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Current Situation and Development Trend of Chinese Nitrogen Fertilizer Industry

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- 1. Production capacity and production volume undergo rapid development, and the whole industry witnesses the upgraded overall level
- 2. Advanced coal gasification technologies are developed and applied, while structural adjustment of raw materials makes breakthrough
- 3. Industry concentration is significantly improved, and the whole industry ushers in golden age of Big Business
- 4. Agricultural demand, energy saving and environmental protection push forward the development of new varieties of nitrogen fertilizer

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—— The great progress and achievements

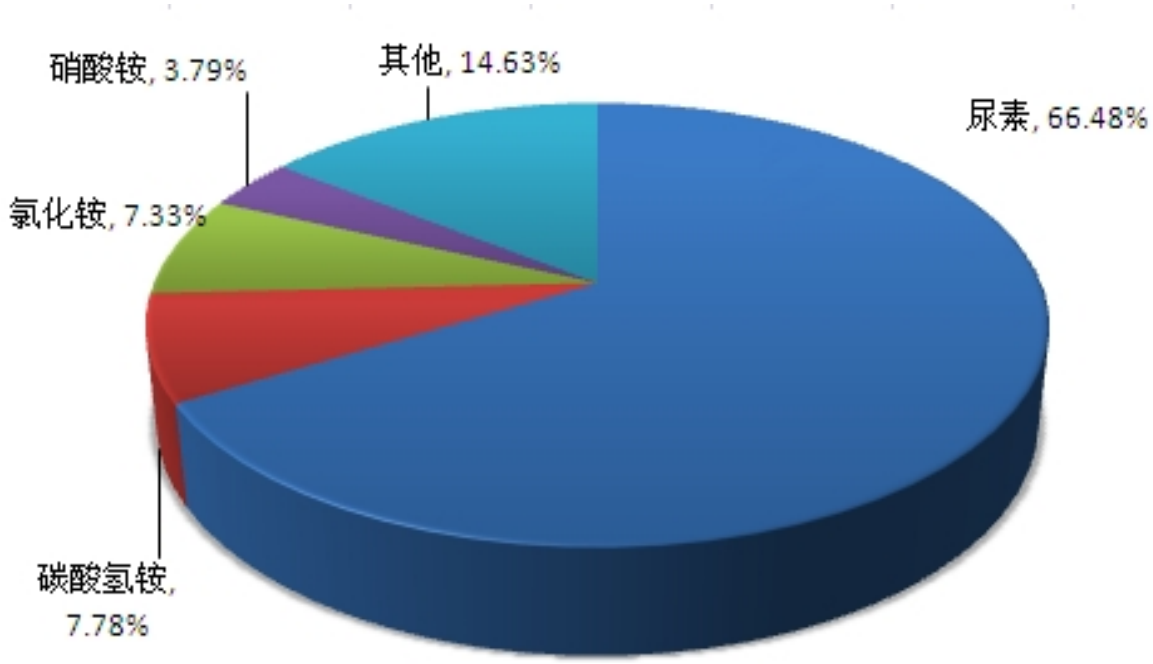
1. Production capacity and production volume by the end of 2012 (physical quantity, 10,000 tons)

	Synthetic Ammonia		Urea	
	Production Capacity	Production Volume	Production Capacity	Production Volume
China	6850	6008.2	7148	6192.6
World	20300	16600	19150	16760
Percentage%	33.7	36.2	37.3	36.9

- China has become the world's largest producing country of synthetic ammonia and urea.
- Overall level of the nitrogen fertilizer industry has improved significantly.

