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LEGAL AND REGULATORY FRAMEWORK FOR GEOHERMAL DEVELOPMENT IN EL SALVADOR

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ABSTRACT

El Salvador geothermal development since 1999 has been under two important general laws and their regulation: Electrical General Law (EGL) and Environmental Law (EL), both applied in parallel. Energy productions regulatory framework applied by LaGeo to geothermal projects has been supervised by Superintendence of Electricity and Telecommunications (SIGET). Environmental legal requirements are supervised by the Ministry of Environment and Natural Resources (MARN), which guarantees compliance of the environmental law and the fulfilment of the regulations. LaGeo, despite being the only geothermal developer in El Salvador, has worked above the standard set by the law, considering within its policies and action plans for environmental education and local human development taking into account international treaties signed by the government. With its years of experience, LaGeo has proposed some important modifications to the regulatory framework mainly on EGL (Decree 460, September 2013), which have been approved by Salvadoran parliament but SIGET monitors all the procedures as always.

1. INTRODUCTION

All the environmental laws and regulations around the world have been created due the high environmental problems and have been inspired by environmental rights and its international principles. But worldwide tendencies including debates and conferences on the environment have contributed to the search for a legal framework to protect the environment and guarantee a better quality of life of the people. The legal and regulatory framework in El Salvador follows these universal rules. It has taken similar models of laws for the energy sector as other Latin American countries.

Since 1999, geothermal development has been under two important laws and their regulation: Electrical General Law (EGL) and Environmental Law (EL), both applied in parallel. Regulatory framework applied by LaGeo to the geothermal projects has been through Superintendence of Electricity and Telecommunications (SIGET) as the regulator for power generation, transmission, distribution, and energy trading, which deals with the public, private and mixed sectors. But

environmental legal requirements are supervised by the Ministry of Environment and Natural Resources (MARN), which guarantees the environmental law and the fulfillment of the regulations.

On next sections it will extend in detail all guidelines that LaGeo must fulfill during the main geothermal activities and what legal expectations shall be taken into account to improve administrative processes. Some final remarks are included also in this report.

2. STRUCTURE OF LEGAL AND INSTITUTIONAL FRAMEWORK IN EL SALVADOR

Under a legal dimension, geothermal development does not have specific legislation or regulations, only scarce declarations within the General Electricity Law and its regulations and an Environmental Law and its regulations. LaGeo as unique developer of geothermal projects in El Salvador, in fulfilling the available rules and depending on the institutional administrative process to obtain legal permits for construction and operation stage has gone a learning process jointly with regulators. Appendix I, presents geothermal project cycle and its general legal and institutional framework in a brief manner.

This section is focused in two parts. Firstly, referred to laws and regulations for geothermal projects as part of energy sector and secondly the responsibility for its application.

2.1 Institutional framework and its functions

The assessment of the management capacity of geothermal resources follows a systemic approach, considering interrelationships between the political, economic, environmental and physical dimensions. Those dimensions are represented by institutions which have been accredited by legislative power.

Figure 1 shows relationship between any developer and different institutions within all project cycle stages. National authorities are in charge for legal requirements application. Some main functions are following:

- *Legislative Assembly* must harmonize the Constitution with secondary laws and the special laws and other provisions governing the institutions, autonomous officers, etc. Currently all the concessions for projects, even for geothermal, require approval by this organ of State.
- *Ministry of Environment and Natural Resources* (MARN) was created as a governing institution and focused on the Agreements, Conventions and Protocols by the United Nations. The vision of this institution is “to direct an effective environmental management through policies and norms and facilitate the sustainable development for Salvadoran society.”
- *General Superintendence of Electricity and Telecommunications* (SIGET) is the regulator for power generation, transmission, distribution, and energy trading, which deals with the public, private and mixed sectors. Structurally SIGET is an appendix of Ministry of Economy. SIGET

