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Study on Renewable of Geothermal Energy in Bangladesh

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***Abstract*: At the present world power generation is the most important fact for the countries and during power generation in conventional way CO2 emissions in a large scale which is burden to the global environment. To reduce emission of CO2, renewable energies can be adapted such as solar, wind, biogas etc. but among these geothermal energy (GTE) has the highest efficiency about 12%. GTE can be used for electricity generation, as heat pump, aquaculture etc. Moreover GTE has negligible CO2 emission and it is clean energy. This paper emphasizes on the modification of GTE plants using CO2 as a working fluid which emits from different reducing global warming phenomena and future prospects worldwide particularly in Bangladesh.**

***Keywords*: Geothermal Energy, Efficiency of Geothermal, how to Convert, Applications, Precepts in Bangladesh and Future in Geothermal.**

I. INTRODUCTION

1. Geothermal energy has two primary sources, primeval heat, and decay. Primeval heat is what resulted from the creation of Earth 4.5 billion years a gone, once the energy and mass from colliding cosmic matter created Earth an outsized, hot piece of house trash. Geothermic virtually means that 'Earth's heat, that is calculable to be 5,500 degrees centigrade at the Earth's core – regarding as hot because the surface of the sun. Resources of heat energy vary from the shallow ground to predicament and hot rock found a number of miles to a lower place the surface, and down even deeper to the extraordinarily high temperatures of liquefied rock known as stone. This power can be a clean, renewable energy that can be effective, reliable, property and environmentally friendly resources, which can be propagated by geographically different countries worldwide. It is the energy generated from the natural heat of the world. The temperature of the earth changes and the temperature is up to 3000 degrees temperature for various temperatures. The heat energyis often used for the production of electricity and is used for temperature and temperature and chemistry directly.
There are chances of helping to reduce the frost if fossil fuel is widely engaged in fossil fuel situ.

2. Geothermal Energy

Geothermal vitality is a sort of "heat-inserted" vitality, and can be utilized straightforwardly without transformation, superior to different kinds of sustainable power source in some degree. In specific cases, geothermal vitality is progressively advantageous to utilize, and would turn into a viable "compliment" vitality for different kinds of vitality. At the point when sustainable power sources are utilized, the interest for petroleum products is diminished [1]
This heat energy, which is known as geothermal energy, can Be found anywhere on earth and can be used in many ways. People use geothermal energy to produce electricity, generate

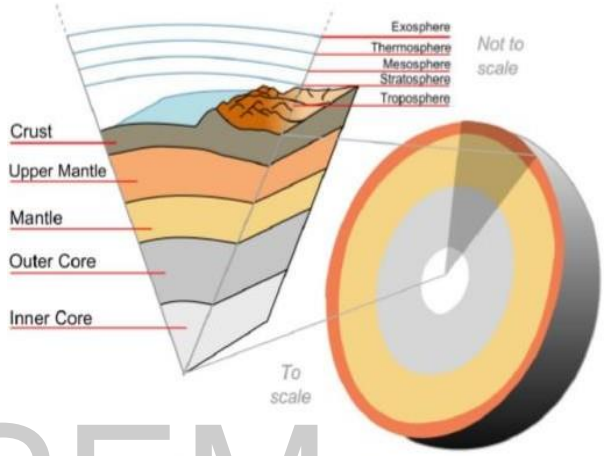

Figure1.1: Earth's temperatures Earth's surface lays and depth in kilometers.

Heat in buildings and greenhouses, and many other purposes. This energy can be produced 24 hours a day in a large scale without emitting any greenhouse gas, which makes it affordable and sustainable solution for reduce the dependence of fossil fuels and the global warming.

