RESP

On The Interface Between AI and Energy Regulations in China

Çin'de Yapay Zekâ ve Enerji Düzenlemeleri Arasındaki İlişki Üzerine

Klemens Katterbauer [a], Rahmi Deniz Özbay [b], Sema Yilmaz [c] & Gözde Meral [d, *]

[a] Prof. Dr., Centre for Islamic Metafinance, Euclid University, Bangui, Central African Republic / Africa
ORCID: 0000-0001-5513-4418

[b] Prof. Dr., İstanbul Ticaret University, İstanbul/Türkiye
ORCID: 0000-0002-3927-8216

[c] Prof. Dr., Yıldız Technical University, İstanbul/Türkiye
ORCID: 0000-0002-3138-1622

[d] Prof. Dr., İstanbul University, İstanbul/Türkiye
ORCID: 0000-0002-1918-1249

ANAHTAR KELİMELER

Yapay zekâ düzenlemeleri,

Enerji düzenlemeleri

Çin

Yenilenebilir enerji hedefleri

ÖZ

Çin, enerji mevzuatında yeni bir reforma gitmektedir. Önerilen yasa, mevcut kaynakların temiz, verimli, yoğun kullanımını teşvik ederek Çin'de enerji kullanımını optimize etmeyi amaçlıyor. Teklif, enerji tedarikçilerinin güvenilir ve istikrarlı hizmetler sunmaları, enerji nakil hatlarında operasyonel güvenlik önlemleri almaları, enerjiye erişimde eşitlik sağlamaları, enerji acil müdahale sistemi kurmaları için teşvikleri içermektedir. Çin'in yapay zekâ standartları da aynı süreçten geçmekte, düzenlemeler benzerlik göstermektedir. Geçtiğimiz yıllarda, Algoritma Tavsiye Hükümleri, Etik İnceleme Önlemleri, Derin Sentez Hükümleri, Üretken Yapay Zekâ Önlemleri gibi önemli yasal değişiklikler birçok kural ve düzenlemeyi etkilemiştir. Bu çalışma kapsamında enerji ve yapay zekâ kurallarının benzer yanları, uygulamada güvenlik ve istikrarı korumanın önemi ele alınmıştır. Ek olarak yapay zekânın enerji dağıtımını nasıl iyileştirebileceği ve yeşil enerji girişimlerini nasıl destekleyebileceği tartışılmıştır.

KEYWORDS

AI regulations

Energy regulations

China

Renewable energy targets

ABSTRACT

China is undergoing new reform of its energy regulations. The proposed law aims to optimize energy use in China, encouraging clean, efficient, intensive use of existing resources. The proposal includes incentives for reliability and stability in energy supply, operational safety in transmission lines, equity in access to energy, and emergency response system. China's energy and AI regulations are similar. In the past, significant legislative changes such as Algorithm Recommendation Provisions, Ethical Review Measures, Deep Synthesis Provisions, Generative AI Measures etc. have affected many rules and regulations. The article discussed how energy and artificial intelligence rules are becoming more intertwined, how important it is to maintain security and stability, how AI can improve energy distribution and support green energy initiatives.

1. Introduction

The first primary and leading draft law in China's energy sector was unveiled. On April 26, the ninth meeting of the 14th National People's Congress Standing Committee closed in Beijing. The Chinese People's Congress website subsequently announced the "Energy Law of the People's Republic of China (Draft)" and solicited opinions from the public from April 26 to May 25. During the meeting, the new law was reviewed by the Standing Committee of the National People's Congress for the first time. In January 2024, the State Council Executive Meeting reviewed and approved the "Draft" and submitted it to the Standing Committee of the National People's Congress for review.

The National People's Congress and its Standing Committee exercise the state's legislative power. The "Legislation Law" stipulates that the bills included in the agenda of the Standing Committee meeting shall generally be submitted for voting after being reviewed at three Standing Committee meetings. The first review of the bill will listen to the proposer's explanation at the plenary meeting, and the group meeting will conduct the preliminary review (Harkavy, 2024).

On April 23, commissioned by the State Council, Li Chunlin, deputy director of the National Development and Reform Commission, explained the draft Energy Law. He pointed out that China has formulated several separate energy laws and regulations, including the Electricity Law, the Coal Law, the Energy Conservation Law, the Renewable Energy Law, and the Urban Gas Management Regulations. However, the energy field still lacks a basic and leading law. It is crucial to ensure national energy security and a significant step toward strengthening legislation in essential areas to base the Energy Law on distinct energy laws and regulations.

The Standing Committee of the National People's Congress usually meets every two months, meaning the Energy Law is expected to be officially issued within the year. The second review of the bill by the Standing Committee of the National People's Congress will hear a report on the revision of the draft law and significant issues by the Constitution and Law Committee at the plenary meeting and further review by the group meeting.

According to the "Explanation on the Energy Law of the People's Republic of China (Draft)," China's current energy development is still facing many problems and challenges, such as rapid increase in consumption, continuous increase in supply guarantee pressure, incomplete adjustment of energy structure, need to improve the level of clean and efficient utilization, inadequate energy market system, weak reserve system construction, and shortcomings in scientific and technological innovation. It is urgent to improve the legal energy system further. The draft has nine chapters and 69 articles, which provide for enhancing the energy planning system, improving the energy development and utilization system, strengthening the construction of the energy market system, improving the energy reserve system and emergency system, strengthening energy science and technology innovation, and strengthening supervision and management (Zhang et al., 2024).

Article 20 of Chapter 3 clearly states that priority should be given to the development of renewable energy, the rational development and clean and efficient use of fossil energy, and the orderly promotion of non-fossil energy to replace fossil energy and low-carbon energy to replace high-carbon energy. The energy department of the State Council will work with relevant departments to formulate medium- and long-term development goals for the development and utilization of non-fossil energy (McInerney, 2022).

