14th Five-Year Plans on Six Industries
Policy Update | December 2021

Following the release of the 14th Five Year Plan during the "two sessions" in March 2021, the Ministry of Industry and Information Technology (MIIT) and the Ministry of Human Resources and Social Security (MOHRSS) have released six industrial Five-Year Plans (hereinafter called FYPs):

- [Integrational Development of Information Technology and Industrialisation](#)

- [Information and Communication Technologies](#)

- [Software and Information Technology Service Industry](#)

- [Big Data](#)

- [Industrial Green Development](#)

- [Technical Worker Education](#)

The six FYPs highlight selected achievements of China's industrial development from the past five years, the 2021-2025 national objectives, and the current challenges for the industrial development in China. Apart from providing nation-wide industrial guidance, the FYPs also provide specific, quantifiable targets for the industry. This policy update summarises the six FYPs' key contents with a focus on the digital transformation of the manufacturing industry.

Integrational Development of Information Technology and Industrialisation

Key message: The major 2021-2025 industrial projects include advancing the digitalisation transformation of the manufacturing industry, promoting the Industrial Internet platform and industrial equipment cloud solutions, and upgrading the supply chain and the industrial chain.

The FYP identifies **two major industry trends**:

1. <u>The new generation of information technology accelerates innovation throughout the industry</u>

   Applications of Big Data, Artificial Intelligence and Blockchain trigger systemic, revolutionary technological breakthroughs and industrial changes.

2. <u>The global economic and trade environment is becoming more complex due to the pandemic</u>

   The Chinese industry is still focusing too much on low-value (over)production compared to high-tech outputs. The lacking ability to utilise technological innovation to achieve China's high-quality development targets remain a challenge for Chinese manufacturers.

The FYP's relevant **objectives and targets**:

- Promoting new business models and formats

  o Up to 80% penetration rate of digitalisation in business operations and management

  o Up to 85% penetration rate of digital R&D and design tools

  o Up to 68% numerical control rate of key processes

- Accelerating the industrial digital transformation of key industries such as raw materials, equipment manufacturing, consumer goods, electronic and information technology, green manufacturing, and safety production.

- Improving the integration support systems by upgrading the construction of new information infrastructure and improving the standard system for the integration of digitalisation and industrialisation.

- Stimulating enterprise integration and development
    - Up to 45% penetration rate of industrial Internet platforms
    - Enhancing service capabilities for providing systemic solutions

International Cooperation

The industry shall make full use of bilateral and multilateral cooperation mechanisms on the integrational development of digitalisation and industrialisation, Industrial Internet, open-source software, supply chain finance and other fields. Moreover, strengthening international standardisation and carrying out overseas distribution of intellectual property rights are also stressed. Finally, foreign-funded enterprises to set up Research and Development (R&D) institutions in China is encouraged.

Information and Communication Technologies

Key messages: Advancing ICT technologies is fundamental for maintaining China's network supply, ensuring network and data security and enabling internet functionality.

The FYP identifies **four weaknesses** in the development of the ICT industry:

1. Unbalanced regional development of information infrastructure still exists. International submarine cables, satellite communication networks and cloud computing facilities still need to be further developed for global deployment.

2. Integration and applications of ICT in production chains are not sufficient.

3. Legal and regulatory systems of the ICT industry need to be further improved.

4. Network security systems and capacities should be strengthened via continuous innovation.

The FYP stipulates **20 quantitative development targets** to be achieved by **2025**, e.g.

- Industry revenues shall be increased from 2.64 trillion CNY (approx. 367 billion EUR) to 4.3 trillion CNY (approx. 597 billion EUR).

- The investment on ICT infrastructure shall be raised from 2.5 to 3.7 trillion CNY (approx. 514 billion EUR).

- The 5G usage rate (i.e., 5G terminal connection number) shall be improved from 15% to 56%.

- The ratio of R&D investment to revenue of basic telecommunication enterprises should be increased from 3.6% to 4.5%.

The FYP's relevant **objectives**:

- Constructing new digital infrastructure
    - Fully deploying a new-generation communication network infrastructure

Accelerating 5G network coverage, fully deploying gigabit fibre-optic networks, enhancing IPv6 network service capacity, promoting comprehensive mobile IoT development, building a globally accessible information infrastructure (e.g., increasing overseas Cloud Computing data centres and Content Delivery Network nodes).

