Strategy Research on Incentive Mechanism for Scientific and Technical Personnel in State Grid Corporation of China

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Abstract. At present, enterprises generally put scientific and technological innovation in the first place of their own strategic development. The core element of scientific and technological innovation is human resource. It is necessary to continuously inspire the vitality of scientific and technical personnel to improve the efficiency and benefit of innovation. From the realistic need of promoting incentive mechanism of scientific and technological innovation of enterprises, this article draws a conclusion that it’s necessary for State Grid Corporation of China to carry out incentive mechanism for scientific and technological personnel. On this basis, this article puts forward the ideas of incentive mechanism for scientific and technological personnel in State Grid Corporation of China, namely, growth incentives, spiritual incentives, economic incentives, environmental incentives, as well as selection model of incentive mechanism for scientific and technical personnel. Finally, on the basis of integrating the selection model of incentive mechanism, scientific and technological enterprises affiliated to State Grid Corporation of China are divided into four categories: technical research unit, soft scientific research unit, industrial unit, provincial (city) company. Meanwhile this article proposes different incentive strategies for the different subordinate enterprises. The contingent of scientific and technological personnel is the strategic core resource that relates to the development of scientific and technological innovation of companies in overall situation. And it’s an important support to successfully construct an international first-class science and technology innovation system. At present, there exist many problems in construction of talent team of scientific and technological innovation of State Grid Corporation of China. Such as lack of high-end technology leaders who have influence in scientific research at home and abroad, lack of systematic training and smooth career development channel, and incentive mean for innovation talents of scientific and technological is single. These all can’t fully meet the development needs about the construction on "two class" of company. In order to build a world-class science and technology innovation system, it is necessary to further innovate the way of construction on scientific and technological personnel of the company. It’s necessary to speed up introduction, allocation, cultivation and incentive for scientific and technological talents. And it’s necessary to strive to establish a contingent of scientific and technological personnel that have the adequacy of the number of people, reasonable structure, good quality adopted to the world-class science and technology innovation system.

Realistic Need of Incentive Mechanism

Incentive mechanism is an important mean in human resource management of enterprises, and it plays a key role in mobilizing the enthusiasm of the staff and stimulating their creativity. At the National Conference on scientific and technological innovation, Chairman Xi Jinping proposed to improve the sharing proportion of income of achievements transformation in scientific research, and explore in implementing equity right, option, dividends and other incentives for innovative talents. “The Interim Measures on the Equity and Dividend Incentive for the State Owned Science and Technology Enterprises” has officially issued. It says clearly that enterprises can implement equity sale, equity rewards, equity options and other equity incentives or implement dividends of project benefits and other incentives for the important technology or management personnel. The Interim
Measures defines the scope and conditions of implementation of the equity and dividend incentive. For example, equity incentive is applicable to unlisted technology enterprises with corporate legal personality and sound management structure, and enterprises owned by the whole people can implement incentive of dividend of project benefits and post dividends referring to it. "National Innovation—Driven Development Strategy" says that the government should actively guide qualified state-owned science and technology enterprises to implement policies of incentives of equity and dividend. Implement relevant policies of reward of achievements transformation for state-owned enterprises and institutions. Strengthen incentives for people, so that all kinds of subjects, innovative talents of different positions can get a reasonable return in the industrialization process of scientific and technological achievements.

The Necessities of Launching Incentive Mechanism in State Grid Corporation of China

According to the development plan of science and technology of company, during "the 12th Five-Year Plan" period, company will focus on breakthroughs in key technologies in the communications network. The key technologies include comprehensive utilization of a variety of energy power generation and coordinated control, new type of transmission and intelligent equipment, intelligent control and self-healing of large power grid, intelligent of environment perception and so on. The company will solve comprehensive low carbon utilization of multiple energy sources, application of large capacity transmission and transformation technology, security defense of complex grid and other issues. The company hope to achieve intelligent operation of large power grids, high efficiency of power transmission, maximization of scale of resource allocation, harmonization of power grid and resource environment. Want to construct "green, strong and intelligent" power grid with extra-high voltage (EHV) as the backbone and coordinated development of power grid at all levels. Faced with the new situation and new tasks in the development of science and technology, the company needs to further enhance the construction of contingent of innovation talents of science and technology.