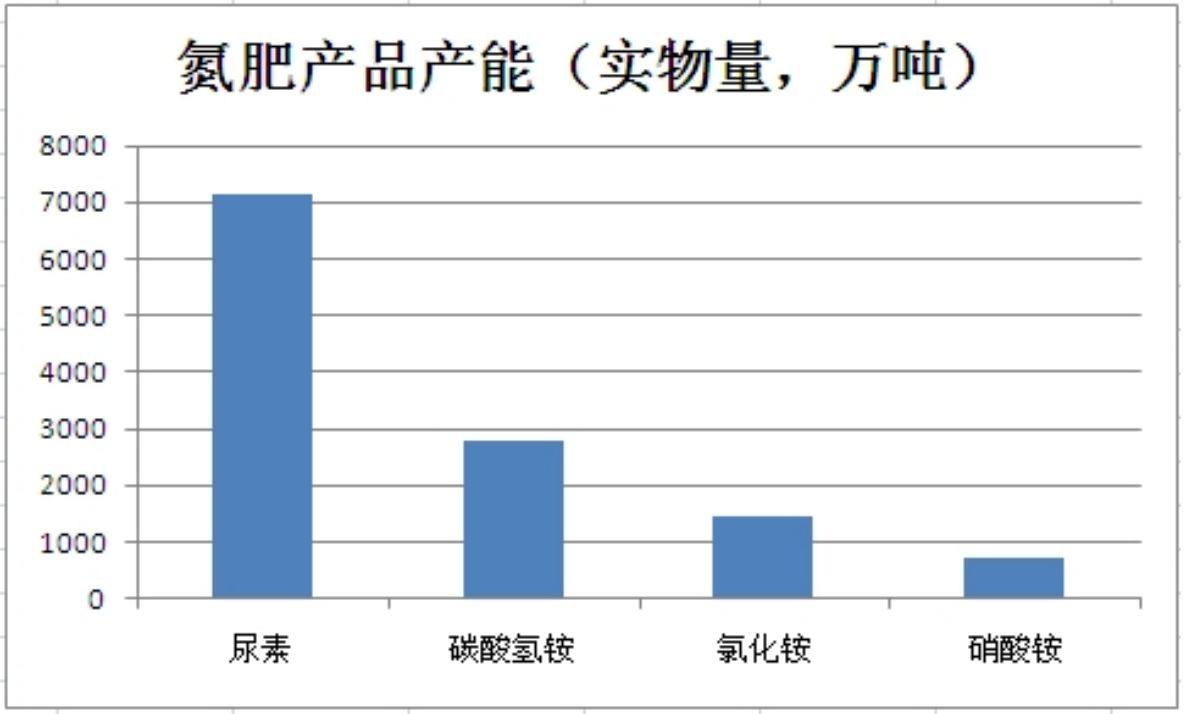
Production volume of nitrogen fertilizers in 2012

- Urea: 61.926 million tons
- Ammonium bicarbonate: 19.735 million tons
- Ammonium chloride: 12.65 million tons
- Ammonium nitrate: 4.807 million tons



Production capacity of nitrogen fertilizers by the end of 2012 (by variety)

- Urea: 71.48 million tons
- Ammonium bicarbonate: 28 million tons
- Ammonium chloride: 14.6 million tons
- Ammonium nitrate: 7.4 million tons



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2. Structural adjustment of raw materials

—Great breakthrough in new coal gasification technology (by the end of 2012)

(1) Dry Pulverized Coal Pressure Gasification Technology: Shell Gasification Technology: Ten furnaces go into production;

JSP Gasification Technology: Five furnaces go into production;

Aerospace Gasification Furnace: Six furnaces go into production

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(2) Coal Water Slurry (CWS) Gasification Technology:

GE CWS Technology: 21 furnaces go into production;

Multi-component slurry technology: Nine furnaces go into production;

Multi-nozzle mounted furnace: Six furnaces go into production;

Tsinghua Furnace: Seven furnaces go into production;

(3) British Gas-Lurgi Technology (BGL): 19 furnaces go into production.

By the end of 2012, production capacity of synthetic ammonia adopting the abovementioned new gasification technologies totaled more than 11 million tons, accounting for 16% of total production capacity of synthetic ammonia.