In addition, the draft stipulates the basic policy orientation for the development and utilization of renewable energy, hydropower, nuclear power, coal, oil, and natural gas. It mentions that the energy department of the State Council will work with relevant departments to formulate and decompose the implementation of the minimum proportion of renewable energy in energy consumption. In the field of coal, the draft requires the state to optimize the layout of coal development and industrial structure, encourage the development of a circular economy in coal mining areas, optimize the coal consumption structure, promote the clean and efficient use of coal, and give play to the basic guarantee and system regulation role of coal in the energy supply system. In addition, it promotes the clean and efficient development of coal-fired power generation, reasonably lays coal-fired power generation construction according to the needs of stable operation of the power system and power supply guarantee, and improves the regulation capacity of coal-fired power generation (van der Vlist et al., 2024). The construction of the energy market system is also the focus of the draft, which is listed separately as the content of Chapter 4. Article 32 of the draft clearly states that the state encourages and guides various economic entities of ownership to invest in energy development and utilization, energy infrastructure construction, etc., in accordance with the law to promote the development of the energy market. The draft also stipulates that it will encourage the separation of natural monopoly businesses and competitive businesses in the energy sector, strengthen the supervision and regulation of natural monopoly businesses in the energy sector in accordance with the law, and support various entities to participate in competitive businesses in the energy sector somewhat following market rules. In addition, it will coordinate and promote the construction of a unified national coal, electricity, oil, natural gas, and other energy trading markets; require energy transmission pipeline facilities to be open to qualified entities in a fair and non-discriminatory manner; encourage upstream and downstream enterprises in the energy sector to develop in a coordinated manner and promote the coordinated advancement of the entire industrial chain; promote the establishment of an energy price formation mechanism mainly determined by market factors, and improve the energy price regulation system.

2. New Chinese Energy Regulations

After nearly 20 years, the draft Energy Law has stepped out of the State Council for the first time this year and entered the agenda of the Standing Committee of the National People's Congress. As early as 2005, the former Office of the National Energy Leading Group established the Energy Law Drafting Group, composed of 15 ministries and agencies, and began to draft the first draft of the Energy Law and first publicly solicited opinions in December 2007. Since then, the Energy Law has been in the process of revision, submission for review, inclusion in the legislative plan, and continued revision. In 2017, the National

Development and Reform Commission and the Energy Bureau organized an expert group and a working group to revise further and improve the revised draft of the Energy Law of the People's Republic of China (Draft for Review), forming a new Energy Law of the People's Republic of China (Draft for Comments), and again solicited public opinions in April 2020. From 2021 to 2023, the State Council has arranged in its annual work plan that the draft Energy Law will be submitted to the Standing Committee of the National People's Congress for deliberation. In January this year, the State Council's executive meeting reviewed and passed it and decided to submit it to the Standing Committee of the National People's Congress for deliberation. Li Jingyun of the Yinhu New Energy Strategic Research Center of the China (Shenzhen) Comprehensive Development Research Institute once wrote that energy issues involve the entire process from development and supply to utilization of many varieties, involving the interests of the government, industry, enterprises, and the public. At different stages of development, the volume, role, and status of various types of energy are also significantly different. Balancing the relationship between various energy varieties and market entities in different periods is one of the difficulties in formulating the energy law.

The Chinese legislature's National People's Congress (NPC) Standing Committee started examining two new proposals for legislation that would modernize the nation's energy industry and strengthen its nuclear power capabilities. While appreciating the nation's accomplishments in energy development, Li Chunlin, deputy head of the National Development and Reform Commission, also highlights ongoing obstacles. The proposed energy law prioritizes the promotion of non-fossil and low-carbon energy sources. A new legal framework was deemed necessary due to several factors, including low level, a weak reserve system, insufficient technical innovation, and inadequate structural adjustment. Creating the legislation is crucial to advancing superior energy development and guaranteeing the security of the country's energy supply.

The proposed law lays out a plan for streamlining China's energy mix and promoting the clean, efficient, and intensive use of the country's current energy resources while prioritizing the development of renewable energy sources like wind and solar power. Customers' need for solid energy services is prioritized, and energy providers must provide safe, consistent, and dependable services. Improved operational safety requirements for energy transmission pipeline systems are also recommended in the draft. In light of the differences in access to energy, the law promotes the construction of energy infrastructure in rural areas. It emphasizes the necessity of developing and fortifying an energy emergency response system to avert future emergencies. The draft places significant emphasis on technological innovation. Its suggestions promote research, development, and the broad use of state-of-the-art machinery and technology in essential energy areas. The NPC Standing Committee began reviewing a separate draft

law, the first in China's history devoted to nuclear energy, on the same day that marked a turning point for the nation's nuclear power industry. The new law aims to streamline the ten or more current but disjointed rules and regulations governing nuclear concerns, according to Zhang Kejian, head of the China Atomic Energy Authority, who clarified the necessity of a comprehensive legal framework.

From a global standpoint, nuclear powers and nations involved in the peaceful development of atomic energy typically employ legal rules to control and encourage the exploration, creation, and application of atomic energy activities. The 53-article draft nuclear energy law seeks to balance safeguarding public safety and environmental and ecological preservation. It also calls for intense scientific research and technological advancement in the nuclear energy sector, promotes cutting-edge technologies, and supports talent development. The draft allows for the peaceful use of atomic energy for industrial and agricultural purposes, but it also places tight restrictions on nuclear reactors and related technology. According to state-run Chinese media, safety is still the top priority, and the draft forbids delaying, hiding, or misleadingly disclosing nuclear incidents.

Even if it is challenging to get unbiased reports from China, its officials seem committed to modernizing the energy sector. This is significant for the entire world, not just China. Data from Selectra, a climate consultancy, shows that in 2022, China, the world's biggest polluter, released 9.9 billion tonnes of carbon dioxide into the atmosphere, more than twice as much as the United States (4,4 billion tonnes). China accounted for just under a third of the world's 32 billion tonnes of carbon dioxide emissions. Although the raw data presents a problematic image, the per capita emissions estimates are pretty encouraging.

3. Methodology

A comparative legal research technique is used to determine the influence of AI legislation on energy regulations in China. The difficulty with comparative legal research is that there is often no agreement on the methodology type to use or even on which approaches could be used. Despite these problems, comparative legal research stems from comparative research methods, which involve examining more than two or more macro-level units to explain the variations and similarities between the units of analysis. The term 'comparative' indicates that a researcher wishes to compare one subject to another (Van Hoecke, 2013).

Some authors suggest that some degree of similarity, known as 'comparability' or 'construct equivalence', should exist at the heart of comparative research methodologies. Another claim is that a critical challenge in finishing comparative empirical research is ensuring equivalence, or the ability to obtain reliable, comparable data across diverse settings while avoiding biases in measurement, tools, and samples. However, in real-world circumstances, 'comparability' may not indicate similarities. Explaining equivalency is also

hampered by the simple fact that the meaning of any notion is contextual. There has been criticism that the concept of comparability, which requires that the entities being compared be comparable, is not realistic (Hill, 1989).