Structure to be Optimized, the Proportion of High-end Talent to be Improved

Currently, it is difficult to meet the development needs of international first-class science and technology innovation system, because of lack of scientific and technological talents and their reserve forces as the high-end innovation talents of science and technology. The distribution of scientific and technological talents is not balanced. There are more stock in the core technology and application technology of the power grid, but the emerging business areas such as forward-looking, basic research and equipment manufacturing are scarce. Knowledge structure and configuration are not reasonable, especially in the shortage of inter-disciplinary talents of UHV and smart grid. The concept of "lifelong learning" is not strong. To a certain extent, there exist knowledge aging and capacity degradation. It's urgently to improve the proportion of high-end talents.

Lack of Systematic Training for Innovation Talents of Science and Technology

At present, the institutes of scientific research cultivate the innovation talents of science and technology mostly in the way of "burden" and "old with new" in scientific research. On the one hand, it needs to make an overall planning in the cultivation of innovation talents of science and technology for the company, and it needs to establish the intensive management system of integration and sharing of training resources of scientific and technological personnel. On the other hand, the training of innovation talents of science and technology by various units mainly bases on the construction of research team of science and technology, and lacks systematic planning and overall promotion of personnel training in various fields of professional technology.

Lack of Smooth Career Development Channel and Serious Brain Drain

Because of cross dislocation of administrative functions and technical functions in institutes of scientific research, researchers can’t concentrate on scientific research, which leads to serious brain drain. In the direction of loss, there are three main types: turning to management positions, being
poached by multinational companies and self-employed. The provincial companies lack stable fund support for scientific research, lacks the full-time research staff, resulting in the ability of scientific research being insufficient. It is not conducive to attract and retain innovation talents of science and technology, and is not conducive to cultivate scientific and technological leaders with strong innovation ability of science and technology and international influence as well as top-notch young and middle-aged talents.

**Lack of Diversified Incentives for Innovation Talents of Science and Technology**

Scientific and technological achievements obtained by scientific researchers need to be recognized by society and companies, including awards for scientific research achievements and promotion channels. So far, the total number of awards in social and industry that companies can declare each year is limited. Many outstanding achievements in scientific research and science and technology innovations in production line lack of opportunities to apply for award. The company also lacks other diversified incentives (such as professional training programs, innovation fund programs, etc.) to motivate scientific and technological personnel. A variety of factors lead to the decline of enthusiasm of scientific and technological personnel in scientific research, and affect the vitality of scientific and technological innovation of the company.

Due to the above problems and deficiencies, it’s necessary for the company to further strengthen the construction of science and technology innovation system. On the basis of summarizing the effectiveness of construction of innovation talents of science and technology, the company should continue to deepen the reform of management system in scientific research and innovation talents. The company should learn the successful experience from the international first-class innovation system with more open field of vision, open concept and open attitude. Further improve the management level of management personnel in scientific research, perfect the construction of system of talent team, train leading talents of science and technology, and build excellent research team of science and technology.

**Ideas of Incentive Mechanism for State Grid Corporation of China**

The state-owned enterprise should adopt a variety of incentives methods to motivate scientific and technical personnel, mainly including four aspects: economic incentives, spiritual incentives, growth incentives and environmental incentives. The company should take account of all aspects, and can’t do one thing and neglect the other.

![Figure 1. Construction framework of incentive mechanism for scientific and technical personnel.](image)
Among them, in economic incentives, the company gives scientific and technological personnel sufficient material incentives in terms of income mainly through salary, reward, dividends and other forms. In spiritual incentives, the company stimulates the inherent sense of honor and sense of achievement of scientific and technological personnel to encourage them to excel in their work mainly by awarding awards, honorary titles and other forms. In growth incentives, the company provides opportunities of personal learning and exercise and promote the career and personal development for scientific and technical personnel by setting up career development channels. In environmental incentives, the company provides environmental protection for scientific and technical personnel to concentrate on scientific and technological work, mainly by providing flexible and easy working environment and reducing the workload of them.

