

# Chapter 4

## Reduction



### 4.1 Connotation and Origin of Reduction

The connotation of the reduction of the iron and steel industry means: China's economic development has entered into a new normal, with the economic growth showing medium and high speed, the industrial structure moving toward mid-to-high end and the shifting to new economic growth drives the consumption intensity of steel products per unit of GDP tends to decline, and the total steel consumption has entered a declining zone after the peak arc zone. Despite the fluctuations and repetitions, the general trend of reduction-based development has become quite clear, which will lead to decline in total energy consumption, total pollutant emission, and total resource consumption, have a far-reaching effect on the process restructuring, technical equipment structure, product structure, energy structure, resource structure, organizational structure, and industrial layout, and put forward new requirements for industrial development mode and development drives. And the "cutting overcapacity" through supply-side structural reform is a master key to recognizing, adapting, and leading the new normal of the reduction in the iron and steel industry. Therefore, from the perspective of "cutting overcapacity", the reduction of the iron and steel industry is elaborated mainly in two aspects: one is to eliminate backward production capacity and promote industrial upgrading; the other is to resolve excess capacity and help the industry to get out of trouble, which both refer to steel equipment and production capacity. The former focuses on equipment, while the latter focuses on production capacity, but the main subject is ironmaking and steelmaking equipment.

The elimination of backward production capacity of China's iron and steel industry has been implemented for a long time. As early as the mid-1950s, there was a discussion in Anshan Steel: "Is it better to have an open hearth furnace or a converter?" That debate lasted for decades. In 1963, China's first 30 t converter was put into operation in Shougang. After that, Benxi Steel and Panzhihua Steel also adopted converter steelmaking process. Compared with open hearth furnaces, oxygen converters showed powerful advantages in terms of tap-to-tap cycle, fuel consumption,

investment and operating costs, and product varieties. Therefore, the converter steel-making process was subject to a rapid development, which accelerated the elimination of open hearth furnaces.

In order to stop low-level redundant construction, speed up the restructuring pace, and promote the upgrading of production processes, equipment and products, the former State Economic and Trade Commission issued the *Catalogue of Eliminating Outdated Production Capacity, Processes, and Products (First Batch)* [1] in January 1999, which officially opened the prelude to the elimination of backward production capacity.

## 4.2 Reduction History of China's Iron and Steel Industry

The elimination of backward iron and steel production capacity in China can be roughly divided into the following four stages.

- (1) Initial stage (1999–2004): At this stage, the backward production processes of open hearth steelmaking were mainly eliminated in order to improve the technical level and production efficiency of steelmaking, and significantly reduce resource and energy consumption.
- (2) Promotion stage (2005–2009): At this stage, the backward production capacity of electric furnaces and converters of 20 t and below was mainly eliminated in order to carry out restructuring, upgrading and total quantity control of the iron and steel industry, improve the level of process technology and equipment, and implement clean production and sustainable development of the iron and steel industry.
- (3) Normalization stage (2010–2014): At this stage, the backward production capacity of blast furnaces below 400 m<sup>2</sup> and converters and electric furnaces of 30 t and below was mainly eliminated, while the certification criteria for backward equipment had not been enhanced, and the total quantity control and energy conservation and emission reduction had been carried out in a parallel way, with restructuring, transformation, and upgrading as the main directions and independent innovation and technological transformation as supports, to promote the transformation of the iron and steel industry from large to strong.

The focus of the first three stages of the reduction work was to eliminate the backward equipment and production capacity. The main means were taking volume and capacity as the certification criteria for backward equipment and adopting the “single solution” work mode for mandatory promotion. Although that work mode was controversial, the effect was more significant due to its higher operability.

- (4) Resolving stage (2015–2020): At this stage, the backward equipment elimination task with volume and capacity as the main criteria had been basically completed, and the reduction work of the iron and steel industry entered into the

new stage of supply-side structural reform to resolve excess capacity. The resolving stage is characterized by implementing more reasonable policy measures, emphasizing the compliance with laws and regulations, focusing on the combination of reduction and improvement as well as passiveness and activeness, which is expected to achieve a positive progress.

### **4.3 Analysis of the Measures and Their Effects on Reduction at Each Stage**

#### **4.3.1 Initial Stage (1999–2004)**

##### **1. Policy Measures**

In January 1999, the former State Economic and Trade Commission issued the *Catalogue for Eliminating Outdated Production Capacity, Processes, and Products (First Batch)* clearly classifying the open hearth furnaces as backward production process equipment to be completely eliminated by the end of 2000.

In December 1999, the former State Economic and Trade Commission issued the *Catalogue of Eliminating Backward Production Capacity, Processes, and Products (Second Batch)* [2] stipulating the elimination of converters of 10 t and below, side-blown converters, electric furnaces of 5 t and below as well as normal frequency furnaces for producing low-quality steel bar or open ingots before the end of 2000, and the elimination of the converters of 10–15 t (included), electric furnaces of 5–10 t (included) as well as cupola furnace steelmaking process before the end of 2002. That was the first time to classify the backward steelmaking process equipment according to their nominal capacity, which had promoted the improvement of the steelmaking process equipment level in China and played an important role in eliminating backward steelmaking capacity.

##### **2. Achievements**

In December 28, 2001, the steelmaking plant of Baotou Iron and Steel Company eliminated the last 500 t open hearth furnace for production, officially announcing that the open hearth steelmaking process had exited the historical stage, and also marking the end of the first step of eliminating backward production capacity. Its characteristic is that the innovation and upgrading of process technology have played a decisive role. The high efficiency and energy saving of the converter have promoted the voluntary elimination of outdated process equipment by enterprises and achieved the successful completion of the goal of eliminating backward production capacity.

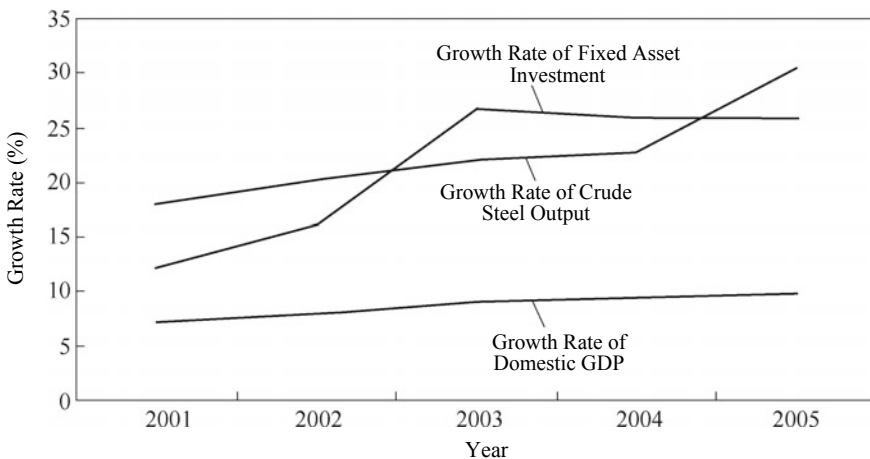
### 4.3.2 Active Promotion Stage (2005–2009)

Since 1996, China's crude steel output has been ranked first in the world. By 2005, the crude steel output and production capacity exceeded 300 million tons [3] and 400 million tons, respectively, continuously marking a record high. The gross domestic product (GDP), fixed asset investment, and crude steel output growth rate of China during the 10th Five-Year Plan are shown in Fig. 4.1. The rapid growth of crude steel output had not only met the needs of national economic and social development, but also brought massive consumption of resources and energy. In particular, China's iron and steel industry was subject to a low level, repeated construction, low industrial concentration as well as a large gap with international advanced levels in terms of technical level and material consumption. Moreover, because of low added value of products and low comprehensive competitiveness of enterprises, the situation of being big but not strong had lasted for a long time. Therefore, it must change the development model of the iron and steel industry and achieve its sustainable development through the elimination of backwardness, technological upgrading, and restructuring.

