Research on Energy and Electricity Marketization Strategy: Standard Essential Patent Perspective

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Abstract. Under the influence of the trend of "patent standardization" and "standard patenting", standard essential patents and energy and power are increasingly close. This paper analyzes standard essential patents from the perspectives of standard essential patent value analysis and the development status of standard essential patents at home and abroad. At the same time, this paper puts forward the strategic governance framework of energy and power SEP, and analyzes the SEP market-oriented competition strategy from typical industries such as communication, automobile and electric power, etc. Through the analysis of the difference between the standard essential patents market-oriented mechanism of typical enterprises in energy and power and communication, it puts forward the path of energy and power standard essential patents market-oriented and the development suggestions.

Keywords: standard essential patents; energy power; patent licensing; marketization

1 Introduction

With the rapid development of science and technology and the deepening of economic globalization, the link between patents and standards has become increasingly close, and has gradually moved from separation to integration, forming standard-essential patents. Standards Essential Patents (SEPs) are patents that must be used in the implementation of a certain technical standard[1]. Under the background of carbon peak carbon neutral, energy and power transformation will bring about the wide application of advanced energy technologies and digital technologies such as "big cloud, material, mobile and intelligence", and China will inevitably touch the interest pattern of the existing market while realizing technological breakthroughs and catching up in the key areas of energy and power, and will face direct competition with many western technology giants in the development of new business growth points. The development of new business growth points will also face direct competition with many Western technology giants.From the global international competition situation, the patent and the standard "strong combination" has become the new rules of the game in the international competition, but also the western developed countries to maintain international competitive advantage and create new barriers to the important strategic means.The energy and power industry is still in the initial stage of patent standardization, and has little experience in coping with SEP problems. In the face of severe international competition, it is

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necessary to have a comprehensive understanding of SEP, analyze SEP problems, and explore the impact of SEP on the energy and power industry in order to build a faster and better cross-sectoral SEP coping strategy, and to break the new technical barriers in the West.

This paper proposes a strategic governance framework for standard essential patents in the energy and power industry from the analysis of the value of standard essential patents and the development status quo at home and abroad, and analyzes the strategic path of energy and power standard essential patents market-oriented competition, and puts forward targeted suggestions for the development of SEP in the energy and power industry, to further improve the level of integration of standards and patents in energy and power enterprises and the transformation of scientific and technological achievements, and to enhance the competitiveness of SEP.

2 Overview of standard-essential patents

2.1 Analysis of the value of standard-essential patents

Yan Ziwei pointed out that not all technologies and products have standard essential patents exist, and the current standard essential patents exist in specific industry fields, such as the field of communication, audio and video field, pharmaceutical field, etc., among which the field of communication is the most common[2]. At present, domestic and foreign issues related to the influence factors of patent value are mainly considered from multi-dimension, most of the studies are retrospective studies, and a few are prospective studies with different research perspectives. American CHI and NSF jointly created the world's first set of patent evaluation indexes, which includes seven major patent value evaluation indexes such as the number of patents, the average number of citations, scientific relevance, scientific intensity, etc[3]. And on this basis, scholars and experts have conducted in-depth discussions on the assessment indicators of patent value. Cui Weijun team compared and analyzed the 5G SEP market value based on the 5G SEP related data in ETSI in three aspects: the number of disclosures, geographic distribution, and distribution of technology fields[4]. Liu Weidong team took the High Value Patent Identification (HVPI) and Standard Essential Patent Identification (SEPI) as the indicators to measure the value of the patents[5], and came up with convincing conclusions. Ghafele Roya through the lens of the value of the FRAND injunction in Wireless Planet v. Huawei, concludes that the direct value of the injunction is greater than the estimated value of the standard-essential patents in question[6]. Indian scholars Singh Manveen team suggest that IPR policy is a determining factor in facilitating the interaction between innovators and implementers in terms of the value of licensing in standard-setting organizations[7].

2.2 Development status of standard-essential patents at home and abroad

At present, foreign developed countries focus on three aspects that affect the ineffective implementation of SEP: how to improve the transparency of SEP, how to clarify the FRAND provisions, and how to improve the efficiency and effectiveness of law enforcement, as well as focusing on the antitrust issues related to SEP[8]. Among them, the U.S. continues to strengthen the strategic significance of SEP in its international competition; the European region continues to refine its SEP-related rules; Japan strengthens its guidelines on SEP

licensing negotiation; South Korea introduces guidelines in the hope of enhancing the competitiveness of its SEP; and China focuses on maintaining a balance between the interests of right holders and enforcers, and contributes actively to the wisdom of SEP governance. The development of SEP in some countries is shown in Table 1.