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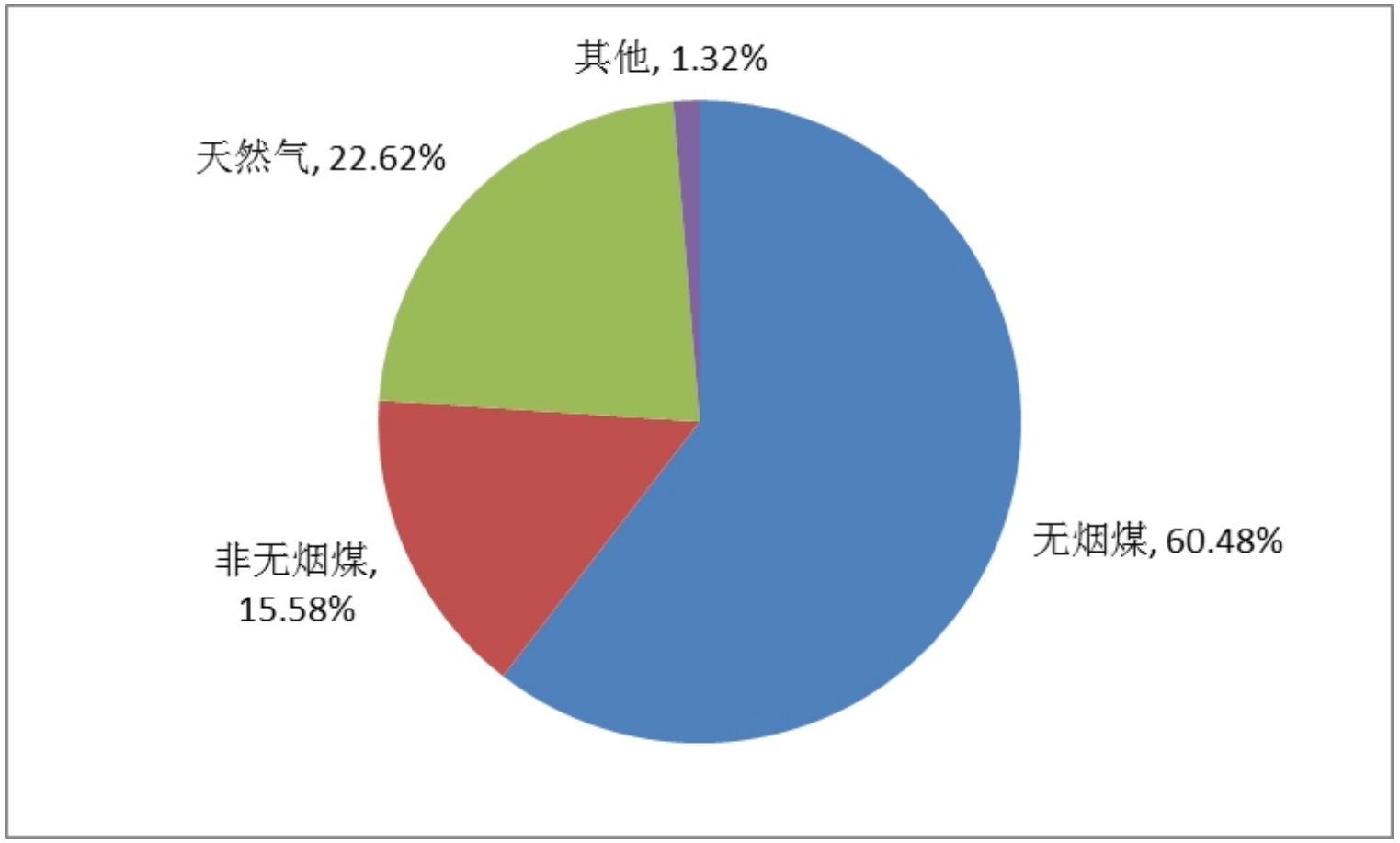
Raw material structure of synthetic ammonia by the end of 2012



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- **3. Increased industrial concentration**
- (1) Synthetic ammonia: 63 enterprises saw annual production volume of 300,000 tons and above and production capacity of 29.983 million tons, accounting for 49.9% of total production capacity;
- (2) Urea: 78 enterprises saw annual production volume of 300,000 tons and above and production capacity of 47.91 million tons, accounting for 77.6% of total production capacity.
- By 2015, the proportion of large enterprises will increase. Chinese Nitrogen Fertilizer Industry will basically usher in the era of Big Business.