#### 1. Policy Measures

Since 2005, the state has successively issued a series of policies and documents on eliminating backward production capacity to define backward production capacity and vigorously promote their elimination.

- (1) *The Development Policy for Iron and Steel Industry* promulgated by the National Development and Reform Commission [4] in July 2005 pointed out that China would speed up the elimination and prohibit the construction of backward technological equipment such as blast furnaces and electric furnaces



**Fig. 4.1** Growth rate of GDP, fixed asset investment, and crude steel output in China during the 10th Five-Year Plan (unit: %)

- of 300 m<sup>3</sup> and below, iron melting-based steelmaking facilities, converters, and electric furnaces of 20 t and below, and medium frequency induction furnaces.
- (2) *The Catalogue of Industrial Restructuring Guidance* (2005 Edition) (No. 40 Order of NDRC in 2005) promulgated by the National Development and Reform Commission in December 2005 [5] again listed the normal frequency and medium frequency induction furnaces for producing low-quality steel bar, ingots or casting billets, the iron melting-based steelmaking facilities, converters of 15 t and below (excluding ferroalloy converters) as well as electric furnaces of 10–20 t (excluding electric furnace for mechanical casting) into the catalogue to be eliminated immediately; the converters of 10 t and below (excluding ferroalloy converters) and electric furnaces of 10–20 t and below (excluding electric furnace for mechanical casting) into the catalogue to be eliminated by the end of 2005; the converters of 20 t and below (excluding ferroalloy converters), electric furnaces of 20 t and below (excluding electric furnaces for high-alloy steel and mechanical casting) into the catalogue to be eliminated by the end of 2006; and the blast furnaces of 200–300 m<sup>3</sup> (included) into the catalogue to be eliminated by the end of 2007.
  - (3) *The Decision of the State Council on Issuing and Implementing the Interim Provisions on Promoting Industrial Restructuring* promulgated in December 2005 (No. 40 of the State Council in 2005) [6] pointed out to limit and eliminate backward production capacity and prevent blind investment and low level repeated construction, and effectively promote the optimization and upgrading of industrial structure. For the eliminated projects, the investment shall be prohibited, and all regions, departments, and related enterprises must take effective measures and eliminate them within the prescribed time limit. For those who fail to complete elimination as scheduled, the local governments at various levels shall order them to suspend production or shut down them according to relevant state laws and regulations.
  - (4) *The Notice on Accelerating the Restructuring of Overcapacity Industries* promulgated in March 2006 (No. 11 of the State Council in 2006) [7] first put forward that there was a significant excess of iron and steel production capacity, and the contradiction between resource and environmental constraints was conspicuous; thus, restructuring must be carried out. It shall give play to the basic role of resources allocation by the market, make full use of the power of the market to drive competition and promote the survival of the fittest, formulate more stringent standards for environment, safety, energy consumption, water consumption, comprehensive utilization of resources, quality, technology, scale, etc., to advance access thresholds. Through restructuring, transformation, and elimination, the pace of restructuring would be accelerated, and blast furnaces of less than 300 m<sup>3</sup> and converters and electric furnaces of less than 20 t would be eliminated.
  - (5) *The Notice on Controlling Total Quantity, Eliminating Backwardness and Accelerating the Restructuring of the Iron and Steel Industry* issued in June 2006 (No. 1084 of NDRC in 2006) [8] pointed out that the capacity of small converters and electric furnaces of 20 t and below shall be 55 million tons

among the steel production capacity of 420 million tons formed at the end of 2004, accounting for 13.1% of the total capacity; and it also clearly defined that backward capacity of converters and electric furnaces of 20 t and below would be mainly eliminated before 2007.

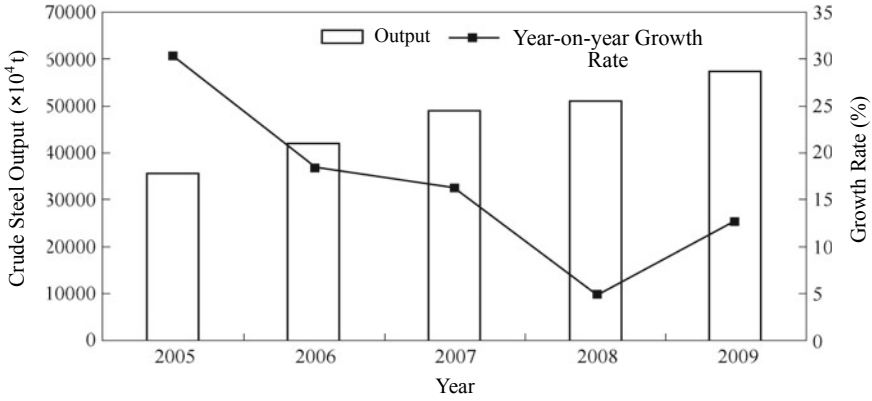
- (6) *The Notice of the State Council on Printing and Distributing the Comprehensive Work Plan for Energy Conservation and Emission Reduction* promulgated in June 2007 (No. 15 of the State Council in 2007) [9] pointed out that energy conservation and emission reduction should be the focus of the macroeconomic regulation and control at that time and the breakthrough point and main fulcrum for economic restructuring and growth mode transformation to resolutely inhibit the excessive growth of high energy consumption and high-pollution industries, strictly control the construction of new high energy consumption and high-pollution projects, and devote more efforts to eliminate backward production capacity in power and iron and steel industries. The Notice was also attached with a list of the eliminated backward production capacity during the 11th Five-Year Plan, which quantified the elimination of outdated equipment and clearly pointed out the elimination of backward ironmaking and steelmaking capacity of 100 million tons and 55 million tons, respectively, during the 11th Five-Year Plan, including elimination of 30 million tons and 35 million tons, respectively, by the end of 2007.
- (7) *The Notice of the National Development and Reform Commission on the Work of Shutting Down and Eliminating Backward Production Capacity in the Iron and Steel Industry* issued in October 2007 (No. 2761 of NDRC in 2007) required that, in response to some problems, the elimination standards of backward iron and steel production capacity shall be strictly implemented; backward equipment must not avoid elimination by means of transformation from elimination category into limited one; the certification for Dismantling Backward Iron and Steel Production Capacity and Equipment shall be issued; and the law enforcement and verification should be enhanced, so as to ensure the actual implementation of the shutdown and elimination of backwardness.
- (8) *The Notice of the National Development and Reform Commission on the Strict Prohibition of the Transfer of Backward Production Capacity* issued in October 2007 (No. 2792 of NDRC in 2007) pointed out that the production process technology, equipment, and products that were explicitly eliminated by the state should not be imported, transferred, produced, sold, used or applied, and backward production capacity should not be transferred. Moreover, backward equipment and facilities should be completely abolished to resolutely prevent the outflow of backward production capacity. Backward process equipment that could not be transformed or upgraded must be eliminated. The list of enterprises that had eliminated backward process equipment should be announced on the local major media and submitted to the public for supervision.
- (9) *The Plan for Restructuring and Revitalization of the Iron and Steel Industry* promulgated in March 2009 (No. 6 of the State Council in 2009) [10] clearly required that new production capacity should be strictly controlled; the steel projects simply for new production capacity or expansion be not approved or

supported; and all projects must be based on the elimination of backwardness. By the end of 2010, the eliminated production capacity of blast furnaces of 300 m<sup>3</sup> and below was 53.4 million tons, and that of converters and electric furnaces of 20 t and below was 3.2 million tons; by the end of 2011, the blast furnaces of 400 m<sup>3</sup> and below, and the converters and electric furnaces of 30 t and below were eliminated, corresponding to the elimination of backward ironmaking capacity of 72 million tons and backward steelmaking capacity of 25 million tons. In regions where large steel plants are built based on the elimination of backward production capacity and those where conditions permit, it was planned to raise the criteria to eliminate the backward production capacity of blast furnaces of 1,000 m<sup>3</sup> and below and corresponding steelmaking capacity.

