Inventory of geothermal sources in the DRC and their development plan for the electrification of locals areas. Case of the eastern part of the DRC

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Abstract. The Democratic Republic of Congo is a vast country with plenty of the natural resources which are all taken into account to meet the country's economy. In the energy sector, only hydroelectric energy is the main one with the Inga dam, which covers most of the needs of the DRC. As a vast country; the Inga dam is not able to cover the whole country by its capacity and cost, taking into account its geographical location. It is known that DRC has important hydrothermal vents through its extensive that deserve to be studied and developed to contribute to its development and investment attraction.
DRC by its geological and tectonic history has experienced several tectonic events that led to the development of a system of fracturing which contributes to the flow of hydrothermal fluids. These sources are present in majority provinces as part of the country (North Kivu, South Kivu, Maniema), the south (Katanga). As belonging to the region of east-African rift with young deformations and active volcanic area, these systems become real drivers that work and enable DRC to develop geothermal projects in order to boost his economy sector.

Keywords: Geothermal, electrification, DRC

1. Introduction
The Democratic Republic of Congo is one of large countries in Central Africa where there is occurrence of best mineral deposits, forests, climates, rivers, fauna and flora of world and also whose population has been growing over the years. This population growth has been in line with the growing energy demand. The total access to electricity for the whole country stands at only 9% and the majority of rural areas is in the dark situation. All the energy sources in DRC are provided by hydroelectric dams mainly sourced by Inga dam with some thermal dams contribution, whereas DRC has all opportunities to develop others energy sources.

The Eastern part of DRC is one of the most interested region because it is an important area of DRC where we can find the best mineral deposits of world, the volcanic activities facilitate agricultural activities, the best national parks of fauna and flora important for environment protection, the rift system developed associated to geothermal sources enable to product electricity. Unfortunately this part of DRC is not electrified and remain in the dark situation.
Belonging to the East African Rift, DRC is a precious region of Africa in which the geothermal sources are distributed and presents in the eastern part along the west branch of East Africa Rift. In this paper, The focus is on the inventorying of all the geothermal resources in DRC and try to provide a development plan for the future electrification of this local area in order to constitute a database of geothermal system which is important for a partnership between Government and private and fixed to valorize this kind of energy used in the past but now neglected in the Government planning of the sector.

2. Status of electricity production of DRC

2.1. Electricity sector

Hydroelectricity energy in DRC is the main source of energy assisted by thermic energy. The electric production, transport, distribution and commercialization activities in DRC as well as outside are conducted by the main national operator named SNEL (National Society of electricity). Apart from this, there are the auto-producers which produce electricity for their own consumption in the rural areas. Case of some non-governmental organizations, religious group, individual and private society counting 124 MW.

Recent data in energy assessment (CNE, 2010) talked about 95% of energy in DRC coming from biomass, 3% from electricity and 2% from petroleum products (figure 1).

Figure 1. Data showing the energy distribution in DRC (CNE, 2010).

DRC has about 89 electric power plants whose hydroélectric power plant and thermic power plant with a total installed power of 2590.239 MW (table 1). The majority of electric power is produced by the National operator with 2446.2 MW either 95% of national production.

| Provinces                        | Power Plant Number |
|----------------------------------|--------------------|
| Mayi ndombe, Kwilu et Kwango     | 5                  |
| Kongo central                    | 9                  |
| Equateur                         | 10                 |
| Kasaï-Occidental                 | 7                  |
| Kasaï-Oriental                   | 9                  |
| Katanga                          | 22                 |
| Nord-Kivu                        | 4                  |
| Maniema                          | 8                  |
| Province Oriental                | 11                 |
| Sud-Kivu                         | 4                  |
| **Total**                        | **89**             |

(1) SNEL report, Production, June 2013 (extract to CNE report, 2005).

However, about half of this production is in a run out situation, the transport and distribution networks are very old. The electricity service is provided with interruption due to ancient equipments,
overloading of transport and distribution networks and unavailability of some generators in the electricity production park (table 2).