**Incentive Mode Selection**

The company comprehensively considered the development orientation of the scientific research units of the company and the implementation conditions of dividend incentive, and combined the advantages and disadvantages of each incentive mode. Based on the analysis of three dimensions of enterprise nature, establishment time and achievement characteristics, State Grid Corporation of China constructed the incentive mode selection for scientific and technical personnel, as shown in figure 2.

![Diagram](image)

Figure 2. The General Model of Incentive Mode Selection for State Grid Corporation of China.

Enterprise nature: use different standards according to whether an enterprise is a listed company or not: state-owned listed science and technology enterprises do the implementation in accordance with the "Equity Incentive Approach for Listed Companies"; Non-listed state-owned science and technology enterprises do the implementation according to the "Interim Measures on Equity and Dividend Incentives for State-owned Science and Technology Enterprises". Enterprises that do not meet the two measures adopt other incentives other than economic incentives.

Establishment time: “is the establishment time of enterprise over three years or not” as one of the boundary conditions for incentive mode selection.
Achievement characteristics: If the company has no conversion in scientific research or conversion value is difficult to verify and allocate, the achievements conversion rate of less than 30%, then take dividend incentives; if the type of achievement can be transformed and valued, the company adopts equity incentives.

**Incentive Strategies for State Grid Corporation of China**

Based on the incentive mode selection of the company, the affiliated enterprises in science and technology are divided into four major categories: technical research units, soft scientific research units, industrial units, provincial (city) companies.

Technical research units: compared with industrial units, due to mainly engaging in front-end research work, transformation cycle of scientific and technological achievements in the technical research units is long, which are directly under State Grid Corporation of China (such as China Electric Power Research Institute, Guo Wang Qi Lian Electric Power Research Institute, etc.). Scientific and technological achievements can be directly transformed in the short term are relatively deficient. Sometimes there exists the situation in which the value of the conversion achievements is not easily approved and difficult to allocate. In order to achieve the incentive effect, it is suggested to adopt the incentive method of job dividend in the early stage. With the emergence of incentive effect, the transformation of scientific research results more smoothly, the transformation mechanism more sound, value approved and distribution mechanism gradually formed, the company can carry out dividend of project revenue with more targeted incentive and more incentive value.

Soft scientific research units: due to the nature of the study, the soft scientific research units and design research units that are directly under State Grid Corporation of China (such as State Grid Energy Research Institute, State Power Economic Research Institute, etc.) generally do not produce scientific research results that can be directly transformed. In order to achieve the incentive effect, it is recommended to adopt the incentive method of post bonus. Form a dividend incentive standard and carry out incentive allocation on the basis of a comprehensive evaluation on the post value, job performance and scientific research achievements of the incentive object.

Industrial units: for listed companies, it is recommended to implement equity incentives for scientific and technical personnel, referring to the "Tentative Measures on implementation of equity incentive for State-controlled listed companies (domestic)" ([2006] No. 175). At the same time, carry out the dividend incentive of project income with reference to "Laws on Promoting Transformation of Scientific and Technological Achievements "; For Non-listed Companies, take the dividend approach of project revenue to promote transformation of scientific and technological achievements with more targeted.

Province (city) Companies: for provincial scientific research units, due to their scientific research mostly for technical services, less produce scientific and technological achievements which can directly turned into industrialization. It's suggested that post dividend should be as the main incentive mode in the early stage of incentive. With the emergence of incentive effects, the process of industrialization of scientific and technological achievements accelerated, the transformation mechanism more sound, value approved and distribution mechanism gradually formed, the company can take dividends of project revenue and post dividends together as the incentive mode.

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73
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