- (10) *The Notice of the State Council on the Approval of the Options about the Suppressing Overcapacity in Some Industries and Repeated Construction to Guide the Healthy Development of the Industries submitted by the Development and Reform Commission and Other Departments* (No. 38 of the State Council in 2009) [11] issued in September 2009 pointed out that, making full use of the pressure by market forces to accelerate the structural adjustment and technological progress by eliminating backwardness, joint restructuring and relocation of urban steel plants, under the premise of reducing or not increasing production capacity, so as to promote the transformation of the iron and steel industry from largeness to mightiness. The steel projects simply for new capacity and capacity expansion would no longer be approved and supported. It was strictly forbidden various regions to build steel projects on their own by avoiding the supervision and approval of the national environmental protection, land and investment authorities in the name of eliminating backward production capacity. By the end of 2011, the blast furnaces of 400 m<sup>3</sup> and below, and the converters and electric furnaces of 30 t and below were resolutely eliminated.
- (11) In November 2009, the Ministry of Industry and Information Technology issued the *Notice on Splitting and Implementing the Task of Eliminating Backward Production Capacity in 2009*, which pointed out that, by the end of 2009, it plans to eliminate backward ironmaking and steelmaking capacity of 21.13 million tons and 16.91 million tons, respectively, over the country, of which the task of eliminating backward production capacity was arduous for Jiangsu Province and Hebei Province.

## 2. Achievements

That stage was the period in which China's iron and steel industry had developed at the highest speed, the energy conservation and emission reduction had achieved remarkable results, and the iron and steel industry had effectively met the needs of economic and social development. The state's policy measures on eliminating backwardness had been steadily advanced, and the elimination of backwardness had achieved certain results.

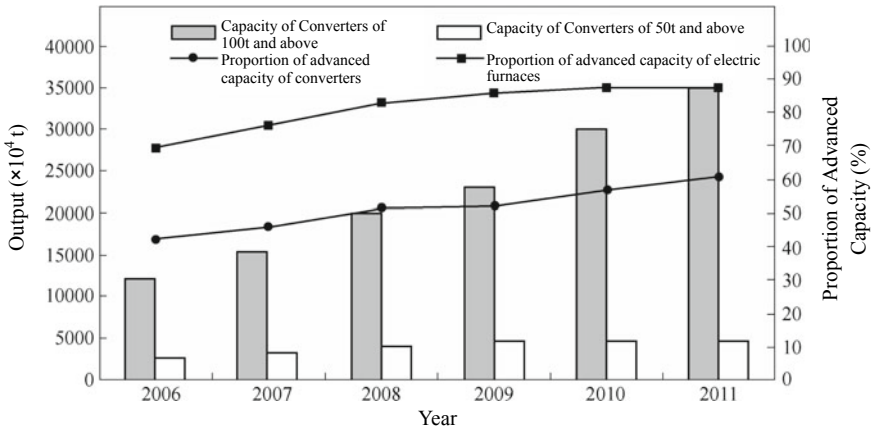


**Fig. 4.2** Status and growth rate (%) of China's crude steel output (unit: 10,000 t) from 2004 to 2009

- (1) Crude steel output continued to grow, but the growth rate slowed down significantly. China's crude steel output growth rate dropped sharply from 30.4% in 2005 to 12.6% in 2009 with a decrease of 17.8%. During that period, the growth rate of crude steel production capacity decreased from 24.6% to 11.4% with a drop of 12.2%, and the crude steel output utilization rate was maintained within a reasonable range of 80% or more (up to 89.1% in 2006), as shown in Fig. 4.2.
- (2) The technical level of steelmaking equipment had been significantly improved. The converters and electric furnaces of 20 t and below had been basically eliminated. During the 11th Five-Year Plan, the proportion of large-scale steelmaking equipment in key large- and medium-sized iron and steel enterprises in China had been significantly improved. The converters of 100 t and above and the ultra-high-power electric furnaces of 50 t and above had basically reached the advanced level of similar equipment abroad. The proportion of advanced production capacity had been continuously improved, and they had become the main equipment for steelmaking production in China, as shown in Fig. 4.3.
- (3) The energy conservation and emission reduction had achieved remarkable results. In 2010, the energy conservation and emission reduction indexes of key iron and steel enterprises included in the statistics were improved comprehensively. The comprehensive energy consumption per ton of steel fell to 605 kg of standard coal; the consumption of freshwater was reduced to 4.1 m<sup>3</sup>; and the sulfur dioxide emissions were reduced to 1.63 kg, a reduction of 12.8%, 52.3%, and 42.4%, respectively, compared to those in 2005. The comprehensive utilization rate of solid waste was increased from 90% to 94%.

During that period, due to the lack of effective assessment methods for the elimination of backward production capacity, together with the strong drive by market demand, enterprises mainly aimed at guaranteeing production and increasing production, and their enthusiasm for eliminating backward production capacity was not





**Fig. 4.3** Changes in China’s steelmaking capacity during the 11th Five-Year Plan (unit: 10,000 t, %)

strong; thus, the capacity replacement was basically stopped, and the overall progress of eliminating backward production capacity was slow.

### 4.3.3 Standardization Stage (2010–2014)

#### 1. Policy Measures

The “12th Five-Year Plan” period was a period for standardizing the elimination of backward production capacity. As the state further strengthened the efforts to eliminate backward production capacity, relevant supporting measures such as the assessment methods for elimination of backward production capacity and the incentive central financial funds had been successively introduced, and great attentions were paid to resolving excess production capacity, especially the issuance of the Notice of the State Council on Further Strengthening the Work of Eliminating Backward Production Capacity (No. 7 of the State Council in 2010) was of epoch-making significance in the elimination of backward production capacity, resulting in substantial achievements in eliminating backward production capacity.

- (1) *The Notice of the State Council on Further Strengthening the Work of Eliminating Backward Production Capacity* (No. 7 of the State Council in 2010) [12] issued in February 2010 pointed out that, it must give full play to the role of the market, adopt more effective measures, and comprehensively apply law, economy, technology, and necessary administrative means to further establish and improve a long-term mechanism to eliminate backward production capacity, so as to ensure the targets of eliminating backward production capacity are achieved on schedule.