Table 2: Hydroelectric power plants and their electric capacities in DRC

| Power Pant   | Turbine installed | Turbine operating | Capacity installed (MW) | Capacity available (MW) |
|--------------|-------------------|-------------------|--------------------------|-------------------------|
| Inga I       | 6                 | 3                 | 350                      | 175                     |
| Inga II      | 8                 | 3                 | 1424                     | 534                     |
| Zongo        | 5                 | 1                 | 75                       | 13                      |
| Mpozo        | 2                 | 0                 | 2.21                     | 0                       |
| Nsanga       | 6                 | 1                 | 11.50                    | 2                       |
| Nseke        | 4                 | 1                 | 260                      | 65                      |
| Nzilo        | 4                 | 4                 | 108                      | 108                     |
| Koni         | 3                 | 2                 | 42.1                     | 28.08                   |
| Mwandingusha | 6                 | 6                 | 68                       | 68                      |
| Kilubi       | 3                 | 1                 | 9.90                     | 3                       |
| Ruzizi I/II  | 6                 | 6                 | 37.4                     | 37.4                    |
| Tshopo       | 3                 | 2                 | 18.80                    | 12                      |
| Mobayi Mbongo| 3                 | 3                 | 10.5                     | 11                      |

(2) Source: Cahier sectoriel ANAPI – RDC: Investir dans l’électricité, 2016 p22.

Three networks are recognized in DRC which deserve all the country and cover 9% of national electricity rate (figure 2):

- West network, the most important whose Inga dam with 40 GMW is the main dam associated with others small dams (Zongo, Mpozo, Nsanga). This network deserve the western part of DRC (Kinshasa, Kongo, Kwilu Provinces) and the South-east part (Katanga Province).
- South Network represented with Nseke, Nzilo and others dams deserve only Katanga Province.
- East Network represented by Ruzizi dam and deserve the eastern part (Bukavu and Goma).

Figure 2. HT electric Network in DRC and theirs hydroelectric sites (Ministère de l’énergie, 2011).

2.2. Electricity sector assessment
The identified lower rate of electricity (9%) cannot be able to serve all the country and is distributed across the country as described in the table 3 below:

**Table 3:** Distribution of electricity per Provinces in DRC\(^3\).

| Provinces                     | Electricity rate (%) |
|-------------------------------|----------------------|
| Kinshasa                      | 44.1                 |
| Kongo central                 | 9.7                  |
| Mayi ndombe, Kwilu et Kwango  | 0.6                  |
| Equateur                      | 1.4                  |
| Maniema                       | 3.1                  |
| Nord-Kivu                     | 7.9                  |
| Sud-Kivu                      | 0.5                  |
| Kasaï-Occidental              | 3.6                  |
| Prov. Oriental                | -                    |

(3) Atlas du Ministère des ressources hydrauliques et électricité, Kinshasa, 2014

Following the population growing, the demand of energy has galloped and the projections made by the energy Ministry show a total demand of energy in DRC can reach 3059 MW from now up to 2025 (table 4).

**Table 4:** Prognosis of electricity demand per Provinces in DRC (MW)\(^4\)

| Provinces           | 2013-2014 | 2015-2016 | 2017-2018 | 2019-2020 | 2021-2022 | 2023-2024 | 2025 |
|---------------------|-----------|-----------|-----------|-----------|-----------|-----------|------|
| Nord-Kivu           | 55-58     | 61-64     | 66-69     | 72-75     | 78-81     | 85-89     | 93   |
| Maniema             | 8-8       | 8-9       | 9-9       | 10-10     | 11-11     | 12-13     | 13   |
| Sud-Kivu            | 31-32     | 33-34     | 35-36     | 37-38     | 39-41     | 42-43     | 45   |
| Equateur            | 21-22     | 24-25     | 27-29     | 30-32     | 34-36     | 38-41     | 43   |
| P. Oriental         | 60-63     | 65-68     | 71-74     | 77-80     | 84-87     | 91-95     | 99   |
| Kasaï-Occidental    | 34-36     | 38-40     | 42-45     | 48-51     | 54-58     | 62-66     | 71   |
| Kasaï-Occidental    | 46-49     | 52-56     | 60-64     | 68-73     | 77-83     | 88-94     | 101  |
| Katanga             | 770-799   | 829-799   | 826-855   | 886-918   | 952-988   | 1026-065  | 1107 |
| Bas-Congo           | 101-104   | 107-110   | 113-117   | 120-123   | 127-131   | 135-139   | 143  |
| Bandundu            | 49-51     | 54-56     | 58-61     | 63-66     | 69-72     | 75-78     | 82   |
| Kinshasa            | 751-784   | 819-855   | 893-933   | 974-1017  | 1062-1109 | 1158-1210 | 1263 |
| **Total**           | 1927      | 2094-2115 | 2201-2291 | 2385-2484 | 2588-2698 | 2812-2933 | 3059 |

(1) Source: Cahier sectoriel ANAPI – RDC: Investir dans l’électricité, 2016 p28.