After one has understood what comparative legal research is, you must justify why you chose it. There has been the argument that the researcher in comparative law, as she progresses through the various stages of the comparative analysis, must establish her research parameters within the theoretical framework provided in the comparative law literature and justify the direction she chooses to take in terms of methodology. In sum, the researcher must acquire the art of justifying her decisions regarding why and how she applies comparative law.

In order to address the question of why comparative law is applied, it is essential to grasp the goals and theoretical basis of comparative research methodologies that strive to draw implications beyond individual cases. The primary objective of comparative analysis is to look for similarities and differences. Looking overseas at other legal systems has been hoped to benefit the observer's national legal system by making suggestions for future developments, warning of potential difficulties, and providing an opportunity to step back from one's national system and examine it more critically but not by removing it from first place on the agenda. The objective of the article is to compare the developing energy regulations in China and the new draft and the established AI regulatory framework in the country. Given the growing interconnectedness between AI and energy, it has been a cornerstone of development (Wilson, 2007).

4. Chinese Energy Regulations

China has embraced the civil law system, which emphasizes systematic legislation. In addition to the core energy law, Chinese scholars claim that the legislative system about energy consists of six subsystems. Coal, oil and gas, electricity, nuclear power, renewable energy, and energy conservation are the main topics of these subsystems. Laws about nuclear power, oil, natural gas, and basic energy still need to be made in China. The following are the four main legislative subsystems for energy at the moment. In December 1995, the 1995 Electricity Law came into effect. As China's first energy law, this one is a benchmark for the nation's energy laws. However, many of its provisions need to be updated and require immediate amendment because they were passed during China's economic transition phase when the government still directly governed the power industry (Zhao et al., 2011).

August 1996 saw the initial release of the 1996 Coal Law, which was later revised in April 2011. It controls the mining, extraction, and use of coal and the management and operations of the coal industry. As a result, it is crucial to the advancement and security of the coal sector. Nevertheless, there are still several serious issues with the 2011 Coal Law, namely, about the disjointed regulatory framework and the

inconsistent enforcement authority of various agencies. For instance, six government agencies issue nine permits and one license necessary for coal mining operations. These are the Ministry of Land and Resources, the Administration of Work Safety, the Administration of Industry and Commerce, the State-Owned Assets Supervision and Administration Commission (SASAC), the Ministry of Environmental Protection, and the National Development and Reform Commission (NDRC). These organizations occasionally have divergent needs and even competing agendas. Therefore, conflicting authorities or the absence of a single regulator with ultimate decision-making authority compromises the efficacy of regulation. November 1997 saw the initial release of the 1997 Energy Conservation Law, which was later revised in October 2007. This all-encompassing energy rule aims to encourage energy conservation throughout societal domains. It contributes significantly to raising the economic advantages and efficiency of energy use. The amendment makes clear the relevant government power and attempts to improve the lack of enforcement. According to Article 10, the local people's government at or above the county level's energy conservation administrative department oversees and manages energy conservation initiatives within its administrative boundaries (Yang et al., 2019).

Within the parameters of their respective duties, the departments under the local people's government at or above the county level shall oversee and administer energy conservation. They shall also accept direction from the energy conservation administrative department at the same level. Additionally, the revised law has a strong emphasis on market mechanisms. It includes a chapter on incentive mechanisms that explains the nation's policies regarding energy conservation through government procurement, financing, taxation, pricing, and credit control. Lastly, the 2007 Energy Conservation Law is more enforceable because it outlines the consequences of noncompliance.

First released in February 2005, the 2005 Renewable Energy Promotion Law was revised in 2009. It is China's first renewable energy law, concentrating on the growth and application of renewable energy to enhance the nation's energy structure, guarantee a steady supply of energy, and avoid pollution and environmental harm resulting from the sharp rise in the use of fossil fuels. Its five main management procedures are total amount control, required grid connection, classified electricity pricing, cost allocation, and special funds. The government's development ambitions are outlined in the total amount control provision, which gives the market a clear signal and encourages the exploration and use of renewable energy sources.

The mandatory grid connection rule requires all power grid firms to purchase all the renewable energy accessible to them. It removes obstacles to entry into the market and lowers transaction costs for renewable energy. Different forms of renewable energy can establish their rates based on their average social costs according to the categorized

electricity pricing system. In order to prevent energy producers from bearing the entire cost of producing renewable energy, cost allocation mandates that each area distribute the increased cost of producing renewable energy equitably (Clarke, 2019).

The special funds aim to solve the excess costs of producing renewable energy. They offer financial support, in the form of subsidies, to certain renewable energy projects whose costs cannot be evenly distributed among market participants. The announcement of the Coal, Electricity, Energy Conservation, and Renewable Energy Promotion Law shows how the law is becoming increasingly essential in China's energy regulation. The establishment of energy laws is a significant advancement considering the nation's history of policy superseding legislation pertaining to energy regulation. There are still four areas of the national system that may use major improvement, though, compared to the more established energy laws and regulations in developed nations (Wang and Chang, 2014).

The way laws are designed is influenced by our knowledge of them. Except the Renewable Energy Promotion Law, most of China's energy legislation was passed during the country's transition from a planned to a market economy at the end of the 20th century. Since the energy supply was the main hindrance to development during that time, finding a solution to the energy shortfall brought on by rapid economic development took precedence. It was once believed that energy supply security and energy security were equivalent. Because of this, lawmakers thought that economic regulations about energy should only address energy production in order to guarantee an adequate, dependable, and continuous supply of energy. Stated differently, the ultimate objective of energy policy was to promote economic growth.

The notion that energy legislation should solely concentrate on energy production originated from the false belief that energy security equates to energy supply security. Therefore, in China, it was rare to challenge the idea that regulations pertaining to energy were also laws governing the economy. However, America has faced significant challenges regarding this understanding of energy security, and it is now thought that energy law needs to evaluate considerations other than economic rules. According to Richard J. Pierce Jr. and Ernest Gellhorn, social and economic regulations are becoming more intertwined. Energy institutions have been attempting to incorporate environmental costs into their legislation as environmental concerns become more prevalent in society (Yang et al., 2019).

