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Current Regulations Related to Energy Management in Ecuador

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***Abstract*---**This article aims to analyze current regulations related to energy management in Ecuador. This work focuses on a documentary methodology, not cross-sectional experimental, in whose analysis is perceived the Ecuadorian electricity sector, it is governed by the national government in the processes of generation, transmission and distribution of electrical energy in a safe and efficient way, within from the field of protection and care of the environment. This genre allows the regulations of the National Electricity Council to be positive, especially 004/11 that establishes fixed prices in a certain period, which in turn effectively affects local, regional and national investment, because this service is fundamental to society.

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Introduction

The rationing and benefits of energy in the socioeconomic systems of a country indicate the degree of technological and cultural progress. This development requires an organized and planned system in the short, medium, and long term; In addition, good management of renewable and non-renewable natural resources, so that this system provides society with the results it expects, therefore, it must have a set of standards that regulate production systems based on objectives and real and objective policies directed from the State for this sector are efficient.

Consequently, energy is a product that is commercialized, and, in this sense, commercial law regulations will be applied to it; But it must also be taken into account that energy comes from natural resources that are considered in some cases public heritage and in others, as property of the State, so it will be necessary to develop norms corresponding to Property Law (Hernandez, 2011). In this context, the regulations will regulate and guide where production actions should or should not be carried out; since it must be articulated between the needs for growth, respect for natural resources and biodiversity. Therefore, the objectives and State policies are located in the legal field, attenuating the diversity of opinion among national and international investors.

Therefore, this article will allow to know and understand the current regulations related to energy management in Ecuador. Because the evolutionary process, in terms of national and international regulations, goes hand in hand with the political, socioeconomic and financial changes that occur worldwide, specifically in Latin America, they generate a certain lack of control in the legal frameworks and energy regulations. At the Latin American level, there is a Legal Energy Information System (SIEL), which organizes strategies and lines of action to support the integration, updating and permanent dissemination of the energy legal system of the region. This regulatory system of the energy sector, in the context of the political vision, constitutes an important basis for the analysis of the sector, in addition to decision-making for investments and new ventures, which constitutes a relevant basis for the development of studies on energy analysis (Olade, 2021).

In the same way, to have a good understanding of the subject it is necessary to know the regulatory processes, in terms of energy. In this sense, the Constitution of the Republic of Ecuador, in article 14, recognizes the right of the population to live in a healthy and ecologically balanced environment, which guarantees sustainability, good living and declares the preservation of the environment of public interest, the conservation of ecosystems, biodiversity and the integrity of the country's genetic heritage, the prevention of environmental damage and the recovery of degraded natural spaces.

The article establishes respect for the environment and the biodiversity of renewable natural resources and the good life of people through efficient services.

Currently the electricity sector is considered a strategic area of the Ecuadorian State since the inhabitants give great importance to electricity as a service and right. Therefore, the need to strengthen this sector is essential, taking change measures that increase the level of efficiency of each process in the electricity sector. Derived from the previous considerations, a review of the regulations is made, due to their importance for the nation. For this, the different opinions expressed in scientific studies on the current regulations that currently govern this system in Ecuador were compiled. The general objective of this documentary research is to analyze the current regulations related to energy management in the country, as well as the current state of the electricity sector.

Conceptual contextualization

According to Fernández (2016), electrical energy is a vital force in modern society that originates from the difference in electrical potential between two specific points, which are placed in contact through an electrical transmitter, this contact generates a current electricity based on the transmission of negative charges, up to its point of consumption. On the other hand the Electricity Sector Regime Law, defines electrical energy in its article 8, which establishes that for legal and contractual purposes this energy is declared a strategic asset, with the scope for effect of the problems economic (Palomares & Aristizabal, 2016).

The Ecuadorian electricity sector has as general objectives the generation, transmission, and distribution of electric power in a safe and efficient way. It should be noted that the development of the electricity sector allows the economic growth of a country and is reflected in the well-being of the population; In addition, the State has the duty to satisfy the needs of electrical energy, through the optimal use of natural resources (Arconel, 2015). One aspect to consider is related to the institutional structure of this sector in the country, whose governing body is the Ministry of Electricity and Renewable Energy (MEER), responsible for meeting the needs of electricity. Another relevant organization is the National Electricity Council (CONELEC), in charge of regulations in the electricity sector, which also dictates regulations, ensures compliance with the regulatory legal provisions and technical electrification standards of the country in accordance with the national energy policy, approves the concessions for the use of renewable energy resources and establishes the price of these energies.