When we make a simulation of demand of energy in three scenario (low growth, middle growth and high growth), we can realize that even in the low growing of population and industrialization of DRC, the demand of energy for the ten future years is very high. The graphic below published by The Energy Ministry (2009) shows these three scenario of energy demand in DRC (figure 3).
2.3. **Energy resources in DRC**

The energetic resources in DRC are various, but not all developed. However, the most important are:

- Hydroelectric: 774,000 GWH/year
- Wind: 5 – 6.5 Km/h
- Solar: 3500 – 6750 KWh/m²
- Biomass: 90.5% of primary energy
- Uranium: 1,800 T
- Gas methane: 57 Gm³ (Kivu Lake)
- Petroleum: 1.5 G bbls
- Coal: 720 millions T
- And Geothermal: Not data available

Among all, wind is limited due lack of important wind in DRC.

2.4. **Political electricity investment in DRC**

DRC is open to all private or public investors who need to build their own power plant and need to produce the electricity in order to commercialize in the country wide. The law n° 14/023 of July, 07 2012 talk about this tendency and invites all the investors to participate to the development of this sector.

3. **Status of geothermal development in DRC**

The eastern part of DRC has huge geothermal potential but not exploited until now. Several geothermal sources are found in this part of DRC belonging to the western branch of East Africa Rift. In general, the African rift valley represents an electric potential not yet exploited but can attain 6500 MW [1].

The DRC provinces concerned to this kind of energy are Nord-Kivu, Sud-Kivu, former Katanga, former Orientale Provinces and Kongo Cetrale Province (Mbamba Kilenda, Matamba kanzi and Nkukutu).

However, the geothermal energy has not been deeply studied in DRC; the geothermal potential assessment is a necessity as well as identification of all the geothermal sources in DRC.
3.1. Previous study
In general, the hot springs have not been investigated properly in DRC. The first studies were courried out in 1911 by Bas-Katanga Engineers thereafter in 1949 by a GeoMines in order to use the geothermal energy like source of electecticity of Mine operations. The first geothermal Power Plant was implemented in 1952 at Kiabukwa in Manono Province (ancient Katanga Province). At the time of the project establishment, electricity production was 550.000Kwh per year against the expected 1.400.000Kwh. At present, no progress has been made in terms of geothermal studies in DRC until now.

3.2. Geology
Many hot springs are related to rift-related tectonic activity and the majority of occurrences is located in the rift itself. They belong to the “Albert, Edouard, Kivu, Tanganyika, Moero and Upemba Grabens” group of thermal springs.

Those hot springs occur in western part of Katanga, in the Archaean-Lower Proterozoic Kasai craton (Niamalonga site) and they are considered to be linked to an evaporitic formation in the top part of the Upper Roan, which corresponds to a regressive episode (May site, Katanga).

The belong to the “Southern Katanga” group of thermal springs, occurring in the folded Katangan cover of Upper Proterozoic age (Kaku site, Katanga).

3.3. Geothermal structural setting in Eastern part of DRC
In Kivu, the volcanic activity and numerous geothermal resources appear in the system of fractures of the graben (figure 4).

In the Southwesterly extension of the section of breaks, oriented following the direction Lake Albert - Lake Kivu appear the geothermal resources of the basins of the high Ulindi, the high Elila and the low Luama.

In Katanga, the geothermal resources group themselves related to the tracing of the big graben African centers, along the oriental fractures of the graben of Upemba and according to the field of fractures, again enough definite pain, that connects this last ditch to the graben of the region of the big lakes (Kant M.P., 2014).

Figure 4. The General setting of the East African Rift with sketch of the opening models [3].

3.4. Geochemistry Characteristics
Exhaled gasses can be H2S, CO2, HCO3,... and main components can be MgCl2, CaSO4, NaCl,
K2SO4, SiO2,... Known temperatures range between 20°C and approximately 100°C. Flow rates vary widely from one spring to another.

3.5. DRC geothermal field
3.5.1. Upemba-Moero-Tanganyika geothermal field
Over 100 thermal springs and related salt deposits have been identified in Katanga. However, details are only available over a restricted number of occurrences. They belong to the "Upemba Graben" group of thermal springs.