According to Sidney A. Shapiro and Joseph P. Tomain, traditional energy regulations prioritizing economic control over environmental consideration will eventually end. To sum up, legislation pertaining to energy extends beyond economic regulating laws and encompasses environmental preservation. Therefore, environmental factors should be considered in energy regulatory legislation to meet the social regulatory purposes of energy laws.

Despite the above four energy-specific regulations, China's current regulatory framework must be revised and uniform. People are, therefore, quite optimistic about the impending Energy Law. On the regulatory framework for energy regulation, the draft of the Energy Law that was made available for feedback still needs to be clarified. Furthermore, the Ministry of Energy and the Energy Regulation Commission—which would have had unified jurisdiction to regulate energy-related issues—were established under the most recent administrative reform implemented by the State Council in March 2008. The lack of separation between political and regulatory authority, the overlap in the regulatory authority for electricity regulation, and the absence of regulatory authority for natural gas regulation are among the critical problems facing the nation's energy regulatory system (Xu, 2021).

These flaws should be fixed in upcoming energy regulatory legislation as they have significantly hampered effective regulation. The state still has some control over the energy industry in China due to the country's planned economic framework. The energy administrative management department typically has three major functions to control the nationalized energy industry. First and foremost, it is responsible for generating revenue for the state as the property's owner. Secondly, it is in charge of creating the macro energy policy because it is a department of macro-management. Thirdly, it oversees market regulation in its capacity as a micromanagement department. In contrast, governments in industrialized nations such as the United States and England typically emphasize the division of powers between macro-level policymaking and micro-level market regulation (Xu, 2021).

Though Chinese and American institutions are referred to as "regulatory commissions," the Chinese institution lacks the requisite independence in decision-making and execution due to the lack of a clear division between political and regulatory authority; numerous policymaking bodies are also in charge of regulating the market. One illustration is that the NDRC, China's primary policy-designing organization, continues to have control over the authority to set prices. The primary issue resulting from the political and regulatory branches' need for separation is that market regulation is frequently disrupted for political purposes, weakening the goals of energy regulation and sometimes even lowering market efficiency to achieve political concessions. For example, the NDRC is in charge of China's macroeconomic policies, but it also manages the energy sector's price controls and market entry. It has the authority to regulate energy prices, including price control and price intervention. Energy prices are purposely distorted and depressed to manage inflation, preserve internal social stability, and increase the price competitiveness of Chinese exporting goods. The inability to remedy the issues of waste and overconsumption of energy results from energy prices being below their worth. The lack of distinction between

political and regulatory authority also brought about the issue of regulatory authorities in one sector overlapping. Separating the two authorities aims to minimize authority overlap and specialize the responsibilities of formulating policy and carrying it out. The NDRC, the Ministry of Finance (MOF), certain provincial Economic and Trade Commissions, the SASAC, and other macro policymaking departments still retain control over many industrial regulatory authorities, meaning that the SERC lacks full regulatory authority in the field of electricity regulation because of the incomplete separation of these two authorities. As the creator of macroeconomic policies, the NDRC is responsible for designing energy policies, which include demand estimation and long-term strategic planning for the electrical sector. Meanwhile, it is responsible for a wide range of micro-regulations, including price-setting and market entrance, which are the two most significant markets. Additionally, the MOF sets the financial requirements, cost standards, and other matters pertaining to energy firms, while the SASAC is responsible for managing changes to top staff in state-owned electrical enterprises. Because of this, the SERC's authority over market regulation is limited to certain segments. In conclusion, the SERC, the body in charge of regulating electricity in China, lacks the essential authority to do so. This presents a significant issue (Schuman and Lin, 2012).

 To put it another way, China's existing system of separating political and regulatory authority is insufficient since numerous agencies involved in policymaking continue to have the authority to carry out a number of market regulatory actions, which is far from "independent regulation." As the organization in charge of regulating the electrical sector, the SERC merely has symbolic authority because it cannot control market entry and pricing. As a result, the SERC is frequently perceived as an incompetent judge. Because of the tight linkages between the energy, oil, and natural gas industries, the regulatory bodies of many nations are also in charge of mixed regulation. For instance, in the United States, FERC concurrently oversees oil transfer through pipelines, the natural gas business, and the electricity industry (Gordley, 1995).

This is because the various sectors that make up the energy sector share characteristics. For example, the three industries mentioned above are all involved in the production and distribution of energy and have natural monopolies on the market. These industries typically have related regulatory processes and needs, such as pricing control and market entry. The regulatory gap can be avoided, redundant efforts can be avoided, regulatory expenses can be decreased, and regulation efficiency can be improved by having the same regulator for various businesses. China's energy regulations, however, differ depending on the industry. Due to the complicated industrial interests involved, a regulator has yet to be established to oversee the natural gas or oil industries. Instead, the electricity regulator is solely responsible for the electricity industry. Consequently, these businesses need to be sufficiently regulated by the state.

Because energy products are essential to people's daily lives and a cornerstone of national security, they are subject to strict controls from the state. Nonetheless, while reforms in other areas have advanced quickly, China's market reform for the energy sector has lagged. The transformation of the energy regulating laws from a planned economy to a market economy is ongoing. Because of this, many regulations are created with a planned economy in mind, which leads to excessive regulation of the energy sector relative to free market principles. Market entrance regulations mandate that specific activities within a company's relevant market practices be investigated beforehand to safeguard the public interest and determine whether the enterprise can fulfill the standards for energy services (Geng et al., 2016).

This is a crucial component of the system of economic regulation. On the one hand, the market develops upon the achievement of individual interests, private rights, and the aspirations of economic beings while also demanding independence and autonomy. Conversely, "market entrance" refers to a state-performed measure of market control and is predicated on the right of the public to intervene in the market. Consequently, governmental regulation of entry into the energy market infringes private rights. More accurately, market entrance regulation limits the freedom of private enterprise. This is typically achieved by administrative licensing, carried out by the government granting permits to energy businesses (Zhang et al., 2024).

Administrative licensing can be classified into two categories under Chinese administrative law: ordinary licensing and special licensing. Regular licensing seeks to mitigate risks; often, there is no cap on the number of licenses that may be issued, provided that the prerequisites are satisfied. In order to prevent resource waste and duplicate construction, special licensing regulates the costs and quality of monopolized goods and services. Typically, a maximum number of licenses can be granted. Distinguishing between regular and special licensing is crucial for managing the strictness of market entry for various market procedures within the energy sector.