- (2) *The Notice of the State Council on Further Efforts to Ensure the Realization of the Energy Conservation and Emission Reduction Targets During the 11th Five-Year Plan* (No. 12 of the State Council in 2010) promulgated in May 2010 required to enhance the elimination of backward production capacity to eliminate backward ironmaking and steelmaking capacity by 25 million tons and 6 million tons, respectively, in 2010.
- (3) *The Opinions of the General Office of the State Council on Further Strengthening Energy Conservation and Emission Reduction to Accelerate the Structural Adjustment of the Iron and Steel Industry* (No. 34 of the State Council in 2010) promulgated in June 2010 pointed out: improving the withdrawal mechanism of backward production capacity and giving full play to the basic role of market in allocating resources, enhancing strict tax collection and management, cleaning up and correcting local tax incentives for iron and steel enterprises, and striving to create a market environment that promotes fair competition between enterprises and withdrawal of backward production capacity; improving and implementing policies on land use and differential electricity price, enhancing the implementation of differential electricity prices, substantially increasing the price increase standard for differential electricity prices, and further increasing the production costs of backward production capacity.
- (4) In June 2010, the Ministry of Industry and Information Technology issued the *Regulations on the Production and Management of the Iron and Steel Industry*, which put forward clear requirements for the product quality, environmental protection, energy consumption, comprehensive utilization of resources and process equipment of iron and steel enterprises, and required that environmental protection, energy consumption and equipment level rather than only equipment level shall be taken into account in the elimination of backward production capacity.
- (5) In October 2010, the *Guidance Catalogue for the Elimination of Outdated Production Process Equipment and Products in Some Industrial Sectors* (2010 Edition) issued by the Ministry of Industry and Information Technology further clarified that the blast furnaces of 300 m<sup>3</sup> and below, the steelmaking converters and electric furnaces of 20 tons and below, the normal frequency and medium frequency induction furnaces for producing low-quality steel bar and carbon steel (excluding steel ingots for mechanical casting) as well as the electric furnaces of 5,000 kVA and below for producing high-alloy steel must be eliminated before the end of 2010; the blast furnaces above 300 m<sup>3</sup> but not exceeding 400 m<sup>3</sup> and the steelmaking converters and electric furnaces above 20 tons but not exceeding 30 tons must be eliminated before the end of 2011.
- (6) In January 2011, eighteen departments including the Ministry of Industry and Information Technology and the National Development and Reform Commission jointly issued the *Notice on Printing and Distributing the Implementation Plan for the Elimination of Backward Production Capacity* (No. 46 of Ministry of Industry and Information Technology in 2011), which clearly defined that the evaluation, assessment, reward, and punishment system for job objective

responsibility on elimination of backward production capacity shall be established and improved according to the general requirements of clear objectives, sound organization, responsibilities in place, measures in place, supervision in place and level-by-level evaluation, and the responsibilities of local governments and enterprises shall be implemented, so as to ensure the successful completion of the goal of eliminating backward production capacity.

- (7) *The Outline of the Twelfth Five-Year Plan for National Economic and Social Development of the People's Republic of China*, promulgated in March 2011, stated that the metallurgical industry should base itself on domestic demand, strictly control aggregate expansion, optimize variety structure, and make new progress in product R&D, comprehensive utilization of resources, energy conservation and emission reduction, etc. The elimination of backward production capacity shall be enhancing, and excess capacity shall be reduced and diverted.
- (8) *The Guidance Catalogue for Industrial Structure Adjustment* (2011 Edition) issued by the National Development and Reform Commission in March 2011 once again pointed out that the normal frequency and medium frequency induction furnaces for producing low-quality steel bar, carbon steel and stainless steel, the converters of 30 tons and below (excluding ferroalloy converters), the electric furnaces of 30 tons and below (excluding mechanical casting furnaces) and steelmaking process by means of iron melting must be eliminated before the end of 2011. Meanwhile, the *Guidance Catalogue for Industrial Structure Adjustment* (2005 Edition) was abolished.
- (9) In October 2011, the *Twelfth Five-Year Development Plan for the Iron and Steel Industry* was officially released, which clearly pointed out that it should further promote energy conservation and emission reduction, reduce the energy consumption, carbon dioxide emission and water consumption per unit added value in iron and steel enterprises according to the general requirements of national energy conservation and emission reduction and local decomposed task indicators, and decrease the total sulfur dioxide emissions. At the same time, it pointed out that it should continue to strengthen the elimination of backward production capacity, and resolutely eliminate the normal frequency and medium frequency induction furnaces for low-quality steel bar and carbon steel (excluding steel ingots for mechanical casting), the steelmaking converters of 30 tons and below, the steelmaking electric furnaces of 15,000 kVA and below (30 tons and below), high-alloy electric furnaces of 5,000 kVA and below (nominal capacity of 10 tons and below) as well as other backward production capacity.
- (10) In December 2011, the State Council issued the *Industrial Transformation and Upgrading Plan (2011–2015)* (No. 47 of the State Council in 2011), which clearly required to control newly added capacity and general expansion, as well as improve the overall quality of the iron and steel industry from aspects of technical transformation and modification, backwardness elimination, mergers and acquisitions and circular economy.
- (11) In October 2013, the State Council issued the *Guidance on Resolving the Contradictions of Serious Overcapacity* (No. 41 of the State Council in 2013),

which proposed “digesting a batch, transferring a batch, integrating a batch, and eliminating a batch” of excess capacity. Through five years of hard work, the total production capacity of the iron and steel industry shall be compatible with environmental carrying capacity, market demand, and resource guarantee. The layout shall be coordinated with the regional economic development. The total capacity of reduced iron and steel production shall be over 80 million tons, and the capacity utilization rate shall reach a reasonable level.

- (12) In December 2013, the State Council issued the *Government-approved Catalogue of Investment Projects (2013 Edition)* (No. 47 of the State Council in 2013), which required that, for the projects in the industries with severe overcapacity such as steel and electrolytic aluminum, relevant departments of the State Council and the local governments should strictly control the newly increased production capacity in accordance with the requirements of the guidance on resolving the contradiction of severe excess capacity.
- (13) In November 2014, the State Council issued the *Government-approved Catalogue of Investment Projects (2014 Edition)* (No. 53 of the State Council in 2013), which implemented the filing system for investment projects in the iron and steel industry, which were no longer included in the approved catalogue. It required to strictly implement the No. 41 document of the State Council in 2013 for the iron and steel projects, and work together to promote the resolution of the contradiction of serious excess capacity.

## 2. Achievements

Under the unified arrangement and leadership of the Party Central Committee and the State Council, the members of the Inter-Ministerial Coordination Group for the Elimination of Backward Production Capacity had effectively cooperated, gradually established a work system, continuously improved policy measures, and achieved substantial progress in eliminating backward production capacity, which optimized industrial structure, promoted energy conservation and emission reduction, effectively driven up the transformation and upgrading of the iron and steel industry.

- (1) Alleviated contradiction of excess capacity. From 2010 to 2014, the eliminated ironmaking capacity was 118 million tons and eliminated steelmaking capacity was 89.66 million tons [13]. The timely elimination of those backward production capacity had alleviated the contradiction of excess capacity to some extent and promoted industrial restructuring and energy conservation and emission reduction, and reserve spaces regarding land, energy, resources, market space and environmental capacity for local development.
- (2) Optimized industrial structure. In the coking industry, the most small coke ovens with a coking chamber height less than 4.3 m haven been eliminated. The production capacity ratio of large advanced coke ovens with a coking chamber height of 5.5 m and above has increased from 30% to 40%. In the iron and steel industry, the production capacity ratio of blast furnaces of 1000 m<sup>3</sup> and above has been increased from 33% to 50% only in Shandong Province.