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Segmented Production Volume of Synthetic Ammonia

Production Volume (10,000 tons/year)	Number of enterprises	Percentage %	Production Volume (10,000 tons/year)	Percentage %
Production Volume ⩾ 50	20	5.1	1339.8	22.3
30 ⩽ Production Volume <50	43	11.0	1658.5	27.6
18 ⩽ Production Volume<30	46	11.8	1063.5	17.7
Production Volume <18	283	72.9	1946.7	32.4
	329		6008.2	

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Segmented Production Volume of Synthetic Urea

Production Volume (10,000 tons/year)	Number of enterprises	Percentage %	Production Volume (10,000 tons/year)	Percentage %
Production Volume ⩾ 50	42	24.0	3361	54.38
30⩽ Production Volume <50	36	20.57	1437.0	23.21
Production Volume <30	97	55.43	1394.0	22.51
Total	175	100.0	6192.0	100.0

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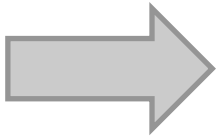
4. Development of new types of fertilizers

Agriculture demands increase production volume, farmers demand increase in income, agricultural products demand safety and environment demands protection



Improved fertilizer efficiency

It is difficult for Chinese farmers to change the traditional ideas and habits of fertilization in the short run. Therefore, production enterprises and distribution enterprises shoulder the responsibility for improving the utilization rate of fertilizers. Market demand promotes fertilizer products to develop towards differentiation, high efficiency, functionalization and other directions.

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(1) Compounding rate and mixing rate of fertilizers are raised significantly. Compound fertilizers are increasingly favored by farmers;

(2) With popularization and application of soil testing and formulated fertilization technology, bulk blending fertilizers develop.

(3) Development of stabilization, value-added and slow-release technologies for nitrogen fertilizer gives birth to new types of fertilizers with specific functions.

Such fertilizers boast such advantages as reduced frequency of application, improvement on nitrogen use efficiency and alleviation of environmental pollution. They will develop on the basis of traditional fertilizers.

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- 1. Excessive Production Capacity
- 2. Resource constraints and environmental constraints
- 3. Adjustment of fertilizer incentives
- 4. Export policy
- 5. Slack-season reserve policy
- 6. Development of agricultural industrialization

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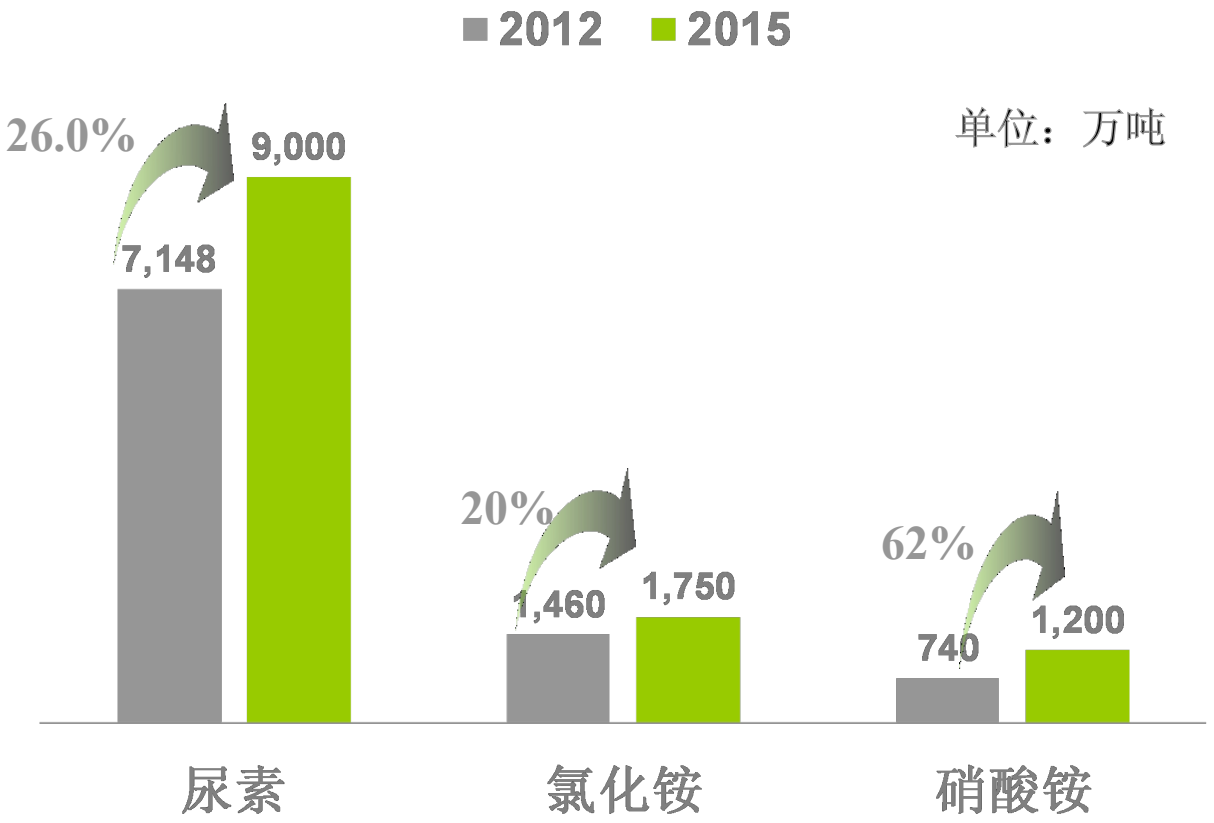
1. Excessive Production Capacity