In the energy sector, it is common practice to apply special licensing in areas where there is a natural monopoly and the regular licensing method in areas without such a monopoly. It is customary to deregulate and introduce competition into industries like energy generation and sales that do not already have a natural monopoly. As long as they can meet the technical safety standards and environmental protection regulations, the market players should be able to obtain a license. Regular licensing should be implemented, and the market entrance regulation should focus on technology, safety, and environmental criteria rather than the economic soundness of the investment (Zhang et al., 2024).

On the other hand, it is customary to limit competition for financial gain in industries where there is a natural monopoly, such as the transportation of natural gas through

pipelines and the transmission of electricity. Since it can be seen as the government's right to distribute limited resources by giving license holders special permission, the government should implement special licensing, and a quantity limit. Owing to this limitation, these special permits are typically only issued to current market participants and come with stricter requirements regarding quality and pricing. Nonetheless, entry into the energy market in China is subject to stringent administrative constraints, irrespective of the sector's inherent monopoly status. Consider the market for electricity generation.

Since electricity production lacks a natural monopoly, competition ought to be permitted. In theory, investors should be permitted to enter the market as long as the construction and operation of a power plant can satisfy the technical and environmental requirements. The government does, however, put several limitations on investors in the production of energy, including limitations on generation capacity, construction location and timing, investment size, operating hours, wholesale pricing, and more. Because of this, market entry barriers are extremely high, particularly for initiatives using private funds (Roberts et al., 2021).

According to China's 1996 Electricity Law, all aspects of building, producing, supplying, and using electricity must respect environmental regulations, implement new technologies, reduce the amount of toxic waste released into the environment, and avoid pollution and other risks to the public. The state promotes and supports the use of clean, renewable energy sources to generate electricity. However, the renewable energy sector had not advanced significantly since no specific implementation standards existed. The first special law on fostering the growth of renewable energy was passed by China in 2006. It is known as the Renewable Energy Law. The SERC released the Regulatory Rules on Grid Enterprises Purchasing All Electricity Generated by Renewable Energy by the provisions of the 2006 Renewable Energy Law (Song et al., 2022).

In order to guarantee that renewable energy may connect to the grid in a timely and safe way, these Rules first mandate that the SERC keep an eye on the power generation, operation, grid connection, and network of the renewable energy projects. The requirement to purchase all electricity produced by renewable energy sources is contingent upon this. According to the NDRC 2007 Mid- and Long-Term Plans for Renewable Energy, 10% of the nation's energy should come from renewable sources (Ming et al., 2013).

The capacity of renewable energy plants increased by 3.6 million kW, or 30.6%, nationally between the end of 2005 and the end of 2007. Hydroelectricity, wind, and bioelectric power all had increases in capacity of 26.3%, 444%, and 429%, in that order (Qiu and Li, 2012).

China surpassed all other countries in 2009 as the global leader in renewable energy investment. The nation's renewable energy objective is unclear, though, as the mandatory purchase model does not specify how much renewable energy each energy provider must create or buy. In order to address this, Article 14 of the 2009 Renewable Energy Law mandates purchases and lays the groundwork for future quantity restrictions. According to Article 14, the state implements a mechanism that guarantees the purchase of electricity from renewable energy resources. Alongside the State Electricity Regulatory Commission and the State Council's public finance department, the energy department will work out the specific measures that power grid enterprises need to take in order to first schedule the generation of electricity using renewable energy resources and then purchase the full amount of electricity generated by using renewable energy resources. These measures will be determined per the national plan for developing and utilizing renewable energy resources. The target proportion between the electricity generated by using renewable energy resources and the total electricity generated will be realized during the planning period. Such actions should be promoted for implementation in the planning years by the State Council's energy department and the State Electricity Regulatory Commission. Grid connection agreements must be reached between power grid enterprises and businesses that use renewable energy resources to generate electricity. These businesses must also have completed the administrative licensing or archive-filing procedures in accordance with the plan for the development and utilization of renewable energy resources. Power grid enterprises must also purchase all the on-grid electricity from grid-connected power generation projects that comply with grid-connection technical standards within their respective coverage areas. Businesses that generate electricity have an obligation to work with businesses that manage the power system to safeguard grid security. Power grid firms are required to enhance the development of the power grid, broaden the areas in which electricity produced through renewable energy resources is supplied, and develop and implement energy storage and intelligent power grid technology (Zeng et al., 2013).

In addition, they enhance power grid administration and operation, boost the capacity to absorb electricity produced from renewable energy sources, and offer services for integrating renewable energy-generated electricity into the grid. China's mandatory purchase scheme for renewable energy is outlined in Article 14. Because renewable energy is less competitive than traditional energy in the present markets, mandatory purchase benefits the renewable energy industry in the areas of market access, pricing, and grid connection. The mandatory purchase model advances the renewable energy sector's growth and the nation's objectives for reducing emissions and energy use. Reforming the energy regulatory system is one of China's current legislative objectives regarding government regulation. Energy management requires energy control, which is also a basic fix for energy-related issues. Governments don't have to manage output on their own; if they can set up a sensible framework, productivity will rise quickly. China should pass the Energy Law or a separate Energy

Administrative Organic Law to address issues with energy regulation, such as the absence of regulatory authority, overlapping regulatory authority, and the lack of separation between political and regulatory authorities. Future energy laws in China ought to be based on the idea of "the super ministry," which calls for creating an all-encompassing Energy Regulatory Commission, a unified Ministry of Energy, and the division of political and regulatory authority. The term "Super Ministry" describes an administrative management structure consolidating multiple departments with comparable duties into a single department, coordinating coordinated efforts. China is far from having a "super ministry," though, given its existing state of overlapping regulations and a lack of separation of political and regulatory authorities (Zhao et al., 2011).

5.Chinese AI Regulations

China's AI market, valued at $23.196 billion in 2021, is projected to triple to $61.855 billion by 2025, with the Chinese government projecting that AI will generate $154,638 million in income annually by 2030. However, China is not just interested in AI spreading and its creative applications. It has also been quietly setting the standard and leaving its stamp on the regulatory landscape for AI. China enacted and implemented three separate regulatory measures at the municipal, regional, and national levels in 2022. This trend continued into 2023 when China enacted national-level laws to crack down on deepfake and generative technology in just January (Roberts et al., 2021).