Table 1. Table of SEP development in selected countries[9].

nation	Release of documents	Foucs
European Union	Intellectual property -new framework for standard-essential patents	How to improve SEP transparency clarify FRAND provisions, and how to improve enforcement efficiency and effectiveness
America	Draft Policy Statement on Standard Essential Patent License Negotiations and Remedies Subject to F/RAND Commitments	Draft Policy Statement on Standard Essential Patent License Negotiations and Remedies Subject to F/RAND Commitments
Japan	Guide to Good Faith Negotiations for Standard Essential Patent Licenses	Clarify the specific negotiation obligations of patent owners and implementers, attempt to improve the transparency of SEP license negotiations, and build a predictable licensing environment for relevant industrial entities
Korea	Standard Essential Patent Guide 2.0	Standardize the process of SEP, as well as the scope of application and precautions, etc., more conducive to the promotion and application of SEP

3 Strategic Governance Framework for Standard Essential Patents in the Energy and Power Industry

The overall construction framework of energy and power SEP is shown in Figure 1, which mainly includes four aspects: cross-industry technical standard integration and formulation, SEP-containing technical standard implementation and application, SEP issue regulation, and regulation experience and transformation. Specifically, based on the SEP needs of the energy and power industry (e.g., power 5G, electric vehicle charging, power smart robot, smart meter), the energy and power industry market development and other needs, the development of new technical standards; energy and power upstream and downstream industry chain in the FRAND principle of the implementation of the promotion of technical standards; in case of disputes, the main body involved in the law or related policies to reach a SEP license regulation, and finally achieve innovation and development, social well-being. In the end, the goal of innovative development and social well-being will be achieved; at the same time, the practical experience of the judiciary can also be reversed to promote the further refinement of laws and regulations, FRAND principles, and promote the development of the energy and power industry and market.

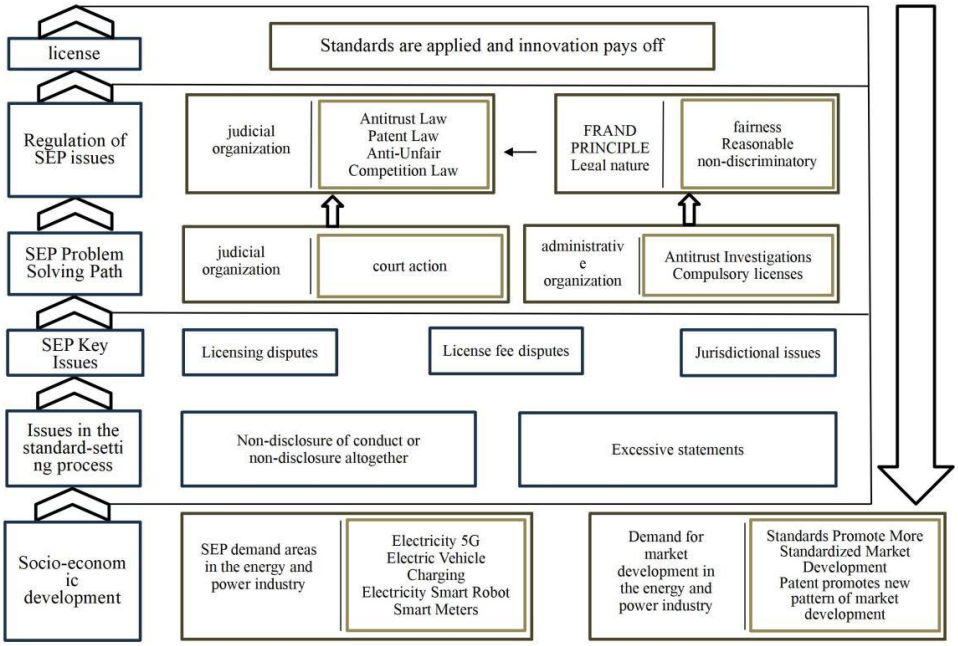

Fig. 1. Overall construction framework of energy and power SEP.

4 Strategic Path of Competitive Marketization of Standard Essential Patents for Energy and Electricity

4.1 Differential analysis of standard essential patents marketization mechanism of typical enterprises in energy, power and communication

China's energy and power industry patent standardization related research still stays in the shallow stage, the need to combine the energy and power industry's own technology, industry and other characteristics of further in-depth analysis, through the patent, standards integration mechanism related research, leading the industry standard necessary patents deep exploration and practice. Taking Huawei and State Grid as an example, Table 2 gives the differences between the two SEP market-oriented competition mechanisms.

Table 2. Differences in SEP market-based competition mechanisms between State Grid and Huawei both.