- (3) Enhanced industrial energy conservation and emission reduction. Since 2010, a large number of outdated equipment featuring high energy consumption and high emissions have been eliminated, which directly promoted industrial energy conservation and emission reduction. According to the calculation by Sichuan Provincial Energy Conservation Supervision Center, since 2010, the accumulated elimination of backward production capacity in Sichuan Province has exceeded the energy-saving capacity of more than 10 million tons of standard coal, which make about 30% contribution for achieving the province's industrial energy-saving target. Eliminating backward production capacity has become an important support and means for achieving the targets of energy conservation and emission reduction around China.
- (4) A long-term mechanism for eliminating backward production capacity has been established and improved.

The first is to establish an organizational coordination and implementation system. An Inter-Ministerial Coordination Group for the Elimination of Backward Production Capacity led by seventeen departments including the Ministry of Industry and Information Technology, the National Development and Reform Commission, the Ministry of Supervision, and the Ministry of Finance was established to study and solve major problems and coordinate the overall work. All local governments have also set up coordination (leadership) teams with provincial government leaders or heads of leading departments as team leaders and participated by responsible personnel of relevant departments to decompose and implement the objectives and tasks, clarify the division of responsibilities, formulate work plans, and promote the elimination of backward production capacity under unified leadership.

The second is to improve award and incentives policies and measures. The Ministry of Industry and Information Technology, the Ministry of Finance, and the Energy Bureau have formulated the *Measures for the Management of Central Financial Incentive Funds for Eliminating Backward Production Capacity*. In accordance with the principle of "rewarding on those who have eliminated backward production capacity on time or in advance", an annual reward threshold has been set to guide enterprises to actively eliminate the backward production capacity, and thus a working mechanism that links the reward funds with the elimination target tasks, which has strongly supported the work carried out in various places.

The third is to comprehensively apply legal means, economic means, and necessary administrative means. The Ministry of Industry and Information Technology has formulated the *Guidance Catalogue for the Elimination of Outdated Production Process Equipment and Products in Some Industrial Sectors* (2010 Edition), which clearly defines the standards of judgment and clarifies the elimination period. The Ministry of Industry and Information Technology and the State Electricity Regulatory Commission have jointly issued the *Notice on Further Strengthening the Supervision of Power Energy Conservation and Emission Reduction and Doing a Good Job in Eliminating Backward Production Capacity* to urge power supply enterprises to do a good job in cutting off or limiting power supply in accordance with the laws to prevent the resurgence of backward production capacity. Relevant departments

have increased enforcement regarding land use, environmental protection, production licenses, industrial and commercial registration, etc., in order to standardize market fair competition and promote backward production capacity to be eliminated through market competition.

The fourth is to establish inspection, assessment, and supervision mechanisms. With the approval by the State Council, the members of the Inter-Ministerial Coordination Group have formulated the *Implementation Plan for the Assessment of Elimination of Backward Production Capacity*, which incorporates the completion of the target tasks into the local government's performance assessment system, so as to improve the urgency and execution ability of local governments.

The fifth is to play the supervision role of social media. After the target tasks were given, the Ministry of Industry and Information Technology, the provincial (district, municipal) governments, and industrial and information administration departments, respectively, announced to the public on the official Web site and mainstream media the list of enterprises that had eliminated backward production capacity, outdated equipments and backward production capacity have been removed; after the equipment was dismantled, the situation was announced to the public again. The supervision role of the society and the media was fully played to further ensure the implementation of the target tasks and policy measures.

#### **4.3.4 Resolving Stage (2015–2020)**

##### **1. Basic Judgment**

By the end of 2014, the production capacity ratio of blast furnaces of 400 m<sup>3</sup> and below in the iron and steel industry was about 1%, and that of converters of 30 tons and below was 0.6%. The industrial structure was optimized, and the equipment level had been significantly improved. The elimination task of outdated equipment identified by volume and capacity standards had been basically completed, and the reduction work of iron and steel industry had entered a new stage of removing excess capacity.

##### **2. Background**

As early as 2013, the *Guiding Opinions on Resolving the Contradictions of Severe Excess Capacity* (No. 41 of the State Council in 2013) proposed to reduce the total steel production capacity by more than 80 million tons through “four batches” (i.e., digesting a batch, transferring a batch, integrating a batch and eliminating a batch). And the volume and capacity of outdated equipment were not mentioned therein.

In June 2015, the National Development and Reform Commission and the Ministry of Industry and Information Technology issued the *Notice on Printing and Distributing the Opinions on Cleaning Up Illegal Projects in Iron and Steel, Electrolytic Aluminum and Shipbuilding Industries* (No. 1494 of NDRC and MIIT in

2015), which gave specific opinions on the illegal projects that were under construction or had been completed, and required that the main responsibility should be properly undertaken, and the excess capacity should be removed unswervingly.

In November 2015, the 11th meeting of the Central Financial and Economic Leading Group put forward the proposal of “supply-side structural reform” to promote the same. It is a major innovation that adapts to and leads the new normal of economic development, and the key for the transformation of economic development mode and the strategic adjustment of economic structure. To solve the deep-seated structural contradictions and problems in the current economic and social development, efforts must focus on the supply-side structural reform. The main purpose of supply-side structural reform is to release new demands and create new supplies. The Central Economic Work Conference made it clear that the primary task for 2016 was to actively and steadily resolve excess capacity. The purpose was to free precious resources from those industries with severe excess capacity and limited growth space and “zombie companies”, so as to streamline supply, increase effective supply, and create new productivity.

Therefore in February 2016, the State Council issued the *Opinions on Resolving the Excessive Capacity of the Iron and Steel Industry to Realize the Development Out of Difficulties* (No. 6 of the State Council in 2016) [14], which required a focus on promoting the supply-side structural reform of the iron and steel industry based on the principles of acting under the pressure of marketing forces, enterprises as main bodies, organization by local governments, support from central government, highlighting key points, complying with laws and regulations, comprehensively applying market mechanisms, economic means and legal means, adapting to local conditions, applying policies by categories, and treating both the symptoms and the root causes, in order to actively and steadily resolve excess capacity, and it also proposed to reduce the crude steel production capacity by 100 million to 150 million tons in 5 years by means of withdrawal according to laws and regulations and initiative withdrawal under guidance.

Document No. 6 issued by the State Council in 2016 was an important regulation after the reduction of China’s iron and steel industry entering into the resolving stage, and the whole industry has entered the substantive operational stage of resolving excess steel capacity.

