pharmaceuticals, electronics and hazardous materials. For example, ABB has signed a Memorandum of Understanding with Guangdong and has established a centre for the practical application of robots in the Zhuhai Hi-Tech Industrial Development Zone, and KUKA has set up a robotic training facility in Foshan.

Robotic sales have been led by such prominent foreign robot suppliers (starting with imports, but now with local manufacturing), and are now also competing with Chinese domestic manufacturers, according to the China Robot Industry Alliance. Robot sales to the automotive industry, and to automotive electronic parts suppliers for battery production have been especially strong. Other key sectors that have incorporated high numbers of robotics in assembly lines include the electronic and electrical sector (for ICT manufacturing, as well as medical and optical devices and instrument fabrication).

The high-end robotics market in China has already shown strong development, and is expected to grow to an estimated volume of 150,000 robotic operations by 2018, according to the International Federation of Robotics. This would be a 160% increase over the present capacity.

**Transport**

Increased urbanisation and urban transit systems are already boosting business opportunities for suppliers of high speed and subway rolling stock, industrial automation and signaling equipment, and as the government plans to expand the high-speed railway network from 19,000 km to 30,000 km by 2020 this market is enormous. Another transport-related wishlist includes 50 new airports—these will likely include greenfield projects, extensions of existing facilities, or the conversion of military airports to civilian.

**Local government implications**

Each provincial and municipal government will release respective Five-Year Plans, which are to align with the national Plan, but which showcase local characteristics and specific industry focus. In fact many of the local plans have set growth targets that are higher than the national average—much higher, in some instances: Hefei announced it is aiming for “double-digit” growth.

Notable local announcements have included Chongqing’s plans to invest Rmb 400bn in transport improvements, while Zhejiang is to boost water conservancy in the province by Rmb 300bn. A new initiative is to promote partnerships with neighbouring municipalities. Chengdu, capital of
Sichuan province, is to co-operate with satellite cities Deyang and Mianyang in a regional effort to develop “spillover” high-tech zones. In another instance of “spillover” benefits from mega-city hubs, Guangzhou and Shenzhen are to retain their hu kou restrictions, but neighbouring “spoke” municipalities (e.g. Foshan, Zhuhai, Dongguan and Zhongshan—all of which have improved transport links to their respective urban hubs—are to ease residency requirements for migrant workers. Shenzhen is specifically mentioned in the national Five-Year Plan as a Science & Tech and industrial innovation centre.

Jiangsu province is to concentrate on IPR protection with an “international intellectual property protection demonstration platform”. In other locations, district governments have announced investment incentives, such as Pudong New Area District’s campaign to attract more multinational companies to set up their Asia Pacific headquarters.

The 13th Five-Year Plan: Business challenges

As part of the national commitment to economic restructuring, the 13th Five-Year Plan mentions a number of problematic (and long standing) business challenges, such as weak protection for intellectual property rights, and the cumbersome regulatory regime. The Plan calls for reduced bureaucracy, as well as better access to financing (particularly for the private sector), but does not give specific details. Indeed the role of the state in running the economy is still dominant: SOE reform is soft-pedalled, with the text emphasising the modernisation of SOE management and changes in the management of SOE assets. Meanwhile, localism will persist, despite the central government’s efforts to co-ordinate planning across provinces more effectively. The targeting of particular sectors and provision of subsidies inevitably means that local governments compete with each other for resources, giving rise to overcapacity and price wars. This has been discernible in the past in relation to sectors ranging from steel to solar—a pattern likely to be repeated in the coming years for emerging industrial areas such as cloud computing and semiconductors.

Tax reform is discussed in relatively broad measures, but with the exception of the value-added tax (VAT) roll-out, there is little in the way of specifics (China has replaced all business tax with VAT, with the final tranche in May 2016 for the construction, real estate, finance and consumer service sectors). The expansion of the VAT scheme is expected to ease tax burdens by more than RMB500bn this year. Environmental taxes are to increase, although full details are still awaited for a “Green Tax”, and a property tax is to be (eventually) adopted nationwide, although no deadline is discussed. Fiscal measures did contribute to the overall stimulus in the 2009-2010 period, and are likely to be called on again if required to boost economic growth: temporary tax cuts for car purchases were introduced in 2009, for cars with engines of less than 1.6 litres, and were reintroduced in late September 2015 to boost flagging auto sales. Changes to individual income tax rates (e.g. deductions for family burdens such as elder care) are reportedly being discussed within government think tanks, but have yet to materialise. Given that many local governments are likely to become increasingly fiscally stressed in 2016-20, the lack of detail on centre-local transfers or local government finance reform is a notable
absence from the plan. The viability of many local government-financed projects (and their ability to win central backing) is an issue that businesses will have to consider carefully.

Non-tariff barriers for foreign enterprises are likely to continue, in the form of required technology transfers, caps on foreign ownership or bids. Along with reforms and upgrades to broad industrial sectors, the 13th Five-Year Plan also identifies a number of ambitious engineering and technical projects beyond traditional national borders, notably in aerospace (new-generation heavy lift carrier rockets and satellite technology) as well as deep-sea exploration and seabed resources utilisation. Such strategically sensitive projects will be preserved for SOEs and other domestic conglomerates.

Are the 13th five-year plan targets achievable?

The determination to keep expansion above 6.5% per year until 2020 is a dangerously ambitious economic growth target. With China undergoing a structural downturn, sustaining this level of growth would require a significant degree of monetary and fiscal policy loosening, which would exacerbate imbalances in the economy and risk hastening a hard-landing. Our current forecast is that real GDP growth will average 5.3% a year in 2016–20. It remains to be seen whether striving to attain the politically symbolic “centennial” targets from China’s 13th Five-Year Plan will jeopardise the implementation of the nation’s overall economic reform agenda.
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For enquiries, please contact us at ecn_asia@economist.com
Or follow us on Twitter @ecn_asia