Heading level	Example	Font size and style
Configuration of Interests	Exclusion and monopoly	Openness and sharing
Construction Philosophy	Maximize company benefits	Prioritizing social responsibility
Operating Structure	Competition and Gaming	Steady advancement of market-based mechanisms
Configuration of Interests	Exclusion and monopoly	Openness and sharing

The different social attributes and performance characteristics of patents and standards also have a significant impact on the competition between public interest enterprises and commercial enterprises in market demand. Standards and patents are very different from each other in that standards are open and shared, representing the public interest, while patents are exclusive and represent private rights and interests. The process of the formation of standard-essential patents is a process in which public interests and private rights and interests are in conflict with each other and are gradually harmonized.

The different social positioning of public interest enterprises and commercial enterprises determines the different SEP market-oriented competition needs of State Grid and Huawei. Enterprises are the main participants in market economic activities, and the corporate system is the main and most typical form of organization in modern enterprises[10]. Huawei is essentially an economic entity, a mechanism for resource allocation, with the fundamental purpose of maximizing profits, and commerciality is its fundamental attribute. However, while pursuing economic interests, public welfare is also an important value that an enterprise should have, especially the State Grid Corporation, as a public welfare enterprise, should take national security and social stability as its own responsibility and assume more social responsibility.

Extra-high-voltage transmission technology is a technology with independent intellectual property rights and international leadership in China, and it is increasingly recognized by the world. In terms of UHV technology, the State Grid has formulated a total of 14 international standards for UHV transmission and 50 national standards, as well as 73 industry standards and 189 enterprise standards, which are being used around the world, realizing the open sharing of standard-essential patents rather than monopoly closure.

4.2 Competitive Strategies for Marketization of SEPs in Energy and Power and Other Typical Industries

In the field of communications, driven by the "Internet of Everything", communications companies represented by Huawei are integrating their technologies with 5G communications technologies, allowing more and more companies to join the 5G application field, realizing the overall ecological construction of 5G, and promoting the commercialization of 5G. In order to achieve the goal, firstly, it is necessary to improve relevant laws and regulations to ensure the flow of technology and information; secondly, it is necessary to break through the technological monopoly, and realize the company's position in the world from the perspective of technological monopoly; finally, it is necessary to carry out technological protection of its own patents, and to establish the standard essential patent protection system of "Chinese technology".

In the automobile industry, the main strategies adopted are patent alliance strategy, patent introduction strategy, patent cross-licensing strategy, peripheral patent strategy and technology disclosure strategy. Shanghai Azera Automobile has leading technology in the field of charging and switching stations and super charging piles in China, and has multiple R&D organizations around the world. The vast majority of the company's scientific and technological achievements belong to independent research and development, but some of the patents have been obtained through patent transfer. A variety of standard-essential patent

market competition strategies can ensure the advancement and stability of the company's technology.

In the electric power industry, China mainly adopts the EPC mode, and the technology-related patent issues involved in the EPC mode are mostly traded in the form of authorization for use. However, since China is in the international leading position in many technologies and holds the formulation of some standards, such as the Technical Specification for Fittings of ±800 kV DC Transmission Lines and the Technical Specification for Fittings of 1000 kV Substation, etc., in addition to the authorization for use of that part of the patent, the FRAND fee in the process of using the standard essential patent is also a matter of concern. In addition to the part of patents used, the FRAND fee in the process of using standard essential patents is also an issue of concern. Table 3 shows the competitive strategies of SEP market in typical industries.

Table 3. Analysis of Competitive Strategies in the SEP Market for Energy Power and Other Typical Industries .

Typical Industries	Competitive Strategies in the Standard Essential Patent Market (by Technology Dimension, Patent Dimension, Market Dimension)	Representative companies
correspond (by letter etc)	Technology monopolies (technology), patent protection (patents), patent pools (markets), patent cross-licensing (markets)	Huawei, Qualcomm, Nokia
motor vehicles	Patent alliances (market), patent introduction (patents), patent cross-licensing (market), peripheral patents and technology disclosure (technology)	azera, tesla, BYD
electrical power	Technology monopoly (technology), patent layout (patents), EPC model (market), regulating FRAND fees (market), patent alliances (market)	State Grid

4.3 Energy and Power Standard Essential Patent Marketization Paths

This paper proposes the energy and power standard essential patent marketization path through the analysis of the difference of standard essential patent marketization mechanism between energy and power and communication typical enterprises, as shown in Figure 2.