Three major groups of springs are recognized, based on their relation with the main structural units of the region: those in relation with a) the Upemba Graben, b) the Tanganyka Lake and c) Southern Katanga. The former two are rift-related [4]. These geothermal sources are (figure 5):

3.5.1.1. Kafinga source:
It is a thermal spring characterized by no odour and low salinity. Temperature is about 100°C. Rift-related springs are in general characterized (vs. S-Katanga type) by high temperature and their sulphurous-carbonated chemical composition K.

3.5.1.2. Tumba source:
This rift-related springs are in general characterized (vs. S-Katanga type) by high temperature and their sulphurous-carbonated chemical composition.

3.5.1.3. Niamalanga source:
The source is occurred in westernmost Katanga, in the Archaean-Lower Proterozoic Kasai craton. This thermal spring emerge in a small basin, deposit a kind of granulated calcareous tuff. Waters temperature is between 28°-30°C. No traces of sulphur are visible and relatively the important and continuous flow is observed.

3.5.1.4. Rutuku source:
This source belongs to the "Tanganyka group" of thermal springs and is direct relation to rift systems. It is thermal spring, very weakly mineralized with chloride (0,05 % or 0,083 % NaCl), sulphate, Ca and Na. There is no K, phosphates or sulphur.

3.5.1.5. Nganza source:
This site belongs to the "Tanganyka Group" of thermal springs and has been described in 1911 by a Bas-Katanga engineer. This source is characterized by high temperature and their sulphurous-carbonated chemical composition, exceptions in the Moba area suggest presence of Roan formations. Series of thermal springs, the assays show 2 % NaCl, temperature 38°C.

3.5.1.6. Mulala source:
The source occurs in the extension of the Upemba Graben, to which it may be related. Thermal spring emerging along the flanks of a hill. Two main springs (A and B) exist, spring A : 55°C + SO2 emission and spring B with 58°C.

3.5.1.7. Konkula source:
This hot Spring belonging to the 'Upemba Graben' system. It’s a sulphurous thermal spring with carbonated water, slightly sulphated and chlorinated and with high temperature. This source is characterized by high temperature and their sulphurous-carbonated chemical composition.

3.5.1.8. Kipia-Lubumbumbu source:
This thermal spring emerging over 10 m² of Kibaran schists. Close to the Upemba Graben, to which it may be directly related. It’s characterized by considerable flow, lack of mineral deposit, clear water, no taste. Temperature = 50°C. Rift-related springs are in general characterized by high temperature and their sulphurous-carbonated chemical composition.

3.5.1.9. Kipia-Lubilwe source:
This Hot spring occurring on the heads of a tributary of the Lubilwe river. Close to the Upemba Graben, to which it may be related directly. It’s a thermal spring with a considerable flow and has a surface temperature about 40°C.

3.5.1.10. Kafumwe source:
The source belongs to the "Upemba Graben" group of springs, assumed to be directly related to the rift
system. It’s a thermal sulphur-rich spring (carbonated, slightly chlorinated and sulphated), relatively high temperature.

3.5.1.11. Kai source:
This source has been described by GEOMINES in 1949. It’s a thermal spring with a temperature about 72°C; flow from 20 to 30 m³/hr and slightly alkaline (Na+K=0.10 g/l); SO₃= 0.108 g/l, pH = 8.

3.5.1.12. Kaniamba source:
The Hot spring belongs to the Upemba Graben system. It’s a sulphurous thermal spring, slightly chlorinated, sulphated and carbonated. He has relatively high temperature.

3.5.1.13. May source:
The site belongs to the "Southern Katanga" group of thermal springs, considered to be linked to an evaporitic formation in the top part of the Upper Roan, which corresponds to a regressive episode.

3.5.1.14. Kansonso source:
This Hot spring belonging to the "Upemba Graben" group of thermal springs, directly related to the rift system. It’s a slightly sulphurous thermal spring and in general characterized by high temperature and their sulphurous-carbonated chemical composition.

3.5.1.15. Kaswela source:
It’s a thermal spring belonging to the "Tanganyka group" of springs and is also a slightly sulphurous thermal spring.

3.5.1.16. Kayumba source:
Spring belonging to the Upemba Graben system. It’s a sulfated siliceous thermal spring in general characterized by high temperature and their sulphurous-carbonated chemical composition.

3.5.1.17. Kisabi source:
This site occurs in the Northern part of Lake Moero, in a (smaller) group of thermal springs which may form a 4th rift-related group of springs. It’s a salt-containing thermal spring. It’s a relatively high temperature.