Efficiency of geothermal energy

It has been found that using geothermal energy for residential heating and cooling is the most efficient. This efficiency is 50% to 70% higher than the standard heating systems and 20% to 40% higher than present cooling systems. This high efficiency also has very low utility bills [5]
Today's four types of geothermal resources are found – hydrothermal, geo-pressured (i.e. refer to hot brine saturated with methane, has temperature range from 90 - 200oC and found in 3 – 6 km below the surface), hot-dry rock (i.e. 200-300oC hot-dry rocks can be found within 5 km below the surface), and magma (i.e. molten rock found at depths of 3 - 10 km, has temperature range from 7001200oC). Only the hydrothermal is widely in use but the other 3 are in the research stage.

How Geothermal is converted

The Earth keeps life from the sun, and then it gives birth to this lively evening. The temperature of the surface of the surface is only 10 meters outside the Earth. Due to the reduction of the fluid in the center of the Earth's temperature, the temperature of the Earth begins to grow with the progress of the Earth's temperature.

Electricity from Geothermal

Geothermal power activities convert the vitality contained in hot shake into power by utilizing water to ingest heat from the stone and transport it to the world's surface, where it is changed over to electrical vitality through turbine-generators [8], [9]. Water from high-temperature (>240 °c) repositories is incompletely flashed to steam, and warmth is changed over to mechanical vitality by going steam through low-weight steam turbines. A little portion of geothermal age worldwide is created utilizing a warmth exchanger and optional working liquid to drive the turbine [1] [2].

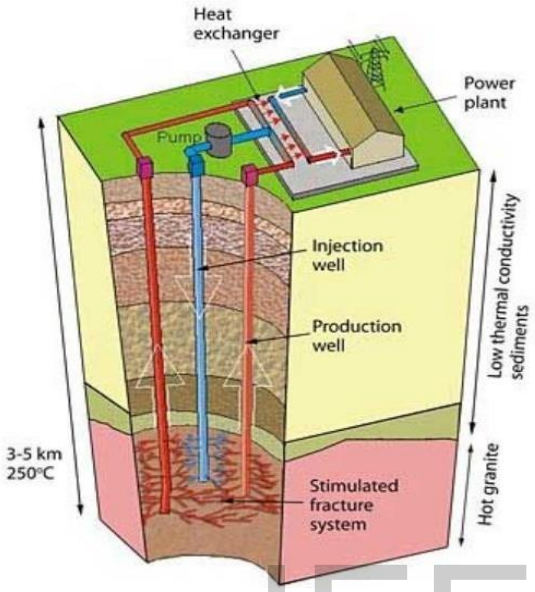

Figure 2 Process of Electricity from Geothermal

Geothermal Energy Applications

Geothermal warmth is the most vicious use of the Saiphon Geothermal (ground-source) heat siphons and restrictions around the world. Considering the single proportion of CO 2 (COP), the biogas obtained from the extended range for warming syphones is used, which considers the vivid inputs (usually electricity) of the three units vigorously in one unit. A geothermal portion is 71% of the measurement limit [i.e. (COP-1) / COP = 0.71]. Cooling burden is not considered as the use of geothermal biology. For this situation, heat is released into the ground or groundwater. The cooling has a job in the substitution for non-renewable energy sources and decrease of ozone harming substance discharges. Space warming the high temp water can be utilized for warming the private structure in the close zones. Diminishing the petroleum derivative devoured in warming houses.

The global warming of nursery warming, the global warming of nursery and progress, is only 15.7% (or 3.0% per year), which is slightly more than the 1995-2000 period. The current limit is 1404 megawatt and annual biography uses 20,661 tej / year. The sum total of 30 countries of Zythamarial Nursery Warming, Georgia, Russia, Turkey, Hungary, China and Italy are the major countries. The use of zooccharic lake and rescue way wetting zoothal life has been reduced once more, as it was considered for years 1995-2000. The drop in 2000-2005 was an annual increase of 6.4% or 1.3%