### 3. Supporting Policies

The supporting policies of the document No. 6 issued by the State Council in 2016 were very comprehensive, and eight special supporting policy documents were formulated, respectively, by the Ministry of Finance, the Ministry of Human Resources and Social Security, the Ministry of Land and Resources, the Ministry of Environmental Protection, the People’s Bank of China, the State Administration of Taxation, the General Administration of Quality Supervision, Inspection and Quarantine, the State Administration of Work Safety, the China Banking Regulatory Commission, and the Coal Supervision Bureau in respects of financial and taxation support, staff resettlement, land, environmental protection, quality and safety, namely

- Opinions of the Ministry of Land and Resources on Supporting the Iron and Steel Industry to Resolve Excess Capacity to Realize the Development Out of Difficulties (No. 3 of MLR in 2016)
- Opinions of the Ministry of Environmental Protection, the National Development and Reform Commission and the Ministry of Industry and Information Technology on Supporting the Iron and Steel Industry to Resolve Excess Capacity to Realize the Development Out of Difficulties (No. 47 of MEP in 2016)
- The Opinions of the Seven Departments including the Ministry of Human Resources and Social Security on Doing a Good Job in Staff Relocation in the Process of Resolving the Excess Capacity of the Iron and Steel Industry to Realize the Development Out of Difficulties (No. 32 of Ministry of Human Resources and Social Security in 2016)
- Opinions of the General Administration of Quality Supervision, Inspection and Quarantine on Resolving the Excess Capacity of the iron and steel industry to Realize the Development Out of Difficulties (No. 193 of General Administration of Quality Supervision, Inspection, and Quarantine in 2016)
- Opinions of the State Administration of Work Safety and the State Administration of Coal Mine Safety on Supporting the Iron and Steel Industry to Resolve the Excess Production Capacity to Realize the Development Out of Difficulties (No. 38 of SAWS and SACMS in 2016)
- Opinions of the Ministry of Finance and the State Administration of Taxation on Resolving the Excess Capacity of the Iron and Steel Industry to Realize the Development Out of Difficulties (No. 151 of the Ministry of Finance in 2016)
- Opinions of the People’s Bank of China, the China Banking Regulatory Commission, the China Securities Regulatory Commission, and the China Insurance Regulatory Commission on Supporting the Iron and Steel Industry to Resolve Excess Capacity to Realize the Development of Deprivation (No. 47 of the People’s Bank of China in 2016)
- Notice of the Ministry of Finance on Printing and Distributing the Measures for the Management of Supplementary Funds for Structural Adjustment of Industrial Enterprises (No. 253 of the Ministry of Finance in 2016).

Among them, document No. 253 issued by the Ministry of Finance in 2016 pointed out that the central government would actively support the iron and steel and coal industries to cut overcapacity. The main measures include the establishment of a special fund for structural adjustment of industrial enterprises by the central government, with a total scale of 100 billion yuan; the implementation of relevant tax preferential policies for the iron and steel and coal industries continued the implementation of the steel export tax refund policy, such as the abolition of imported steel bonded tax under processing trade, the implementation of tax incentives for the comprehensive utilization of resources through waste heat recovery power generation by iron and steel enterprises; the implementation of fiscal and taxation accounting support policies for steel and coal enterprises’ restructuring and bankruptcy, including tax incentives, land transfer income policies, and financial accounting systems; the implementation of financial policies for steel and coal enterprises to resolve excess capacity, support



financial enterprises to dispose of non-performing assets in a timely manner, support eligible projects through special construction funds, and support iron and steel, coal and other industries to “go abroad” through export credit insurance.

#### 4. Achievements

In February 2016, the State Council issued the *Opinions on Resolving the Excess Capacity of the Iron and Steel Industry to Realize the Development Out of Difficulties* (No. 6 of the State Council in 2016) and then the Ministry of Finance, the Ministry of Human Resources and Social Security, the Ministry of Land and Resources, the Ministry of Environmental Protection, and other central ministries and commissions issued a series of supporting documents, which formed a complete “1 + 8” policy system for cutting overcapacity. At the same time, a number of special actions were launched, such as “eliminating backward production capacity”, “eliminating construction projects”, and “energy consumption inspection”. Under the great attention and unified deployment of the Party Central Committee and the State Council, leading by the central ministries and commissions, cooperation by local governments at all levels, and participation and joint work by industry associations, enterprises, consulting agencies and other parties, the crude steel production capacity was reduced by 65 million tons in 2016, exceeding the established target of 45 million tons by 44.4%.

Not only 201,000 employees have been resettled stably and orderly, and the industry’s operating conditions had been improved (in 2016, the total profit of the members of the China Iron and Steel Association was 30.3 billion yuan, turning losses into profit, marking a profit increase of about 108.3 billion yuan compared with that in 2015); meanwhile, the industry transformation and upgrading had been promoted. Not only Baosteel and Wuhan Steel were merged as Baowu Iron and Steel Group Co., Ltd. to build a steel aircraft carrier with strong international competitiveness through strong joint and optimized structure, but also the restructuring of other enterprises (Anshan Steel and Benxi Steel) is under research and in progress. In addition, the fair competition of the market order has been initially restored, effectively curbing the unfair market order of “bad money drives out good”.

In February 2017, China Iron and Steel Association issued the *Opinions on Supporting the Strike Against “Substandard Steel” and Defining the Range of Power Frequency and Medium Frequency Induction Furnaces* (No. 23 of CISA in 2017), which clearly specified the definition criteria for “substandard steel” produced by medium frequency induction furnaces. In April, the inter-ministerial joint meeting for resolving excess capacity of iron and steel and coal industries to realize the development out of difficulties under the leadership of the National Development and Reform Commission issued the *Opinions on Resolving the Excess Capacity of the Iron and Steel and Coal Industries to Realize the Development Out of Difficulties in 2017* (No. 691 of NDRC in 2017), which clearly clarified the key tasks of cutting overcapacity in 2017, such as resolutely banning “substandard steel” and continuing to reduce the crude steel production capacity by 50 million tons.

From the release of document No. 6 by the National Development and Reform Commission in 2016 to the end of October 2017, the target of cutting overcapacity

by 115 million tons was successfully completed, accounting for more than 80% of the target of 140 million tons during the 13th Five-Year Plan period. At the same time, more than 700 enterprises producing “substandard steel” had been completely eliminated, involving over 100 million tons of production capacity.

Meanwhile, in terms of production capacity structure, the utilization rate of crude steel production capacity had rebounded sharply and gradually returned to a reasonable range. In terms of organizational structure, the crude steel output CR10 in 2016 was 35.87%, an increase of 1.69% over 2015. From January to May 2017, the crude steel output CR10 was 35.76%, which was basically the same as that in 2016. In terms of layout structure, blast furnace No. 2 at the Zhanjiang Iron and Steel Project of Baowu Group was completed and put into operation in July 2016, coastal projects like Shougang Jingtang Project Phase-II and Tangshan Bohai Steel Group were under construction, and the relocation projects of Jinan Steel (which had achieved full production shutdown in July 2017) as well as Taihang Steel in Wu’an, Jinan Steel and Shijiazhuang Steel in Hebei Province were in progress; in terms of product structure, compared with 2015, the proportion of long products decreased by 2.5% from January to May 2017, the proportion of sheet and strip products increased by 3.3%, and the proportion of pipes decreased by 0.6%. In particular, the elimination of “substandard steel” has effectively improved the quality level of China’s rebar products, which has significantly improved the variety structure of rebar. The production ratio of rebar of Grade III and above has been significantly improved. In 2016, the proportion of production of rebar Grade III and above by the members of China Iron and Steel Association reached 97.1%, an increase of 4.9% over 2015.

## **4.4 Situation Faced and Work Prospects**

### ***4.4.1 New Situation of Supply-Side Structural Reform in the Iron and Steel Industry***

The iron and steel industry in China has already possessed strong international competitiveness and will play an important role in building a strong manufacturing country and the international capacity cooperation and will lead the global iron and steel development for a long time. However, it should also be noted that presently the iron and steel industry is facing serious challenges of severe overcapacity and weak innovation capability. It is necessary to grasp the law of development, accelerate innovative development, resolutely implement the requirements of supply-side structural reform, and effectively promote transformation and upgrading in order to achieve sustainable development.