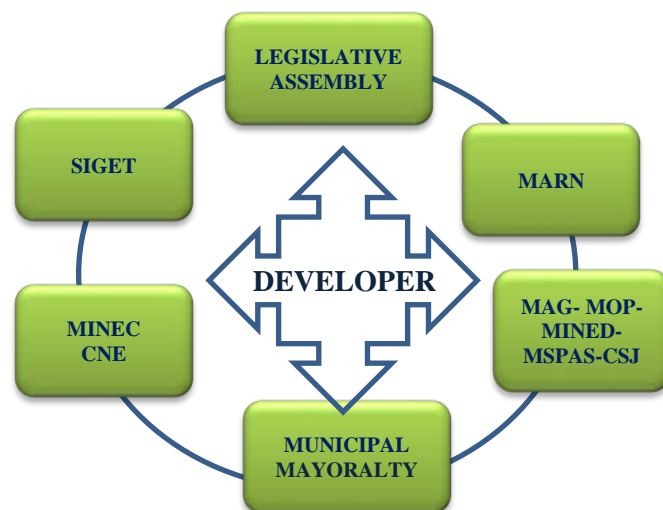


FIGURE 1: Institutional framework for geothermal development in El Salvador (Arévalo, 2016)

stipulates some provisions related to the granting of geothermal and hydroelectric concessions, which facilitate the procedures and permitting for the implementation of small-scale projects based on source energy renewables. Decree 460 in force enacted modifications on EGL and its regulations as mentioned above, but SIGET monitors all the procedures.

- For any construction activities for example, access roads permits, are given by MOP (Public Works Ministry), deforestation permits by MAG (Ministry of Agriculture) and if a demand appears as a consequence of the project, CSJ is involved (Supreme Court of Justice through Environmental Court). Constructions of facilities, taxes and environmental permits are under of the *local mayor coordination*.

2.2 Electrical sector

Regarding renewable energy sources, the main laws have referred to the use of these for producing electricity. In 1945 the Executive Commission of the Lempa River (CEL), an autonomous public service institution was created in order to "develop, conserve, manage and use" energy resources in the country (Decree No. 130 of October 3, 1945). But in 1996 the General Electricity Law, whose main objective is the development of a competitive electricity market in all activities of the subsector (Decree No. 93-96 of 13 November 1996) was adopted. And in 1998 SIGET was created as responsible entity for permits and regulator to the electrical sector.

LaGeo has carried out all its requirements under the General Electricity Law and deals directly with SIGET. Within Articles 5 and 12 EGL; 4, 12 and 51 of the regulations of this law, it was established that electrical generation from hydro and geothermal resources, require concession granted by the SIGET, these concessions being permanent and transferable in nature. The awarding of the concession requires that the developer presents to SIGET with an environmental impact study in prefeasibility stage, previously approved by the Ministry of the Environment and Natural Resources (MARN).

According to Decree 460 dated September 2013, approved by the Legislature, General Electricity Law and its regulations articles above mentioned, were declared unconstitutional by Supreme Court of Justice and determined general provisions and the main functions of SIGET. These substantive changes concerning to the administrative process are based Art. 117. According to the Constitution, it is the duty of the State to protect natural resources and the diversity and integrity of the environment to ensure sustainable development. And it declares the social interest of the protection conservation, rational utilization, restoration or replacement of natural resources.

2.3 Environmental framework

Environmental regulations in El Salvador is structured in pyramid form where the Political Constitution determines basic guidelines for the development of a state policy on natural resources and the environment, which have resulted in the development of the Environment Act, in force since 1998. See Figure 2 and blue numbers in hierarchy way means as follows:

- Political Constitution;
- Laws and international treaties;
- Regulations and special



FIGURE 2: El Salvador legal framework structure (from C. Nájera)

regulations; and

- Decrees, municipal ordinances, technical rules, administrative decisions, others.

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The national environment policy and natural resources act (water, air, biodiversity, etc) were declared official in 2000.

All of these became instruments for the public and private sector to rely on a legal framework for environmental management. Among environmental regulations applied to different projects depending on scope and its nature. Which are:

- Environmental law and regulations;
- Protected Natural Areas Act;
- Law on Wildlife Conservation Forestry;
- Law on Wastewater;
- Special Technical Regulation;
- Regulations on Environmental Quality Standards Special;
- Regulation on Hazardous Special Wastes Control;
- Regulation of Substances Depleting the Ozone Layer; and
- Special Regulations on Integrated Management of DS.

2.4 Environmental law and regulations applied in geothermal development

El Salvador environmental law, and its regulations, was made official in 1998, and in accordance with Article 1 the purpose is to develop the provisions of the Constitution of the Republic, which relates to the protection, conservation and restoration of the environment; sustainable use of natural resources to improve the quality of life for present and future generations; as well as, regulating environmental management, public and private, and environmental protection as a basic obligation of the State, municipalities and inhabitants in general; and ensure the implementation of international treaties or agreements signed by El Salvador.