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2. Constraints of resources and environment

- Resource constraints:
- China implements total quantity control for energy;
- China has specified energy consumption limits over various types of energy-consuming products in order to strengthen the supervision for energy consumption of enterprises (including synthetic ammonia, urea, ammonium bicarbonate, ammonium nitrate, nitric acid, etc)
- Natural gas, electricity, coal, water and other resources constantly witness price hikes.

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- **Environmental constraints:**

- *Environmental Protection Law of the PRC* expressly states that offenders shall bear criminal liability;

- Enterprises, which fail to discharge up to standards for a long time and cause serious consequences on the environment, shall be eliminated;

- *Environmental Protection Tax Law of the PRC (Submittal for Review)* has been drafted, which is now soliciting opinions on revisions. *Environmental Protection Tax Law of the PRC* expressly specifies: Air pollutants, water pollution, solid waste and noise, discharged to the environment, will be subject to transformation from administrative fees into taxes. Environmental protection tax shall be imposed.

- When the time is ripe, tax of carbon dioxide emission will be imposed.

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3. Adjustment of fertilizer incentives

- For a long time, for the purpose of effectively satisfying a billion people's demands for eating and clothing, the State gives the necessary support for fertilizer industry. Natural gas charges of synthetic ammonia enterprises, freight rates of fertilizer products and electricity charges of mid/small-sized synthetic ammonia enterprises enjoy the privileges, and most of the fertilizer products are exempt from value added tax, which plays an important role in the development of Chinese chemical fertilizer industry.

- At present, although preferential policies haven't been cancelled, with the development of market economy, natural gas charges, freight rates and electricity charges have been raised several times, and the privileges have been significantly weakened. It is foreseeable that in the near future, preferential policies for fertilizer industry will be necessarily cancelled.

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(1) Natural gas charges for fertilizer: Currently, fertilizer enterprises are imposed with in-factory natural gas charge of 1.6 yuan/M^3 (stock gas) and incremental charge of over 2.0 yuan/M^3. By 2016, preferential natural gas charge for fertilizer will be lifted.

(2) Electricity charges of mid/small-sized synthetic ammonia enterprises: Currently, it is 0.45-0.5 yuan/KWH on average. If charge concessions are cancelled, urea production enterprises, powered by motors, will see urea production cost every ton increase by 150-300 yuan.

(3) Freight rates of fertilizer products: Rail transport of fertilizers implemented special freight rate (23.4 yuan/ton for a thousand kilometers) before 2003. After several adjustments of freight rates, Freight Rate Scheme No. 2 is implemented now (73 yuan/ton for a thousand kilometers).

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(4) VAT:

VAT is associated with product cost and sales price. Under normal circumstances, a ton of urea can be exempt from VAT by 60-100 yuan. Amount of VAT shows positive correlation with economic efficiency of enterprises. Enterprises with high economic efficiency enjoy relatively more exemptions. Enterprise running under deficit are disqualified to enjoy exemptions. VAT exemption policy is also such a policy aimed to make excellent and strong enterprises march towards the greater goal, which should be continuously implemented at this stage.