From an international perspective, the global economy has undergone a tortuous recovery from the deep adjustment. The global steel demand has entered a plateau period, showing a trend of stable but fluctuating development. The overcapacity of

iron and steel has become a global common problem. In particular, the trade protectionism in the international steel market is spreading, and the competition will be more intense; meanwhile, the rules system for international investment and trade will be accelerated, and the opportunities and challenges for international iron and steel capacity cooperation and international trade will coexist. A new round of scientific and technological revolution and industrial transformation are in the ascendant. The industrial form, production management, and development mode of the global iron and steel industry are undergoing an unprecedented profound transformation. The steel materials and other materials move toward a general trend of mutual competition and collaborative integration. The financial attributes of staple commodities such as iron ore and coking coal have increased, their price fluctuations have intensified, the risk of investment in the global mining industry has increased, and uncertainties have increased significantly. Relying on the strategy of reindustrialization, the advanced steel powers strengthen the scientific and technological innovation and the strategic layout in the frontier domains to occupy the commanding heights in the mid- and high-end steel markets; some emerging economies take shares from the ordinary steel market by relying on their advantages of low-cost factors such as labor; thus, the risks and challenges faced by China's iron and steel industry faces are increasing.

From the domestic perspective, the economic growth under the new normal is at a medium-to-high speed, and periodical contradictions and structural contradictions coexist, of which the structural problems are the main contradiction, and the total steel consumption and consumption intensity tend to decline. In addition, China's development mode is extensive, the unbalanced, uncoordinated, and unsustainable problems are still outstanding, resource constraints are tightening, and the deterioration of the ecological environment has not been fundamentally reversed. The iron and steel industry urgently needs to improve its innovation capability and accelerate adjustment and upgrading. However, the fundamental that China's economy will sustain long-term growth remains unchanged. In the process of achieving a jump from low-level supply–demand balance to a high level supply–demand balance, improving quality and structure of the steel product supply will form a new engine for China's iron and steel industry to move toward the mid-to-high end.

#### ***4.4.2 New Problems in the Supply-Side Structural Reform in the Iron and Steel Industry***

In the next few years, the problem of excess capacity in the iron and steel industry will still exist in China. The reduction work will still face the grim situation of internal and external troubles. Resolving excess capacity will be no longer only the scope of the iron and steel industry, but will rise to the height of the national foreign policy and economic development policy.

1. Resolving excess production capacity under the pressure of intensified international trade disputes

According to data from the Ministry of Commerce of China, there were 37 cases of trade frictions encountered by China's iron and steel industry in 2015 (an increase of 37% over the previous year), and the amount involved was 4.7 billion US dollars. The number of global trade friction incidents against China's steel exports has soared, and trade protection measures have also diversified, including single or combined means such as anti-dumping and countervailing duty investigations, tariffs, non-tariffs, and safeguard measures.

China's steel products are not export-oriented instead of meeting domestic demand, but they are more recognized on the international market because of their good quality, prices, good scale, service, and brand, so China's steel exports still remain at a high level even in the face of increasingly harsh export environment. The increase in export volume can alleviate the contradiction of excess capacity to a certain extent. However, as the situation of foreign trade of steel products deteriorates further, the reduction from the source is the solution.

## 2. USA and European countries frequently applying big stick diplomacy

The global economic downturn and shrinking demand are the root causes of excess capacity in the steel industry currently. Some countries in Europe and the USA ignore this basic fact and the positive measures taken and the great sacrifices made by the Chinese government to resolve the excess capacity of the iron and steel industry. Instead, they frequently apply trade protection measures as the main means of responding to the crisis and make indiscreet remarks or criticisms against China.

At the end of 2015, nine iron and steel associations in the USA and Europe issued joint statements for several times, stating that the global iron and steel industry was suffering from a crisis of excess capacity and China's iron and steel industry was the main influence of that issue and opposed China automatically obtaining market economy country qualification by December 2016.

In March 2016, EU issued the policy document titled *Maintaining Sustainable Employment and Growth in the European Iron and Steel Industry*, proposing that the EU would further adopt trade remedy and strengthen proactive regulation supervision on the basis of 37 anti-dumping and countervailing measures on imported steel products. In the past few months, the European Commission has conducted three investigations into Chinese steel plants and imposed punitive tariffs on two types of steel products imported from China.

In April 2016, the US Department of Commerce accused China of taking no action to reduce excess capacity at the Brussels Steel Conference and pointed out that, if China would not take immediate action to reduce excess steel production capacity, the USA and other "victimized countries" would have no choice but adopt trade measures to protect their domestic iron and steel industry and workers from damages. That was a naked threat. In the same month, the US Steel Corporation filed an application with the US International Trade Commission to request 337 investigations on the carbon steel and alloy steel products exported to USA from about 40 Chinese steel companies, including Hebei Iron and Steel Group Corporation and Shanghai Baosteel Group Corporation, and issued a permanent exclusion order and prohibition.

Excess capacity of iron and steel industry is a global problem. It is the common challenge and common responsibility of the relevant economies. Only when more countries adopt positive measures that are in line with their own national conditions and development stages, and strengthen policy communication and coordination among them, can we gradually resolve the problem of excess capacity in the iron and steel industry and achieve mutual benefit and win-win. It is foreseeable that the USA and EU will continue to ignore the efforts made and losses incurred by China in resolving excess steel production capacity and continually make indiscreet remarks or criticisms on that issue to force China to increase its efforts in cutting overcapacity through political and diplomatic means.

### 3. Domestic difficulty in cutting overcapacity is increasing in China

First, the equipment to be reduced is becoming larger. After more than a decade of eliminating outdated equipment in the iron and steel industry, a large and significant decline in the proportion of small blast furnaces and small converters has been achieved. Further, capacity reduction will inevitably face more and more large-scale equipment, and thus, the promotion work will face greater challenges.

Second, the process flow tends to be continuous and integrated, and the degree of dependence between processes is significantly increased. Taking Hebei Province as an example, in addition to the outdated equipment identified by the state in the previous stage, there are more independent ironmaking and steelmaking enterprises, their overall equipment level is low, and the processes have less influence on each other. However, most of the equipment to be reduced in the next few years belongs to the steel joint enterprises in operation. The process capacity is basically matched, and their continuous and integrated production features are more obvious. After partial or complete dismantling of ironmaking or steelmaking equipment, the corresponding systems of sintering, pelletizing, rolling, and oxygen generation, lime, power generation, etc., (partially including coking) will be significantly affected until the entire production line is shut down.

Third, the relationship between corporate equity, creditor's rights and debts is complex, and the amount of debt is large. Therefore, the risk of social instability is increased due to cutting overcapacity. The nature of Chinese iron and steel enterprises is complex, including central government enterprises, provincial enterprises, and collective, private, foreign, joint venture, and many other types. Credits and debts are also difficult to be sorted out. In addition, the total amount of debts of iron and steel enterprises is tens of billions yuan, even exceeding one billion yuan, featuring large volume. The cutting overcapacity work may lead to the withdrawal of some enterprises. The eight policies as safeguard measures do not provide specific support for debt and fixed asset losses and only provide certain financial support for capacity and personnel resettlement.

It can be seen that after the "slimming" of China's iron and steel industry, the equipment is becoming more and more large, and the process capacity matching is more reasonable; thus, the losses brought by cutting overcapacity is greater. The

whole body will be touched in case one aspect is changed, and the enterprises' resistance emotions may increase obviously. Therefore, the cutting overcapacity work will face enormous challenges.