- o Developing a collaborative digital infrastructure

   Upgrading the Industrial Internet, accelerating the construction of platforms and Big Data centres, accelerating the application of Cellular Vehicle-to Everything (C-V2X) and carrying out demonstration pilots in cities.

- o Promoting energy conservation, emission reduction and green development

   Encouraging the use of Software Defined Networks/Network Function Virtualisation (SDN/NFV), AI and other technologies to promote the intelligent transformation of networked facilities for green upgrading.

- o Strengthening innovation and research of core technologies

   Increasing research and development support for network technologies, such as optical communications, millimetre wave, 5G enhancement, 6G development, quantum communications, Industrial Internet, and the Internet of Vehicles.

- Enhancing network and data security systems

  Formulating sectoral regulations on network data security in the ICT industry, establishing an industrial data classification protection mechanism, creating an industrial important data catalogue, setting industrial cross-border data transfer regulations. Improving the security rules of big data platforms, algorithms, and artificial intelligence technology applications. This FYP also proposes changes to the existing "Telecommunications Law". The formulation of relevant laws and regulations should be promoted in the areas of data ownership identification, data flow, exchange, and cross-border transfer.

- Strengthening coordination across regions and industries

  Strengthening and deepening international cooperation and exchange on standards, R&D, investment, and governance rules in areas such as 5G, 6G, AI and the Internet of Things.

International Cooperation

The FYP promotes the international cooperation on standards setting, R&D, investment and governance rules in the fields such as 5G, 6G, AI and Internet of Things.

Software and Information Technology Services

Key Message: High-quality development of software and technology services, upgrading of the industrial foundations and the modernisation of industry supply chains shall be prioritised.

The FYP identifies **five challenges**:

1. The industrial supply chain is fragile, and the products are in the middle and/or low end of the value chain.

2. The industry is not mature enough. Core technologies are in short supply.

3. The integration and application of software in various fields must be further developed.

4. The industrial ecosystem and international competitiveness need to be improved.

5. The development in selected areas, such as talent pools and intellectual property protection, needs to be better promoted.

The FYP's relevant development **objectives and targets**:

- Upgrading the industrial foundation
    - o Formulating 125 national standards in key areas
    - o Improving the capabilities of intellectual property services, engineering, quality management and value assurance
    - o Promoting a collaborative innovation system between the industry and enterprises
- Enhancing the industrial supply chain
    - o Improving the supply capacity of key software, such as basic software and industrial software
    - o Promoting software products that have strong impacts on emerging industries (e.g., software applications in finance and construction). Up to 1 million industrial Apps shall be developed
- Building up ecosystem capacities
    - o Cultivating several backbone enterprises with ecosystem leadership and core competitiveness
    - o Building 2-3 open-source communities with international influence
    - o Building 20 renowned Chinese software parks
    - o Improving the market-oriented pricing mechanism for software

International cooperation

The FYP supports enterprises to carry out in-depth cooperation in technology R&D, standard setting, product services and intellectual property rights. The plan encourages foreign companies and research institutions to set R&D and training centres, develop joint projects and invest in China.

Big Data

Key Message: The Big Data industry is a strategic emerging industry, which focuses on data generation, collection, storage, processing, analysis, and services.

By 2020, the Big Data industry reached an average annual compound growth rate of over 30% (over 1 trillion CNY/139 billion EUR in 2020). However, the FYP states that there are still gaps between the current development status in China vis-à-vis more advanced international benchmarks in the areas of basic hardware and software, open-source framework, and other key technologies. According to the plan, the Chinese market system is not sound and the security mechanisms are not well established.

The FYP's relevant development **objectives and targets**:

- Cultivating data market platforms
    - o Establishing basic systems and rules for property rights, exchange, cross-border transfer, and security of data resources.

- o Promoting the establishment of market mechanisms, encourage the participation of enterprises in the construction of exchange platforms and the exploration of data trading models.

- Enhancing Big Data advantages

    - o Accelerating industrial data aggregation, including promoting enterprises to carry out whole-process data collection, conducting national data resource surveys and establishing a national industrial foundation database.

    - o Building a secure and trusted data sharing space for the industry and other fields.

    - o Developing a collaborative cloud-side and end-to-end Big Data storage and calculation model.