China's Deep Synthesis Provisions became operative on January 10, 2023, as a component of the government's endeavor to fortify its oversight of deep synthesis technology and services. The provisions cover "deep synthesis service users" (organizations and individuals that use profound synthesis to create, duplicate, publish, or transfer information) as well as "deep synthesis service providers" (companies that offer deep synthesis services and those that provide them with technical support). "Technologies utilizing generative and/or synthetic algorithms, such as deep learning and virtual reality, to produce text, graphics, audio, video, or virtual scenes" is how the regulations define profound synthesis (Smuha, 2021).

Because of these laws' extensive reach, the production of AI-generated material for 1.4 billion people will drastically alter. China's rule goes further than the UK's, which also plans to outlaw the production and distribution of deepfake videos without permission. The policy establishes guidelines for each step of the deepfake use process, including development, labeling, and distribution. Furthermore, the law allows for the possible suppression of naturally captured content. Being one of the first nations to impose a deepfake regulation, there are concerns about whether China will use this law to further police freedom of expression too extensively. Nevertheless, discussions about what can be done to address the harms advocated by this

technology are reviving. Whatever your position on the matter, the legislation does establish a precedent that may be partially repeated in other legal systems. We will learn more specifics about implementing these laws this year (Tallberg et al., 2024).

On March 1, 2022, the Internet Information Service Algorithmic Recommendation Management Provisions came into force. This law is comparable to the DMA and DSA laws passed by the EU. The guidelines, which China's Cyberspace Administration drafted, mandate that companies offering AI-based tailored suggestions in mobile applications respect user rights, such as shielding children from damage and enabling users to add or remove tags related to their traits (Erdélyi and Goldsmith, 2018).

The three primary categories of the regulation's requirements are information service norms, user rights protection, and general provisions. Because they are already expected to comply, the regulations impact US and foreign businesses that utilize algorithms and/or machine learning in their websites or applications that operate in China. Several important clauses have to be taken into account (Sheehan, 2023).

Online service providers who also engage in online news must apply for special licensing under Article 13, which forbids the algorithmic creation of false information. Because it mandates that online service providers attend to the interests of senior consumers, particularly about fraud prevention, Article 19 provides additional protection for the elderly. Among many other things, the rule forbids phony profiles, faking traffic figures, and promoting material that is addicting. Other less apparent clauses, which represent China's stance on AI ethics, require businesses to maintain conventional wisdom, spread good vibes with vigor, and prevent or lessen disagreements or conflicts.

Like the DSA, China's recommender law requires more audits and openness for recommendation algorithms. As part of this regulation, China has established an algorithm registry to help learn about algorithms and ensure they operate within reasonable bounds. The security evaluation of registered algorithms is part of the registry; nevertheless, it is unclear how much useful information on bl ck box technologies this registry will be able to offer. In the interim, such documentation and comprehension efforts are akin to those of the DSA and other EU laws, such as the EU AI Act. More recently, China approved temporary generative AI regulations on May 23, 2023, effective on August 15, 2023. The regulations are founded on five main tenets that aim to balance innovation and legal governance. China's essential socialist ideals must be upheld by generative AI, which cannot jeopardize national security or interests, encourage discrimination and other forms of violence, or spread false information (Hine and Floridi, 2024).

It is vital to take action to stop discrimination originating from generative AI based on race, religion, country, area, gender, age, employment, and health. Generative artificial

intelligence must uphold intellectual property rights and corporate ethics to prevent unethical competition and the disclosure of trade secrets. It is also necessary to take action to increase dependability, accuracy, and transparency. In order to facilitate this, the regulations mandate that generative AI providers perform data processing operations in a manner that maximizes the authenticity, accuracy, objectivity, and diversity of training data while adhering to legal data sources, protecting intellectual property rights, and obtaining consent for the use of personal information.

China's Personal Information Protection Law (PIPL), a government data privacy law aimed at protecting personal information and addressing issues with personal data leakage, has ramifications for automated decision-making technology in addition to these laws that directly target AI. Adopted on August 20, 2021, and coming into effect on November 1, 2021, the PIPL imposes requirements on international firms operating in China and Chinese organizations to safeguard Chinese residents' privacy and personal information (Calzada, 2022).

According to the law, any type of information, whether electronically or otherwise recorded, pertaining to a known or identifiable natural person within the People's Republic of China is considered "personal information" (PI). Similar to the EU's GDPR, PI does not include anonymized data that is non-reversible once anonymized and cannot be used to identify a specific natural person. The following are some of the primary contributions made by the PIPL, together with guidelines about impact assessments and automated decision-making.

More rights are granted to data subjects on how their data is used. They can ask to have their data edited or removed, have its usage restricted, or have their prior consent revoked. Stricter guidelines for data transmission and sharing, which your company and any joint data controllers from outside parties may need to meet to pass data evaluations. Required security measures must be used when processing and storing the PI, and authorized staff members handling the PI must get training; when the amount of PI is above the threshold established by the Cybersecurity Administration of China (CAC), mandatory data localization is required (Feng, 2019).

The following regulations apply to companies and people who process personal data in China or outside the country, provided the following requirements are met. It provides goods or services to natural persons in China, or personal information is processed. Furthermore, the analysis and evaluation of the behavior of natural persons in China or other situations specified by laws and administrative rules is granted. The processing of personal information by natural persons for domestic or personal purposes is exempt from the law. This covers situations requiring immediate action to safeguard people's lives, health, or property. Aside from these exceptions, personal information handlers who violate the PIPL may be fined up to 50 million RMB, have their money confiscated (up to 5% of their yearly revenue), or

shut down their firm (Cui and Qi, 2021).

The PIPL is important in regulating AI since it controls data, which is essential to AI. The PIPL operates in China like recent instances that demonstrate how the GDPR applies to AI in the EU. This is seen in China's deepfake regulation, which stipulates that organizations using deepfakes must abide by the country's current PIPL rules.