In this same institutional order, there is also the National Center for Energy Control (CENACE), it is an organization that includes all generation, transmission, distribution companies and large consumers and the administration of technical and financial transactions of the Wholesale Electricity Market (MEM) of Ecuador, in accordance with the regulations promulgated for the Electricity Sector. In 2008, from the approval of the Constitution of the Republic of Ecuador, a process of restructuring of the electricity companies began, forming new companies to manage the electricity sector, from this process the National Electricity Corporation (CNEL) was born.) and the Electricity Corporation of Ecuador (CELEC) (Muñoz, 2008).

The latter is responsible for the generation, transmission, distribution, marketing, import and export of electricity. In addition, it complies with the activity of

association with natural or legal persons to execute projects and participates in scientific and technological research in the field of construction, design and operation of electrical engineering works. At an international level, Hernández (2019), states that there is the Legal Energy Information System (SIEL), as a Means for the Integration and Dissemination of Energy Regulations (OLADE) and its Member Countries established the importance of having updated and reliable information on different aspects of the energy sector or linked to it. In this system, one of its members is Ecuador (Del Pozo, 2019).

Among the topics considered of greatest interest, there is information on legal and regulatory frameworks, possibly in response to recognition by the States, the need to strengthen their role and capacity as a regulatory and control entity is raised. Based on these requirements and according to a generic mandate to contribute to the sustainability and integration of the energy sector in Latin America and the Caribbean. The development and implementation of the Legal Energy Information System was carried out by OLADE, with the aim of becoming an agile and reliable information tool, carried out based on current legal and regulatory frameworks that govern energy activities in the member countries of the organization.

In general terms, SIEL's objectives have been set to have appropriate, useful, reliable, and timely information to promote better decision-making and enrich the participation of non-traditional actors in decision-making processes, to improve the transparency of decisions. actions of energy actors, and in the specific case of legal information, favor the processes of review and adaptation of laws and regulations, as well as greater and better compliance with legal and regulatory provisions, including the involvement of civil society in official compliance efforts.
Renewable sources of energy are those energies that do not run out over time. These sources are an alternative to traditional sources and produce a minimal environmental impact, for a clean, efficient, safe and autonomous energy future. That is why improving the quality of life implies an increase in energy consumption, in such a way it is necessary to create projects in sustainable and sustainable development, respecting the environment, significantly reducing the depletion of resources by the current model of energy consumption (Vazquez, Rodríguez, Saltos, Rodríguez, & Cuenca, 2018).

Renewable energies invite a rational evaluation of energy consumption, with criteria of saving and efficiency, therefore, it is important not only for highly developed countries, but also in developing countries. This leads to raise about the use of renewable resources with protection of the environment and within preservation schemes, reduces environmental problems due to pollution (Jurado et al., 2017). In recent years, several factors have influenced the growth and development of these energies, the first being the growth of technological scientific progress, in the field of energy creation systems, specifically electrical energy, through solar cells or systems wind power, which reduces national electricity consumption if applied in rural and business areas. In the country it can be used to produce electrical energy, largely due to the good geomorphological, topographic, geographic location conditions and solar radiation (Rodríguez et al., 2018). That is why, for several years, many rulers in Ecuador have proposed policies to take advantage of the great water resource in order to exploit and

balance the two slopes that have hydroelectric potential in the country (Rivera & Vallejo, 2016).

Materials and Method

The general objective leads to a documentary investigation that was carried out in times of confinement that made it difficult to collect direct information due to social distancing. According to Universidad Pedagógica Experimental Libertador it relies on prior information and data disclosed by printed, audiovisual or electronic media, its originality is reflected in the approach and in the thinking of the author, which in this case, is carried out carry out an analysis of the current regulations related to energy management in the country, within the aspects related to the description of the structure of the electricity sector in Ecuador and the regulations applied for the management of electrical energy.

The design is not experimental or ex-post-facto, according to Hernández, Fernández, & Batista (2010), because the variables are not manipulated: current regulations of the electricity sector and energy management. It is also transactional or cross-sectional because the study is done in a single time, only an energy reality is analyzed and no follow-up would be done in the event of possible changes in any of the variables.

Analysis and Discussion of the Results

National and international energy laws help guide the regulatory processes to be fulfilled in any event where laws, norms and regulations at the State level are involved, they channel the duty of government action. On the other hand, the renewable resources that are used mainly for the generation of electricity, the most relevant being hydropower, in some cases geothermal energy and nuclear energy. In recent years, regulations on unconventional sources have been incorporated into the legal regime of some countries, especially for biomass and solar energy. Therefore, it is a broad topic, and for this reason, legal documents are analyzed to achieve an effective logical-rational understanding.