3.5.1.18. Pundu source:
The source belongs to the 'Upemba Graben' system of thermal springs. It’s a sulphur-bearing thermal spring with high temperature and is in general characterized (vs. S-Katanga type) by high temperature and their sulphurous-carbonated chemical composition.

3.5.1.19. Kibimbi source:
The Hot spring occurs close to the 5th parallel. It’s in related to Kibaran and rift-related mechanisms. It’s a carbonated thermal spring, slightly sulphated and chlorinated with a temperature 70°C.

3.5.1.20. Kafungwe source:
This source belongs to the "Upemba Graben" group of thermal springs. It’s a sulphur-bearing thermal spring, carbonated, slightly chlorinated and sulphated. The temperature is from 78 to 84 °C. The rift-related springs are in general characterized by high temperature and their sulphurous-carbonated chemical composition.

3.5.1.21. Kaku source:
This site belongs to the "Southern Katanga" group of thermal springs, occurring in the folded Katangan cover of Upper Proterozoic age. It’s a thermal spring, chlorinated water.

3.5.1.22. Lofoi and Kabila sources: Not data available.
3.5.2. **Kivu-Edouard geothermal field**

In general, the hot springs have not been investigated properly. Many hot springs are related to rift-related tectonic activity. Many occurrences are located in the rift itself. Exhaled gasses can be H₂S, CO₂, HCO₃... and main components can be MgCl₂, CaSO₄, NaCl, K₂SO₄, SiO₂,... Known temperatures range between 20°C and approximately 100°C (figure 6). Flow rates vary widely from one spring to another [5].

3.5.2.1. **Rutshuru source:**
The water temperature is between 45 and 90°C.

3.5.2.2. **Walikale source:**
This site occurs 46 thermal springs in the valley of the Lowa and Walikale. Kolokolo, a spring with H₂S-containing water, is one of them. Interbedded strata at the base of the Karoo (Paleozoic) system.

3.5.2.3. **Mutwanga source:** The thermal water contains H₂S and the water temperature is 43.5°C.

3.5.2.4. **Kasindi source:** Not data available.

3.5.2.5. **Bakoma source:** The water temperature is between 45 and 90°C.

3.5.2.6. **Kalumia and Luama amon sources:** The water temperature is more than 90°C.

3.5.2.7. **Nyawatu and Ruzizi sources:** The water temperature is between 45 and 90°C.

3.5.2.8. **Mabitabo source:** The thermal water contains H₂S and the water temperature: more than 90°C.

3.5.2.9. **Namoya SE source:** The water temperature is more than 90°C.

**Figure 5.** The geothermal sources of Upemba_Moero_Tanganyika Lakes.
3.5.3. Albertine geothermal field
Sixty-one hot springs or groups of hot springs are located in the Oriental province [6]. In general, the hot springs have not been investigated properly (figure 7).

*Semliki source:* Not data available.

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4. General Cartography of the existing geothermal sources

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**Figure 6.** The geothermal sources of Kivu_Edouard_Tanganyika Lakes.

**Figure 7.** Geothermal sources of Albert Lake.
More than 200 Hot Springs are found out in the eastern part of DRC and are mainly associated to the rift activities.

The geothermal resources are also enormous in its Eastern part, notably in the following provinces: Katanga, Maniema, North and South Kivu and Oriental Province (figure 8).

![DRC Geothermal resources Map](image)

**Figure 8.** The geothermal sources in eastern part of DRC

5. **Development plan for a electrification of rural areas**

5.1. **Introduction**

The Eastern part of DRC is one of the areas where there exist the world best deposits of tin, nobium, tantalum, gold, Lithium, wolframite, cobalt, copper and REE are developed. One of the best climate is observed due the high mountain, good soil for agricultural activities consisting of volcanic materials, good savannah for breeding, many parcs and geoheritage places (lakes, mountains, waterfall, volcanoes, …) for tourists.

However, this part of DRC is one of zones which are not completely electrified. All the needs in terms of energy are turned to the forest (95%) such as chaircoal, woods. As a rift region of DRC, more than two hundred geothermal resources are distributed into fractures network from the north to the south and need to be studied properly to developing the green energy (Geothermal energy). The use of Geothermal energy will help DRC to grow his electrification rate and decentralize its electricity sector.

5.2. **Objectives**

This project will let the DRC in:
- boosting the electricity issue (9% for total area) by diversifying the source of energy in the country hanging to hydroelectricity energy,
- being present in big circle of world countries producing the geothermal energy,
- reducing the forest request leading to deforestation of equatorial forest, one of main oxygen source of world,
- Encouraging the small industries, agricultural and breeding projects initiated to the local populations,
- Accelerating the development of this part of DRC by attract some international and national investors, tourists.