- Reinforcing the industrial foundation
    - o Simultaneously developing and integrating the new-generation network and communication infrastructure, Industrial Internet, Internet of Vehicle, and smart grid.
    - o Developing an open-source community for Big Data to enhance technical research and market cultivation capabilities.
    - o Encouraging enterprises, universities, research institutes and industry organisations to actively participate in the development of international Big Data standards.
- Enhancing industrial Big Data value
    - o Building a multi-level industrial internet platform system to cultivate industrial Apps for niche scenarios.
    - o Supporting each industry to open the entire value chains' data flows and develop new data-driven business models.
    - o Building cross-sectoral industry data platforms for industries, such as communications, finance, and healthcare.
- Bolstering Security
    - o Promoting data security management mechanism, carrying out pilot projects on the security management of cross-border data transfer, and supporting regions with the conditions to innovate the management mechanism of cross-border data flow.
    - o Encouraging pilot areas to participate in international cooperation on setting digital rules.

International Cooperation

The industry shall take advantage of multilateral and bilateral international cooperation mechanisms. The Plan encourages multinational companies and research institutions to set up Big Data research and development centres as well as training centres in China. Active participation in the formulation of international rules and digital technology standards such as data security, digital currency and digital tax is also promoted.

Green Industrial Development

Key Message: Green technology innovation and entrepreneurial role should be strengthened to facilitate China's green industrial transition and help achieve carbon peak by 2030.

Selected green industrial development **achievements** from **2016-2020**:

- **An optimised industry landscape:** 3.3% and 1.9% increases in the share of high-tech and equipment manufacturers in the large-scale manufacturers' industrial added value respectively.

- **The preliminary set-up of low-carbon industries:** The output value of energy-saving and environment-conservation industries reached 7.5 trillion CNY (approx.1.04 trillion EUR) by 2020.
- **The basic establishment of a green manufacturing system:** 468 industrial standards for energy conservation and green industrial development, 2121 green factories, 171 green industrial parks, 189 green supply-chain enterprises, and almost 20.000 green products already exist.

The FYP identifies **three main challenges** for the **green industrial transition** in China:

1. From an industrial development perspective, there are still too many heavy industries, the energy provision still relies more on coal, and the industries are still relatively energy inefficient.
2. Technological capacities are not yet sufficient to fulfil carbon peak and carbon neutrality goals in time.
3. Recent requirement changes, such as carbon border adjustment, have exerted more pressure on China's trade with others.

The FYP's relevant development **objectives and targets**:

- 18% fewer CO_2 emissions per industrial added value

- 10% less waste from key industries

- 13.5% less energy consumption in relation to Chinese large-scale manufacturers' industrial added value.

- Reach a 57% utilisation rate of the commodity industry's solid waste.

- Further application of the basic green manufacturing system in key industries and zones; the green manufacturing industry output value shall reach 1.1 billion CNY (approx.153 million EUR)

The FYP's newly planned green industrial development construction projects include:

- low-carbon manufacturing pilot and demonstration projects,
- energy-efficient data centres,
- high-end intelligent manufacturing and resource-efficiency technologies.

Smart Manufacturing applications and technologies to be promoted:

- Industrial Internet, Big Data, and 5G are to be adopted for the smart management of energy provision, resource utilization and environmental protection.
- circular measures shall be taken to increase the manufacturing industry's resource efficiency.

<u>**International cooperation**</u>

This FYP encourages international cooperation on co-building green industrial parks, green factories, green supply chains, and low-carbon technology R&D platforms.

Technical Worker Education

Key Message: Throughout the process of industrial upgrading and technological changes, it is crucial to train talents in emerging sectors and to address the challenges of upskilling workers in traditional industries. Against this backdrop, this policy update specifically centres on intelligent manufacturing related trainings in this FYP.

The FYP stipulates **4 quantitative development indicators** to be achieved by **2025**, including:

- Training **two million high-skilled workers**

- Conducting **20 million skill development trainings for enterprise employees**

The FYP's relevant development **objectives**:

- **Promoting all-round vocational skills trainings**

  Organising technical colleges and universities to participate in training plans related to vocational skills development.

- **Organising technical education with relevant stakeholders**

  Leading enterprises and large-scale enterprises shall cooperate with education facilities. The formation of technical education groups from multiple enterprises and high-quality technical colleges shall be actively promoted.

- **Promoting school-enterprise cooperation**

  Encouraging technical colleges and enterprises to jointly develop high-quality educational resources and promote the development of the "Internet + education and training" model.

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