#### ***4.4.3 New Requirements for Supply-Side Structural Reform of the Iron and Steel Industry***

To solve the problem of China's medium and long-term economic development, the fundamental solution is to promote supply-side structural reform. This is a path and barrier that is forced to go through. It is also the trend of the times and the situation. How can the supply-side structural reform be practically promoted in the iron and steel industry? In general, it shall resolutely implement the five development concepts of "innovation, coordination, greenness, openness, and sharing", and focus on the five key tasks of "cutting overcapacity, reducing excess inventory, deleveraging, reducing cost, and strengthening areas of weakness" to intensively analyze the problems existing in the industry development and then explore solutions based on that.

According to the requirements of those five development concepts, the iron and steel industry has a certain extent of disparity in several aspects. For example, in terms of innovation, China's iron and steel industry still has such problems as insufficient long-term investment in independent innovation, lack of original technology, weak collaborative innovation in production, education and research and application as well as repeated allocation of innovative resources. In addition, there are still other uncoordinated problems such as unreasonable industrial layout and poor connection between steel manufacturing, service and market demand. The above-mentioned "cutting overcapacity, reducing excess inventory, deleveraging, reducing cost, and strengthening areas of weakness" are the five key tasks of supply-side structural reform. Among them, cutting overcapacity is in the first place, and the iron and steel industry is a typical representative industry with severe overcapacity, and it is also the focus of cutting overcapacity. Therefore, cutting overcapacity is given the first priority for promoting supply-side structural reform in the iron and steel industry. However, while focusing on cutting overcapacity in the iron and steel industry, it could not neglect the requirements by other key tasks on the iron and steel industry. The objective analysis indicates that, as an important part of the real economy, a lot of achievements still can be achieved in the iron and steel industry in terms of deleveraging, reducing cost, and strengthening areas of weakness. The debt problem of some enterprises is outstanding, and thus the risk of inducing regional financial problem is increasing dramatically. In recent years, the iron and steel enterprises are subject to increasing and overwhelming rigid expenditure pressure in terms of financial expenses, which has become a critical factor influencing their market competitiveness. At the same time, the weaknesses of China's

iron and steel industry in terms of technological innovation, quality manufacturing, intelligent manufacturing, service-oriented manufacturing, green manufacturing, and international development also need to be strengthened.

#### **4.4.4 Late Outlook**

In July 2017, Premier Li Keqiang pointed out in the report of the fourth grand inspection: resolving excess capacity must be unswervingly promoted to prevent resurgence. Those who violating regulations must be resolutely punished according to laws, relevant supervision authorities must be seriously accountable for weak supervision, as well as orders and proclaim prohibition must be enforced strictly. It can be seen that the determination of the Party Central Committee and the State Council is clear and the attitude is clear. As an important part of the supply-side structural reform of the iron and steel industry, the cutting overcapacity work will continue and run through the entire 13th Five-Year Plan. Next, in addition to continuing to implement the three special actions including joint law enforcement, a series of comprehensive measures such as dynamic management of steel standard conditions, capacity reduction and replacement as well as disposal of zombie enterprises will be taken in order to achieve the core targets of the iron and steel industry in cutting overcapacity, development out of difficulties, transformation and upgrading as well as enhanced competitiveness.

Among them, reduction is an inevitable trend in the development of China's iron and steel industry. Reduction is not only to resolve excess capacity, but also to reduce steel production. It is an inevitable choice for controlling incremental and revitalizing stocks and is also important for adjusting and optimizing the structure of China's iron and steel industry. For the iron and steel industry, the development of reduction will be a long-term process for process flow adjustment, survival of the fittest, diversified development and innovation development; for the iron and steel enterprises, they shall reduce and gradually withdraw the products of inefficient production lines, optimize the structure of product production lines, enhance the quality of large-scale products, focus on developing high-end and featured products, actively combine national and regional major strategies, intervene in relevant major projects in advance, and strive to build their own strategic product systems, so as to achieve the development of total amount reduction and high-quality and large-scale products, the continuous improvement of operating benefits, and ensure that enterprises have sustainable development with quality and benefits.

### **4.5 Industrial Practices of Reduction**

The development of reduction is an important development stage for China's iron and steel industry. The clear definition and adaption to the development of reduction

will play an important role in the future development of the industry, government management and enterprises' transformation and upgrading. As a staff department of government agencies, a leader of industry development and a think tank for enterprise planning, China Metallurgical Industry Planning and Research Institute (hereinafter referred to as MPI) has done a lot of detailed work on the basic research of reduction development and transformation and upgrading, different stages of policy drafting and revision to the implementation as well as different levels of government, industry and enterprises, which have made positive and important contributions to the practical promotion of supply-side structural reform in the iron and steel industry.

The practices of MPI in promoting industry reduction are detailed in Table 4.1.

**Table 4.1** Practices of MPI in leading industry reduction

No.	Type	Main content	Typical cases
1	Basic research of industry	Focus on current situations, problem analysis, and industry situation judgment	Analysis of the Current Situations of China's Steel Production Capacity, Analysis of Resolving Capacity of China's Iron and Steel Industry, Research on the Policy Development History and Trend of China's Iron and Steel Industry, Review and Outlook of the Development of China's Iron and Steel Industry, Development Plan for Pakistan International Capacity Cooperation Park of Hengsheng Casting Industry, Special Supervision and Research on Resolving Excess Capacity in the Iron and Steel industry, Research on Bilateral Strategic Planning and Docking Cooperation Between China and Saudi Arabia, Research Bilateral Cooperation Planning Between China and Iran, Research on Capacity and Investment Cooperation Planning Between China and Jamaica, and Research on Capacity Cooperation Planning of Major Countries in Africa
2	Participation in policy drafting and revision	Analysis of and research on policy objectives, key tasks, supporting measures, organizational structure, etc.	Drafting and revision of 5th Five-Year to 12th Five-Year Development Plans for the Iron and Steel Industry, Adjustment and Upgrading Plan of Iron and Steel Industry (2016–2020), Notice on Printing and Distributing Implementation Measures for the Replacement of Production Capacity of Some Industries with Serious Excess Capacity, Guidance Catalogue of National Development and Reform Commission on Amending Industrial Structure Adjustment (2011 Edition), Opinions on Supporting the Strike of “substandard Steel” and Defining the Range of Power Frequency and Medium Frequency Induction Furnaces, Development Policy for China's Iron and Steel Industry, Standard Conditions for the Iron and Steel Industry, etc.

(continued)



**Table 4.1** (continued)

No.	Type	Main content	Typical cases
3	Policy implementation	Guide enterprises to carry out reduction development, transformation and upgrading according to the requirements of national industrial policies, and participate in the inspection and implementation of policies	Implementation Plan for Optimized Structure of Reduction System of Anshan Steel Group, proposal for Sino Egypt SMPTA Steel Project (Phase-I), Implementation Plan for Reduction, Development Out of Difficulties and Transformation of Chuanwei Group, Overall Plan for the Optimization of the Merger and Reorganization of the Iron and Steel Industry in Hebei Province, Development Plan for the Iron and Steel Industry in Anyang City, Application Report for Integration into the Park, Reduction and Upgrading Project of Hebei Baoxin Iron and Steel Group, Implementation Plan for Limited Production of Iron and Steel Industry During Heating Season in Tangshan City, Development Plan for Transformation and Upgrading of Huainan Hongtai Steel Company, Consulting Services for China-Pakistan (Teng'ao) Two-Park Development Project, Capacity Replacement Plan of Ningbo Iron and Steel Co., Ltd., and Transformation and Upgrade Pilot Program of the Iron and Steel Industry in Tangshan

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