Instruments of environmental policy according to EL, Art 2 are following:

- a) Environmental management within the national or regional development plans;
- b) **Environmental Assessment; Art. 14 – Art. 47;**
- c) Environmental information;
- d) Public participation;
- e) Environmental education and training; and
- f) National environmental strategy and action plan.

However, most common articles for environmental management in geothermal projects are linked to Art. 16. The environmental assessment process has the following instruments:

- a) Strategic environmental assessment;
- b) **Environmental impact assessment (EIA);**
- c) Environment programme;
- d) Environmental permit;
- e) Environmental diagnostics;
- f) Environmental audits; and
- g) Public consultation.

Article 21, f) of the Environmental Law requires the submission of an environmental impact assessment study for electricity generating power plants based on nuclear, thermal, geothermal, hydro, wind and tidal energy regardless of their size. However, progress in the categorization of projects as a tool for environmental analysis allows the evaluator to determine how significant the project is.

Environmental impact assessment (EIA) is the process of assessing the likely environmental impacts of a proposal and identifying options to minimize environmental damage. The main purpose of EIA is to inform decision makers of the likely impacts of a proposal before a decision is made. EIA provides an opportunity to identify key issues and stakeholders early in the life of a proposal so that potentially adverse impacts can be addressed before final approval decisions are made.

Categorization is based on Article 22 of the Environmental Law where the final part states that the Ministry categorizes the activity, work or project, according to size and nature of the potential impact", which in turn is based on the list of activities, work or projects requiring a study on Environmental Impact, according to Article 21.

It should be noted that the scope of an activity, work or project refers to the size, volume or extension, and the nature of the potential impact is related to the sensitivity of the site or condition of the environment where it is required to construct and the type or nature of activity, work or project to be undertaken.

According to a United Nations the main advantages and benefits of EIA are:

- Improved project design/siting;
- More informed decision-making;
- More environmentally sensitive decisions;
- Increased accountability and transparency during the development process;
- Improved integration of projects into their environmental and social setting;
- Reduced environmental damage;
- More effective projects in terms of meeting their financial and/or socio-economic objectives;
- A positive contribution toward achieving sustainability.

3. INTERNATIONAL LEGISLATION / CONVENTIONS

3.1 International treaties or agreements signed by El Salvador

El Salvador also follows an international guidelines signed by government according international treaties and conventions. Those that could have implications on the geothermal development include among others:

- The United Nations Framework Convention on Climate Change (UNFCCC);
- Kyoto Protocol 1997;
- Convention for Biological Diversity;
- The Ramsar Convention on Wetlands;
- Convention on the Protection and Promotion of the Diversity of Cultural Expressions;
- Convention for the Safeguarding of the Intangible Cultural Heritage, 2003;
- Cartagena Protocol on Biosafety to the Convention on Biological Diversity; and
- Convention concerning the Protection of the World Cultural and Natural Heritage.

According, Art. 144. Of the Constitution, International treaties signed by El Salvador with other States or international organizations constitute laws of the Republic.

Recently El Salvador adopted in September 2015 the Agenda 2030 for Sustainable Development, which establishes a transformative vision towards economic, social and environmental sustainability of the 193 Member States that signed in UNGA (United Nations General Assembly) and will be the reference guide for the work of the institution in pursuit of this vision over the next 15 years. This new roadmap presents a historic opportunity for Latin America and the Caribbean, as it includes high-priority issues for the region, such as reducing inequality in all its dimensions, inclusive economic growth with decent work for all, sustainable cities and climate change, among others.

“We are presented with an opportunity to decide in concert a new way to improve the lives of our peoples.” He added the President of El Salvador during his speech in UNGA.

4. BEYOND LEGAL FULFILLMENT

LaGeo has gone beyond the legal fulfillment with its own synergy vision to all the employees, shareholders, suppliers, etc., through an environmental policy which philosophy is taken in account in all activities to improve environmental performance. Among others LaGeo makes frequent internal audits as well as environmental education programs are priority for all geothermal projects. Uses international conventions and protocols to obtain environmental incentives that contribute to position the company nationally and internationally.

Air, water and soil quality monitoring programme as part of the risk analysis on geothermal activities is a tool for the environmental management operation that guarantees the fulfilment of both the Environmental Law and LaGeo’s company policies.

5. FINAL REMARKS

As for the legal permits for concession of geothermal areas through SIGET or for all construction, operation or expansion of the power plant permits, the Environment Ministry requires lots of time in processing, in most cases, delaying the development plans and economic impacts for the developer.