5.3. Expected results
This study need to establish the DRC geothermal database capable to attract the investments from some financing banks in order to boost the dark situation raging the eastern part. This result needs the recent field trip to all geothermal resources inventoried in phase 1 in order to update with the new field information. All the data in our possession concerning the geothermal sources are limited and have been studied in geological context especially without the current geothermal energy vision and need to be reworked.

This result obtained will conduct this project to use the green energy by desserving the energy in the important and economic part of DRC (eastern part).

5.4. Project Phases

**Phase 1**: Gathering and integration of geoscience and reservoir data: inventory of all existing hot springs in eastern part and theirs characteristics, The objective of this step is to collect all data stored in the majority of geological Services such as National Geological Services, Ministry of Mine services and Royal Museum of Central Africa in Belgium. (Step already done and concerning these papers).

**Phase 2**: Field trip research (Surface exploration) focusing on identifying the youngest volcanic features and thermal features and their relationships to regional tectonics and local faulting: (target areas: Bunia, Butembo, Goma and Bukavu Sites).

a. Geological studies:
The eastern part of DRC is dominated from the northern to the southern by oldest rocks of country which formed the craton and fractured formation due to rift stress (magmatic and metamorphic rocks). Out of this, we can find out the youngest formations which occupy the Congolese lakes floor and some depression landscape (Sedimentary rocks). The arm of this study is:
   - to do the Mapping of new geothermal resources following the rifting activities in the eastern part of DRC. This mapping will be coupled with Remote sensing methods in order to provide the fault characteristics and distribution of volcanics (Temperature).
   - to study the Inferred structures and state-of-stress of geothermal sites in order the understand the fault Characteristics, likely low and high permeability rock types or paths.
   - to identify hydrothermal alteration (clays cap produced by the hydrothermal event).
   - to understand the Volcanic vent distribution, composition, and age.

b. Hydrology study: make a relationship between the existing rivers and the geothermal sources in the local areas.

c. Geochemistry study: composition and temperature of fluid and gas.

d. Geophysics study: this method will be combined with surface mapping and thermal feature chemistry in order to estimate the likely shape and depth of the system and geometry of Clay Cap.
   - Resistivity (MT, TDEM...).
   - Magnetotelluric, EM, Gravity.

e. Drilling: Shallow wells, where temperature gradients can be measured, provide additional confirmatory evidence.

f. Conceptual model of geothermal system.
The arm of this phase 2 is to have:
   - Sufficient permeability, typically in an interconnected fracture network.
   - Sufficiently high rock/fluid temperature for driving condensing turbines (>240°C) or binary heat exchange systems (>145°C).
   - Fluid composition and pH compatible (fluid chemistry) with flow through steel piping without excessive corrosion or scaling.

**Phase 3**: Prioritizing generation of sites and Research of financing for exploration Drilling.

This phase will allow us to select the good targets according the commercial conditions of geothermal production (temperature, permeability and fluid geochemistry) and deep drilling permitting to discover
the geothermal reservoir. Also, to select the sites in which the hydroelectricity is not possible to be developed, so that the geothermal energy be valorized.

**Phase 4:** Research of partners for Geothermal Power Plant.

This project needs private partners collaboration. According to the vision of government (law n°14/011 of June, 17 2014 published in ANAPI annual report, 2016), private partners can be involved to winner to winner contracts by doing Joint Venture or to be engaged like a production company.

**Phase 5:** Electricity development and distribution.

According to different contracts that will be signed between stakeholders, this project will be held by the Oil, Gas and Renewable Faculty of Kinshasa University as the first initiator and passive actor consecrated to different researches.

In the end of this project, electricity will be desserved to the concerned areas (eastern part of DRC) with possibility to the exportation abroad following the stakeholder decisions and agreement with the DRC Government.

6. Conclusion

Geothermal energy is raw energy in DRC and has not been properly investigated. In spite of the above observations mentioned, the Democratic Republic of Congo has a huge geothermal potential which can contribute largely to the growth of its economy. This kind of resources need the implication of private partners, Universities and research centers for valorizing this resources to real development project.

At present, the government is setting up a special committee for the development of geothermal energy in the DRC.

Oil, Gas and Renewable energy Faculty of Kinshasa University needs cooperation and Financing in order to implement this project.

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