China's Ministry of Science and Technology also released a New Generation Artificial Intelligence Code of Ethics on September 21, 2021, in addition to these rules. The National New Generation Artificial Intelligence Governance Professional Committee released the Ethics Code, which was formed by the Chinese Ministry of Science and Technology to investigate policy recommendations for AI governance. It offers guidance for natural and legal persons and other pertinent institutions and covers the entire life cycle of AI. The following are the primary contributions made by the Specification's general provisions. The first one is the enhancement of human well-being. This implies that AI systems ought to adhere to shared ideals, respect human rights and the core interests of society, foster harmony, enhance livelihoods, and adopt a sustainable strategy for the growth of the economy, society, and environment (Calzada, 2022).

The second is the promotion of justice and fairness. In order to advance equality of opportunity and justice, AI systems should be inclusive, effectively safeguard the rights and interests of those who engage with them, and distribute the advantages of AI throughout society. Respecting vulnerable populations and making accommodations where needed are important.

The third is security and privacy protection. AI systems should respect user privacy and make sure that consent is sought before processing personal data. Data handling should be done safely, and personal privacy should be legally safeguarded. As seen above, the verticals of safety, privacy, and fairness are at the center of the Specification's general provisions. Management standards are urged to concentrate on the proper governance and use of authority in order to minimize AI hazards. The Specification also includes supply specifications that emphasize observing market regulations and making sure emergency plans are in place, as well as R&D specifications on data storage and use that center on security measures and equity.

Additionally, organizational management is encouraged to expand upon the Ethics Code and create policies that align with the requirements of the systems they employ by the organization and implementation rules. The federal government is not the only entity focusing on AI legislation; provincial and local governments are also involved. In contrast to national measures that are more restrictive, regional rules in China have offered a better balance between support for innovation and regulation. Regional laws seem to endorse industry and government best practices for advancing AI development. The province and

local AI law in Shanghai and the Shenzhen Special Economic Zone are examined in this section (Dixon, 2023).

The provincial-level Shanghai Regulations, passed in September 2022 and enacted on October 1 of the same year, are intended to foster the growth of the AI industry. Regarding the creative advancement of AI, the rule is seen as industry promotion law. But in light of AI's potential future effects, the law also establishes a graded management system. It implements sandbox supervision, which gives businesses a dedicated area to test and investigate new technologies.

The Shanghai AI Regulation is unique because it allows for certain leeway in the case of minor violations. This demonstrates a more significant commitment to promoting innovation and aims to continue encouraging the development of AI without burdening businesses or developers with the dread of strict regulation. This is accomplished by including a disclaimer language that states that no administrative penalties will be applied for small infractions and that relevant municipal offices will be in charge of compiling a list of infraction behaviors. The rule also creates an Ethics Council to raise ethical awareness in this area and act as a check and balance to the innovation-center strategy (Cheng and Zeng, 2023).

Like the Shanghai Regulations, the Shenzhen AI Regulation was passed in September 2022 and became operative on November 1, 2022, with the goal of advancing the AI sector. By providing more funding for these initiatives, the rule seeks to incentivize Chinese governmental organizations, more especially those in the Shenzhen Special Economic Zone, to be at the forefront of AI adoption and development.

The policy takes a risk-management approach to AI to support this expansion. It does this by permitting Shenzhen-based AI services and products deemed to be "low-risk" to continue their trials and testing in the absence of local regulations as long as international criteria are met. The regulation's Article 72 highlights the value of AI ethics and promotes risk assessments to find unfavorable consequences in systems and goods. The risk classification system will be developed and administered by the Shenzhen government. This is a significant development even though it's a local rule because Shenzhen is home to a lot of AI and tech-related companies, and between 2021 and 2025, $108 billion USD is expected to be invested in this industry (Cheng and Zeng, 2023).

According to one perspective, China has observed how rules are increasingly being used to establish international norms and standards. In fact, China has been involved in some of the world's earliest enforcement of AI regulation, wanting to set that precedence for itself. However, there is disagreement about whether China's approach to AI regulation is a ploy for political advantage or a sincere attempt to limit the negative effects of AI system research and implementation. However, interpreting China's intentions in the AI regulatory arena in such a binary manner

would be incorrect. China's efforts are undoubtedly driven by a desire to establish international norms, but they also incorporate a multifaceted strategy aimed at regulating the negative effects of AI and comprehending "high-risk" algorithms rather than merely cataloging them. For instance, China is concentrating on the technical ramifications of digital services, whereas other regions of the world have prioritized bias and transparency, which is comparable to the goals of the DSA. Making a head start in this regard by trying to delve into the intricacy of black box technology and recommender systems through its algorithmic registry. It is becoming increasingly obvious that enterprises need to be able to keep up with the changing regulatory landscape surrounding them. Given that China seems to be ahead of the curve, it will be intriguing to observe who sets the gold standard for AI in the East, how others may be able to learn from China's example, and how East-West relations on AI continue to converge. Even if your business operates outside of China, the country's worldwide influence suggests that the laws they have proposed might be adopted in other countries (Clarke, 2019).

6. Conclusion

China is experiencing a newer energy regulatory overhaul. The proposed law lays out a plan for streamlining China's energy mix and promoting the clean, efficient, and intensive use of the country's current energy resources while giving priority to the development of renewable energy sources like wind and solar power. Customers' need for solid energy services is prioritized, and energy providers are clearly required to provide safe, consistent, and dependable services. Improved operational safety requirements for energy transmission pipeline systems are also recommended in the draft. In light of the differences in access to energy, the law promotes the construction of energy infrastructure in rural areas and emphasizes the necessity of developing and fortifying an energy emergency response system in order to avert future emergencies.

When it comes to implementing AI rules, China is advancing similarly, which creates a significant overlap between these new energy and AI regulations. The Interim Measures for Administration of Generative AI Services (Generative AI Measures), the Administrative Provisions on Deep Synthesis of Internet-based Information Services (Deep Synthesis Provisions), the Trial Measures for Ethical Review of Science and Technology Activities (Ethical Review Measures), and the Administrative Provisions on Algorithm Recommendation for Internet Information Services (Algorithm Recommendation Provisions) are just a few of the significant legal developments over the last few years that have affected a variety of policies and regulations.

The article outlined the growing interlinkage between energy and AI regulations, and the growing focus on ensuring both security and stability as well as the role that AI may play in optimizing delivery of electricity as well as strengthen renewable energy efforts.