The first regulation to analyze is the Electricity Sector Regime Law, which establishes the responsibility of the State to satisfy the needs of electric power directly or indirectly in the country, since it is a public utility service of national interest; in addition to being the only one that can grant concessions and permits in all generation, transmission, and distribution processes. Therefore, they will be regulated under the environmental protection approach. In this same order, in the scope of application, this law regulates the activities of generation of electrical energy that originates in the exploitation of any type of energy source, when the production of electrical energy is placed totally or partially in the National Interconnected System, or in a distribution system and the public services of transmission, distribution and commercialization of electrical energy, as well as its import and export. All these activities and services may be delegated to the private sector in accordance with the provisions of this Law.

It should be noted that the electrification policy corresponds to the President of the Republic, through the Ministry of Energy and Mines, in terms of the

formulation and coordination of the national policy of the electricity sector, as well as the preparation of the Master Energy Plan of the In the country, for the development and execution of the electricity sector policy, the State will act through the National Electricity Council. All of the above makes it possible to state the existence of a control by the State of the National Electric Service, where the government of the day has the power to modify structures, rules and procedures, which can generate a certain lack of control in the system, due to the fact that the Continuous improvement process of a company should not be modified, if it is already strategically planned in the medium and long term, any alteration can damage some of the processes and as it is part of a system, this can corrupt the total system.

As for the Organic Law on Energy Efficiency, it establishes the legal framework and operating regime of the National Energy Efficiency System and the promotion of the efficient, rational and sustainable use of energy in all its forms, in order to increase the country's energy security, since the more efficient the system, the more energy productivity increases, in addition to promoting the competitiveness of the national economy, building a culture of environmental sustainability and energy efficiency, contributing to the mitigation of climate change and guaranteeing the rights of people to live in a healthy environment and to make informed decisions (National Assembly, 2019). It is also observed in this law that the principles emanate from the Constitution of the Republic and international instruments ratified by Ecuador; among them are the rationalization of energy consumption and preservation of energy resources, improvement of productivity and competitiveness through the reduction of costs due to efficient use of energy, promotion of clean energy and reduction of greenhouse gas emissions, promotion of a national culture oriented to the efficient use of energy resources, and transparency and adequate information for consumers and decision makers reflected (National Assembly, 2019).

In addition to this, it establishes in this law that the National Energy Efficiency System of the country must be considered as the set of institutions that groups political actions, plans and investment programs structured for the fulfillment of the objectives and goals established in the National Plan of Energy Efficiency (National Assembly, 2019). It should be noted that the competences based on public energy efficiency policies can be carried out by the national statistical system, in order to lead the strategies between the public and private sectors for the promotion associated with competitiveness, with criteria of sustainability and sustainability. ; establish mechanisms so that citizens have clear and detailed information that in the acquisition of energy goods or services, allows them to make efficient, responsible and economic decisions, within the institutional, legal and regulatory, planning policies, projects and financial economic (Thakur & Geisen, 2019; Hayden et al., 2014).

Regarding the functions of the National Energy Efficiency Committee, it can be indicated, among them; regulate the internal operation and adopt the necessary decisions for the fulfillment of its purposes, coordinate the operation, periodically evaluating the performance and results of the policies and objectives of the plans, as well as the investment plans and programs implemented for their fulfillment and propose the changes or reforms that are necessary. Articulate the

development of national, intersectoral and inter-institutional policy proposals on energy efficiency and rational use of energy and establish the necessary policies to increase energy productivity in the different energy supply and demand sectors (Turner & Filella, 2021; Riesz et al., 2015).

In addition to articulating the elaboration of the strategies and actions that each member, as coordinator of their sector, and discussing them within the Committee for their subsequent incorporation as inputs for the integration of the plans, monitoring and evaluating compliance with the Committee's decisions and the progress in the execution of the programs and initiatives approved within the framework of the plans, for timely decision-making with a view to meeting the goals established in the plan, defining the guidelines for the preparation of energy efficiency programs and projects, as well as for its monitoring and evaluation, promote the development of local and technical capacities in society on the responsible and efficient use of energy, prioritize, based on the methodology established in the regulations of the law, projects and or programs of energy efficiency and rational use of energy, to be financed by the national fund for investment in energy efficiency , verify and evaluate the operation of the national fund for investment in energy efficiency in order to meet the objectives of the plans (Elliston et al., 2014; McGill et al., 1992).