Different experiences have passed by LaGeo as geothermal developer because regulators change administrative processes according their own interpretations of the Law or political circumstances. Lessons learned have demonstrated that the developer must never lose a continuous communication and persistence in fulfilling legal processes with the regulator entity.

It is expected substantial changes of the legal framework in force in the next decades because the international community is promoting serious commitments to protect the planet from the hazards of climate change.

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REFERENCES

Arévalo, A.S.A, 1998: Environmental aspects of the Berlín Geothermal Power Station in El Salvador. Report 2 in: *Geothermal training in Iceland 1998*. United Nations University Geothermal Training Programme, Reykjavík, Iceland, 26 pp.

Arévalo, A.S.A., 2007: Environmental management in geothermal development: Case history from El Salvador. Papers presented at “*Short Course on Geothermal Development in Central America: Resource Assessment and Environmental Management*”, organized by UNU-GTP and LaGeo, San Salvador, El Salvador, 6 pp.

Arévalo, A.S.A. and Barrios, L., 2009: Environmental issues in geothermal exploration in Central America. Papers presented at “*Short Course on Surface Exploration for Geothermal Resources*”, organized by UNU-GTP and LaGeo, Ahuachapán and Santa Tecla, El Salvador, 12 pp.

Baba, A., 2003: Geothermal environmental impact assessment with special reference to the Tuzla geothermal area, Canakkale, Turkey. Report 5 in: *Geothermal training in Iceland 2003*. United Nations University Geothermal Training Programme, Reykjavík, Iceland, 40 pp.

Beder, S., 2003: *Environmental impact assessment*. Sharon Beder, webpage: <http://www.uow.edu.au/~sharonb/STS218/eis/background/purpose.html>

CEPAL, 2016: *Agenda 2013 and the Sustainable Development Goals: An opportunity for Latin America and the Caribbean* (in Spanish). Economic Commission for Latin America and the Caribbean, webpage: <http://www.cepal.org/es/publicaciones/40155-agenda-2030-objetivos-desarrollo-sostenible-oportunidad-america-latina-caribe>

Franco, L. and Arévalo, A.S., 2011: Environmental considerations for geothermal drilling in El Salvador. Papers presented at “*Short Course on Geothermal Drilling, Resource Development and Power Plants*”, organized by UNU-GTP and LaGeo, Santa Tecla, El Salvador, 7 pp.

Presidency of the Republic of El Salvador, 2016: *El Salvador adopts UN agenda for sustainable development 2015-2030*. Presidency of the Republic of El Salvador, San Salvador, El Salvador, webpage: <http://www.presidencia.gob.sv/el-salvador-adopta-agenda-de-desarrollo-sostenible-2015-2030-de-la-onu/>

Rodríguez, J.A. and Arévalo, A.S., 2007: Environmental aspects of geothermal utilization: A Central American perspective. Papers presented at “*Short Course on Geothermal Development in Central America: Resource Assessment and Environmental Management*”, organized by UNU-GTP and LaGeo, San Salvador, El Salvador, 7 pp.

APPENDIX I

ETAPAS DEL CICLO DE UN PROYECTO GEOTERMICO			
RECONOCIMIENTO	PREFACTIBILIDAD	FACTIBILIDAD	DESARROLLO
<p>Objetivo: Visualizar indicadores de la existencia de un sistema geotérmico</p> 	<p>Objetivo: Cuantificar los parámetros del sistema geotérmico y planificar la etapa siguiente. Estudios en superficie y perforaciones exploratorias (3 pozos multipropósito)</p> 	<p>Objetivo: Delimitar la frontera del sistema y definir los sitios de potencial geotérmico para obtener >50% de vapor. Elaboración Doc.de factibilidad completo (5 pozos de Dcomercial)</p> 	<p>Objetivo: Construcción de la Central, sistema de acarreo, perforación de pozos productores, reinyectores y reposición; Sub estación - líneas de transmisión</p> 
<p>Objetivo: Operar la central y optimizar el manejo sostenible del recurso.</p> 			
<p>Desarrollador del proyecto</p> <p>Concesión del campo</p>	<p>Asamblea Legislativa -SIGET</p>	<p>Desarrollador del proyecto</p> <p>MARN - MAG- SIGET-Alcaldías-MOP</p> <p>Permisos - Autorizaciones</p>	<p>Desarrollador del proyecto</p> <p>MARN - SIGET</p> <p>Licencia para operar- Monitoreo</p>
P O B L A C I O N			