References

Calzada, I. (2022). Citizens' data privacy in china: The state of the art of the personal information protection law (PIPL). *Smart Cities*, 5(3), pp. 1129-1150, https://doi.org/10.3390/smartcities5030057

Cheng, J. and Zeng, J. (2023). Shaping AI's future? China in global AI governance. *Journal of Contemporary China*, 32(143), 794-810, https://doi.org/10.1080/10670564.2022.2107391

Clarke, R. (2019). Regulatory alternatives for AI. *Computer Law & Security Review*, 35(4), 398-409, https://doi.org/10.1016/j.clsr.2019.04.008

Cui, S. and Qi, P. (2021). The legal construction of personal information protection and privacy under the Chinese Civil Code. *Computer Law & Security Review*, 41, 105560, https://doi.org/10.1016/j.clsr.2021.105560

Dixon, R. B. (2023). A principled governance for emerging AI regimes: lessons from China, the European Union, and the United States. *AI and Ethics*, 3(3), 793-810, https://doi.org/10.1007/s43681-022-00205-0

Erdélyi, O. J. and Goldsmith, J. (2018). Regulating artificial intelligence: Proposal for a global solution. Proceedings of the 2018 AAAI/ACM Conference on AI, Ethics, and Society, New Orleans LA, USA, 95-101, https://doi.org/10.1145/3278721.3278731

Feng, Y. (2019). The future of China's personal data protection law: challenges and prospects. *Asia Pacific Law Review*, 27(1), 62-82, https://doi.org/10.1080/10192557.2019.1646015

Geng, W., Ming, Z., Lilin, P., Ximei, L., Bo, L. and Jinhui, D. (2016). China′s new energy development: Status, constraints and reforms. *Renewable and Sustainable Energy Reviews*, 53, 885-896, https://doi.org/10.1016/j.rser.2015.09.054

Gordley, J. (1995). Comparative legal research: Its function in the development of harmonized law. *Am. J. Comp. L.*, 43, 555, https://doi.org/10.2307/840607

Harkavy, R. (2024, April 23). China begins review of new energy legislation. Retrieved from Global Legal Insights: https://www.globallegalinsights.com/news/china-begins-review-of-new-energy-legislation/ (accessed June 25 2024)

Hill, J. (1989). Comparative law, law reform and legal theory. *Oxford J. Legal Stud.*, 9, 101. https://doi.org/10.1093/ojls/9.1.101

Hine, E. and Floridi, L. (2024). Artificial intelligence with American values and Chinese characteristics: a comparative analysis of American and Chinese governmental AI policies. *AI & SOCIETY*, 39(1), 257-278, https://doi.org/10.1007/s00146-022-01499-8

McInerney, T. F. (2022). The Emergence of Intelligent Treaty Systems and the Future of International Law. *U. Ill. JL Tech. & Pol'y*, 259.

Ming, Z., Song, X., Mingjuan, M. and Xiaoli, Z. (2013). New energy bases and sustainable development in China: a review. *Renewable and Sustainable Energy Reviews*, 20, 169-185, https://doi.org/10.1016/j.rser.2012.11.067

Qiu, X., and Li, H. (2012). Energy regulation and legislation in China. *Envtl. L. Rep. News & Analysis*, 42, 10678.

Roberts, H., Cowls, J., Morley, J., Taddeo, M., Wang, V. and Floridi, L. (2021). *The Chinese approach to artificial intelligence: an analysis of policy, ethics, and regulation* (pp. 47-79). Springer International Publishing, https://doi.org/10.1007/s00146-020-00992-2

Schuman, S. and Lin, A. (2012). China's Renewable Energy Law and its impact on renewable power in China: Progress, challenges and recommendations for improving implementation. *Energy Policy*, 51, 89-109, https://doi.org/10.1016/j.enpol.2012.06.066

Sheehan, M. (2023). China's AI regulations and how they get made. *Horizons: Journal of International Relations and Sustainable Development,* 24, 108-125.

Smuha, N. A. (2021). From a 'race to AI' to a 'race to AI regulation': regulatory competition for artificial intelligence. *Law, Innovation and Technology,* 57-84, https://doi.org/10.1080/17579961.2021.1898300

Song, D., Liu, Y., Qin, T., Gu, H., Cao, Y. and Shi, H. (2022). Overview of the policy instruments for renewable energy development in China. *Energies,* 15(18), 6513, https://doi.org/10.3390/en15186513

Tallberg, J., Lundgren, M. and Geith, J. (2024). AI regulation in the European Union: examining non-state actor preferences. *Business and Politics*, 26(2), 218-239, http://dx.doi.org/10.2139/ssrn.4424114

van der Vlist, F., Helmond, A. and Ferrari, F. (2024). Big AI: Cloud infrastructure dependence and the industrialisation of artificial intelligence. *Big Data & Society*, 11(1), https://doi.org/10.1177/20539517241232630

Van Hoecke, M. (2013). Methodology of comparative legal research. *Pravovedenie*, 121.

Wang, N. and Chang, Y. C. (2014). The development of policy instruments in supporting low-carbon governance in China. *Renewable and Sustainable Energy Reviews*, 35, 126-235, https://doi.org/10.1016/j.rser.2014.03.021

Wilson, G. (2007). Comparative legal scholarship. *Research Methods for Law*, 87, https://doi.org/10.1515/9781474404259-010

Xu, S. (2021). The paradox of the energy revolution in

China: A socio-technical transition perspective. *Renewable and Sustainable Energy Reviews*, 137, 110469, https://doi.org/10.1016/j.rser.2020.110469

Yang, X., Liu, N., Zhang, P., Guo, Z., Ma, C., Hu, P. and Zhang, X. (2019). The current state of marine renewable energy policy in China. *Marine Policy*, 100, 334-341, https://doi.org/10.1016/j.marpol.2018.11.038

Zeng, M., Li, C. and Zhou, L. (2013). Progress and prospective on the police system of renewable energy in China. *Renewable and Sustainable Energy Reviews*, 20, 36-44, https://doi.org/10.1016/j.rser.2012.11.048

Zhang, Z., Luo, C., Zhang, G., Shu, Y. and Shao, S. (2024). New energy policy and green technology innovation of new energy enterprises: Evidence from China. *Energy Economics*, 136, 107743, https://doi.org/10.1016/j.eneco.2024.107743

Zhao, Z. Y., Zuo, J., Fan, L. L., and Zillante, G. (2011). Impacts of renewable energy regulations on the structure of power generation in China–a critical analysis. *Renewable Energy*, 36(1), 24-30, https://doi.org/10.1016/j.renene.2010.05.015