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4. Urea export policy:

In order to guarantee domestic usage of fertilizers, since 2004, several adjustments have been made for fertilizer export policy. Firstly, different tariffs are implemented in slack season and peak season. Secondly, ad valorem tariff is implemented. In 2013, benchmark price of urea is 2.26 yuan/kg. Window period of slack season runs from July 1 to October 31, with tariff rate of 2%. In remaining eight months of 2013, special tariff is levied at 75%.

Such export policy can definitely satisfy the domestic fertilizer demand, but it no longer echo with the actual situation of Chinese chemical fertilizer industry. In context of excessive production capacity, such policy limits the enterprises to make operational decision-making for both domestic and international markets, weakens Chinese enterprises' right to speak in the international market, facilitates international buyers to force down the prices. As window period of slack season is too short, logistics expense, warehousing expense and other expenses go up.

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5. Slack-season reserve policy

In order to guarantee the supply of agricultural fertilizers in peak season, slack-season commercial reserve system has been implemented for fertilizers since 2004. Operation principle of slack season reserve is specified as follows: “enterprise reserve, bank loan, government discount, market-oriented operation, self-financing”. Since 2004, slack season reserve scale has expanded year by year. The total annual scale of slack season reserve reached 16 million tons, which increases by 2 million tons in 2013.

Slack season reserve helps ensure usage of fertilizers in spring. But in the past two years, with increase in overcapacity of fertilizers, coupled with excessive reserves, peak-season fertilizer prices are lower than those in slack season. Moreover, there are many problems such as lack of market confidence, loss of agricultural enterprises and low operating rate of enterprises.

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5. Development of agricultural industrialization

(1) Change in agricultural operation entities:

Traditional individual farmers gradually give place to large-scale farming households, family farms and other representatives of the advanced productive forces in the agriculture, which will be the main service object of agricultural enterprises in the future.

(2) Efficiency of agriculture and development of agricultural products towards safety, ecological friendliness and environmental friendliness require that fertilizers must develop to become efficient, refined, functional, convenient and friendly.

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(3) In view of intensified, large-scale and mechanized production modes in the agriculture, fertilizer enterprises should actively innovate business modes, and transform from the traditional fertilizer suppliers to integrated service providers.

(4) The popularization of the scientific fertilization philosophy and promotion of soil testing and formulated fertilization technology and water-fertilizer integration technology raise new requirements for the varieties of nitrogen fertilizers, and afford good opportunity for the development of new varieties of fertilizers.

—Calling on nitrogen product innovation and service innovation

—Pushing forward the integration and survival of the fittest among agricultural enterprises

II. Key Tasks and Orientation of Nitrogen Fertilizer Industry in Last Two Years of the Twelfth "Five-year Plan" Period

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- 1. Comprehensively solving the problem of Excessive Production Capacity with concerted efforts
- 2. Making structural adjustment of fertilizer varieties
- 3. Giving priority to innovation under the new situation
- 4. Maintaining market stability and avoiding excessive competition

II. Key Tasks and Orientation of Nitrogen Fertilizer Industry in Last Two Years of the Twelfth "Five-year Plan" Period

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1. Comprehensively solving the problem of Excessive Production Capacity with concerted efforts

(1) To strictly control new construction, and keep the expansion of excessive production capacity in limits from the beginning;

(2) To take administrative means and market means to speed up the elimination of backward production capacity;

(3) To launch technical innovation and develop new downstream applications to digest some of the surplus production capacity

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(4) To reform export mechanism, achieve convergence and balance for domestic market and international market, play the role of both markets, and ease pressure on the domestic market;

(5) To strengthen production license management. For enterprises falling short of criteria, the authorities should not issue relevant production licenses.

(6) To encourage corporate mergers and acquisitions, replace backward production capacity with superior production capacity, and improve industrial concentration.