From the perspective adopted here, every efficiency process involves the existence of quality control and energy productivity, this contributes to optimizing the systems, because control and supervision are administrative tools of efficiency, in them is the progress of processes, in terms of efficiency and effectiveness. In addition, to be aware of production lags that may alter national electricity consumption. This law gives the National Government a pillar in energy performance (Mahoney, 1995; Bouwer, 2000; Mora Triana, 2018). Another important regulation is the General Regulation of the Electricity Sector Regime Law; This regulation establishes the rules and procedures, both for the generation, transmission, distribution and commercialization of electrical energy. It is established that the State will promote the use of renewable, non-conventional energy resources, through the priority allocation of the Marginal Urban Rural Electrification Fund, by the National Electricity Council, who will introduce these elements in the Electrification Master Plan as a defined program (Pérez et al., 2016).

Regarding the regulations of the National Electricity Council that incentivize renewable energies in Ecuador, there are the following:

- Establish the specific regulatory parameters for the establishment of a single rate that must be applied by electric distribution companies, for each type of energy consumption. electric power (reg. 006/08).
- Establish the procedures to present, qualify and approve the Marginal Urban Rural Electrification Fund projects, the National Electricity Council will determine annually the maximum amount of the fund's resources that may be assigned to each of the electricity distribution companies. In its chapter III, Pre-allocation of resources and presentation of projects. The allocation of resources is indicated by a reserve of 7.5% of the fund budget for the border provinces, Amazonia and Galapagos. In addition, it includes that projects with renewable energies may be presented by development

organizations before the Committee, when said project cannot be attended by networks, nor has it been considered by the Electricity Distribution Company of the area as a non-renewable energy project . (reg. 001/08).

- The operation of the electricity market. The following scopes are mentioned for this regulation since it will define the commercial rules for the operation of the market, establishing the regulations for regulated contracts between market participants, through a process of transition of the market model. (reg. 006/08).
- Define the methodology for determining the terms and prices to be applied for generation and self-generation projects developed by the private initiative, including those that use renewable energy. (Res. 022/11).
- Establish the requirements, prices, period of validity, and form of dispatch for the electrical energy delivered to the National Interconnected System and isolated systems, by generators that use non-conventional renewable sources. (Res. 023/11).

From the analysis of the laws, the regulations of the National Electricity Council encourage renewable energies in Ecuador, because it establishes specific regulatory parameters for the establishment of a single tariff that must be applied by the electric distribution companies for each type of energy. electrical energy consumption. It is also observed that there is a market share with preferential dispatch for generation plants that use renewable energies, in addition, dispatch may not exceed 6% of the installed and operating capacity of generators in the electricity market. If the 6% is exceeded, the State will assume the production costs of these generators and it will be compulsorily included in the General State Budget.

Returning to the previous topic, the National Development Plan for Good Living has 12 National Strategies and 12 National Objectives, related to renewable energies, where the guarantee of the rights of nature is expressed to promote a healthy and sustainable environment that manifests the following: “We promote respect for the rights of nature. Pacha Mama gives us sustenance, gives us water and fresh air. We must live with it, respecting its plants, animals, rivers, seas and mountains to guarantee a good life for the next generations”. (Res. 001/09). Also including the policy of diversifying the national energy matrix, promoting efficiency and a greater participation of sustainable renewable energies. Additionally, the Ministry of Electricity and Renewable Energies establishes the following policies, cited from the Plan.

This plan has to promote the development of hydroelectric projects, in order to maximize the use of the water potential of the different basins, in order to promote and promote the development of renewable sources of electricity generation to achieve the development of rural energization. and urban-marginal electrification. The Constitution of the Republic stipulates that the control of the electrical system is in the hands of the State, that is, the government of the day has the power to modify structures, norms and procedures to the sector, in addition to the right of the population to live in an environment healthy and ecologically balanced, this affects the protection and maintenance of the environment, in terms of its renewable and non-renewable resources.

It is estimated that having a law based on efficiency, symbolizes as a characteristic of the system, that it complies with quality procedures and if not, it gives the Committee the power to generate effective solutions that direct that efficiency. This law allows the control and monitoring of programs, plans, processes, and procedures, in addition to the analysis of regulations regarding the National Electric System sector, with the sole objective of achieving maximum efficiency, in order to provide optimal electrical service. quality.

Conclusion

The regulations of the National Electricity Council that encourage renewable energies in Ecuador, the most relevant is 004/11 that establishes fixed prices in a certain period of time, this positively affects local, regional and national investment, because this service is necessary for people and companies since they maintain a balance in that sector. Renewable sources of energy not only diversify the energy matrix but are also friendly to the care of the environment, as well as being an energy alternative for society that increasingly increases its energy demand and demands better quality services.

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