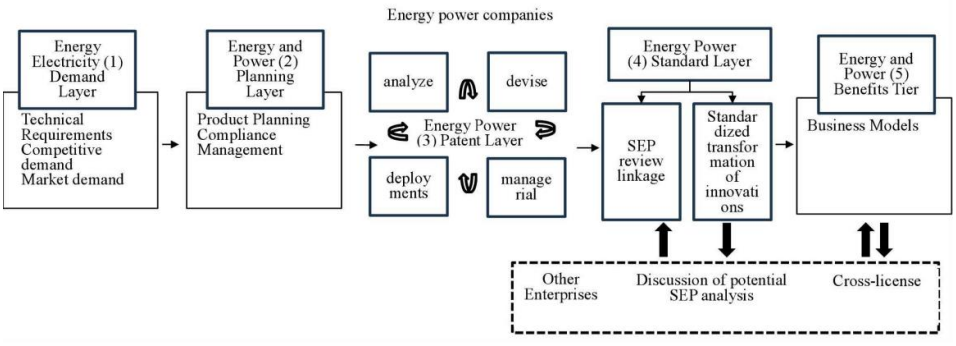

Fig.2. Energy and Power Standard Essential Patent Marketization Pathway

(1) Demand Layer

China's energy and power enterprises to pay attention to the cumulative innovation characteristics in the direction of intelligence, network connection, to achieve the operation and protection of patent achievements, need to be integrated technology needs, competition needs and market demand for three considerations.

(2) Planning level

Energy and power enterprises should consider the close cooperation between technological innovation and product management in product planning, and establish infringement risk prevention and control system by comprehensively utilizing multiple protection strategies. First of all, for each product line or each project group, establish a risk prevention system, including competitors' patent information database, risk evaluation database generated in market activities. Secondly, establish a specialized risk analysis team, including SEP information analysis and management personnel, R&D technicians, marketing and sales personnel. Finally, develop multiple protection strategies based on product line length and product line depth, product life cycle, etc.

(3) Patent Layer

The patent layer includes patent analysis, patent design application, patent management and patent deployment. China's energy and power enterprises should establish industry patent database, patent map, and always pay attention to the latest development of patents related to energy and power industry. On the other hand, strengthen the enterprise's management and analysis of patents, and effectively avoid infringing others' patents.

(4) Standard floor

The development and application of technical standards should take into account the linkage mechanism of SEP review, strengthen the standard transformation of innovative achievements to form SEPs and make disclosure in a timely manner, as well as actively participate in external standardization activities.

(5) Benefits layer

China's energy and power enterprises can learn from the experience of foreign enterprises, forming or joining a patent pool or alliance, members of the agreement between the patent cross-licensing, or even "one-stop" licensing to meet the SEP licensing needs of product sales.

5 Energy and Power Standard Essential Patent Marketization Development Suggestions

5.1 Active dialogue and full utilization of the power of market players

The supply chain structure, value creation method and profit model of different subsectors in the industry are all different to a certain extent, and the FRAND principle of standard-essential patent licensing itself has a certain degree of ambiguity and elasticity, which leads to differences in the understanding of the connotation of standard-essential patents and the specific application of different industrial entities. The existing industry dialogue platform

should be utilized to strengthen the communication and exchange between different industries and jointly build a licensing ecological environment conducive to the healthy development of the industry.

5.2 Explore and collaborate on appropriate licensing models

Standard Essential Patent License Fees shall give full consideration to the actual value contribution of the technology to the product, the market value of the intellectual property rights involved in the technology, the accumulation of royalties and other factors; both parties to a Standard Essential Patent License shall be encouraged to take the initiative in exploring diversified modes and practices of cooperation.

5.3 Effective guidance and construction of a new pattern of synergistic development of the industry

Giving full play to the role of standard-essential patents in promoting industrial development and respecting the contribution of innovation subjects; at the same time, avoiding the abusive behavior of the right holders of standard-essential patents; and studying and formulating a law on special procedures for adjudicating intellectual property cases at the judicial level, so as to clarify issues related to the application of standard-essential patents.

6 Conclusion

Starting from the value and development status quo of standard essential patents, this paper combines the market-oriented strategy of standard essential patents of typical industries and typical enterprises, puts forward the strategic governance framework of standard essential patents of energy and electric power industry, focuses on the analysis of the difference between the market-oriented mechanism of standard essential patents of energy and electric power and typical enterprises of communication, analyzes the development path of energy and electric power SEP market-oriented, and gives suggestions for the development of energy and electric power SEP. It also analyzes the development path of energy and power SEP marketization, and gives suggestions in line with the development of SEP in energy and power industry, which provides reference inspiration and technical support for energy and power enterprises to improve the level of transformation of patented technology, enhance the scientific and technological content of standards and strengthen the competitiveness of SEP marketization.

The development of energy and power industry is facing historic opportunities, SEP issues have significant risks, there is an urgent need to seize the opportunity to strengthen international cooperation, break industrial boundaries, integration of market demand, innovation and R & D vitality, the system of unified guidance, and continue to move higher, farther and stronger, to promote the healthy development of SEP ecosystem in the energy industry.

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