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2. Making structural adjustment of fertilizer varieties

(1) To properly launch production of traditional nitrogen fertilizers to meet the needs for soil testing and formulated fertilizers and new types of fertilizers;

(2) To actively develop stable urea and value-added urea, and reduce sales volume on conventional urea market. Stabilizers or synergists are added easily, and device revamping and production costs are relatively low so that products are suitable for field crops;

(3) To actively develop slow-release and controlled-release fertilizers, stabilized fertilizers and value-added fertilizers. Nitrogen fertilizer production enterprises will strive to emerge as the backbone in the production of the high-end fertilizers.

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(4) To pay attention to the development of nitro fertilizer to meet the needs of nitrate nitrogen in the agriculture, vigorously develop urea ammonium nitrate solution, and provide high-end water-soluble fertilizers for to promote water-fertilizer integration technology.

(5) To do a good job in agricultural fertilization services, and help farmers grasp and establish the scientific concepts and methods of fertilization to achieve scientific and rational application and enjoy effects of increase in production volume and revenue.

In short, fertilizer production enterprises should pay attention to technological innovation of fertilizers, promote the elemental fertilizers to develop towards compound fertilizers and mixed fertilizers and promote conventional fertilizers to develop towards efficient, functional and liquid fertilizers, meet the different needs of agriculture, and improve utilization rate of nitrogen fertilizer.

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3. Giving priority to innovation under the new situation

Production enterprises should play the role of main force in the innovation, emphasize technological innovation of existing production processes, equipment and other aspects, optimization and upgrading of technical measures for energy saving and emission reduction, and achieve planning and deployment for long-term strategic innovation.

(1) Strategic innovation: During the Thirteenth "Five-year Plan" Period, in the new development platform and under the new competition pattern, enterprises should ponder over new strategic positioning and development goals in the next five years or even longer time.

(2) Management innovation: Enterprises should focus on management reform, optimize the organizational structure and management processes, learn and adopt advanced management experience of multinational enterprises, and improve the scientific management level.

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(4) System innovation: To set up open innovation system, implement "Absorbing Foreign Experience and Going Global", achieve multifaceted development of innovation alliance among enterprises, universities, research institutes and users, and enhance independent innovation capability and core competitiveness.

(5) Industrialization technology innovation: To launch digestion, absorption and innovation of imported technologies and combine such technologies with independent innovation so as to form proprietary technologies with independent intellectual property rights.

(6) Increase in innovation inputs: To establish effective incentives for innovation, set up specialized technology R& D institutions, and increase inputs in innovation.

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4. Maintaining market stability and avoiding excessive competition

Excessive production capacity, lack of market confidence and agricultural enterprises under breakeven condition and even on the brink of loss restrict healthy development of the industry. If this situation continues, it is not conducive to the development of the industry, and even will hinder the good starting of the Thirteenth "Five-year Plan" Period.

(1) In order to prevent excessive competition resulting from excessive production capacity, it is necessary to set up a good industry information platform, launch information exchange and communication at a regular basis, unify the awareness of the market, boost confidence and lessen the negative impact of excessive production capacity.

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(2) It is necessary to adapt to the general trend of agricultural industrialization development and achieve proper integration of the whole agricultural industry. Production enterprises and distribution enterprises (including large-scale farming households) should carry out the in-depth cooperation, achieve upstream and downstream integrated development through capital combination, and push forward the steady and healthy agricultural market.

(3) It is necessary to improve the integrity awareness and risk prevention ability of the whole industry and enterprises, enhance self-discipline in the whole industry, standardize the order of competition within the industry, regard rivals as partners, cooperate hand in hand, and jointly promote the healthy development of the industry.

Brief Summary

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- At present, China's economy is at a phase of in-depth adjustment with full of challenges, but it also implies tremendous opportunities and potentials.
- In the next two years and the Thirteenth “Five-year Plan” Period, Chinese nitrogenous fertilizer industry will face up to a lot of uncertainty factors. However, the historic reform of agriculture will provide new opportunities for development of fertilizer industry.
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- It is necessary to rely on the great power of science and technology, significantly improve the capability of independent innovation, solve such problems as extensive development mode, excessive production capacity, serious structural contradictions and deteriorated resource constraints and environmental constraints in the long-term rapid development, achieve the goals of optimizing and adjusting the industrial structure and transformation of development mode, and make greater contributions for the modernized development of agriculture.