Geothermal Energy Resources

Geothermal assets incorporate dry steam, boiling water, hot dry shake, magma, and encompassing ground heat. Steam and water assets have been grown financially for power age and surrounding ground warmth is utilized monetarily in geothermal warmth siphons; techniques for tapping different assets are being considered. Research fixates on bringing down costs, improving strategies for finding and describing supplies, and tapping more extensive assets [6],[7]. Geothermal vitality assets: There are four noteworthy sorts of geothermal vitality assets. ¾ Hydrothermal ¾ Geo pressurized saline solutions ¾ hot dry rocks ¾ Magma

The Tectonic Units and Their Geothermal Prospects

A. Sub-Himalayan Fore deep. The Himalayan Fore deep lies south of the Main Boundary Thrust (MBT) up and down the lower regions of the Himalayas. At Salbanhat, at the NW tip of Bangladesh the cellar happens at 2500 m profundity. The temperature at this profundity is 79 oC. The northern slope of Rangpur Saddle is included in the Bangladesh Structure Scheme of Reiman (1986), Himalayan Faridip. The Siouviks Neocene Himalaya is about to be built in Worodep and complete with a thickness of about 3 to 4.5 kilometers, full of grain, lowland and earth and rock beds. Despite that there are inspections units.

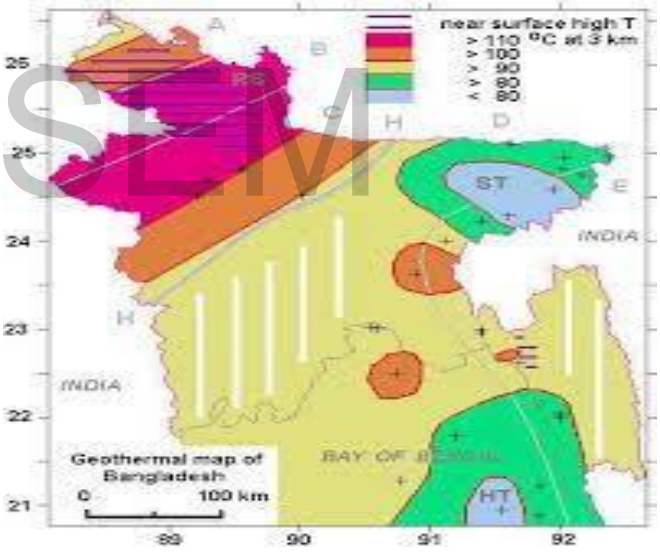

Figure 3 Geothermal Energy Map in Bangladesh

B. Bogra Shelf

The Bogra Shelf (Bogra slant) speaks to the southern incline of the Rangpur Saddle which is a local monocline diving delicately towards south east to the Hinge zone (see Fig.1). This zone denotes the progress between the Rangpur Saddle and the Bengal Foredeep from depositional just as basic perspective. The width of Bogra Shelf changes from 60-125 km. up to the Hinge Zone and the thickness of the sedimentary succession increments towards the southeast Guha et al Stanvac Oil Company (SVOC) completed air attractive and seismic reviews in the mid-fifties pursued by two wells at Kutchma and Bogra. Seismic shapes of the highest point of Eocene Limestone (Bogra Limestone) show provincial plunge of 2-3 degrees other than uncovering various NE-SW slanting deficiencies of which the Bogra issue is the most noticeable. The demeanor of the Sylhet Limestone most

conceivably fits in with the cellar surface. Four profound wells have been bored in the Bogra slant at separations of 22 – 26 km: Singra toward the southwest, Bogra toward the upper east and Kuchma in the middle. The litho-stratigraphic connection between's these wells is appeared in Figure 5.

Geothermal Gradient of Bangladesh

The geothermal angle of Bangladesh is for the most part constrained by the tectono-stratigraphic arrangement of the Bengal bowl. It is, hence, important to assess the geothermal inclination of Bangladesh so as to comprehend individual structural components concerning the local structural history. Geothermal inclinations were determined from redressed bht (base gap temperature) utilizing horner's plot or by basically adding 10°c to the greatest recorded bhts. Surface temperature is thought to be 24°c (75°f) for coastal wells, and 15°c (59°f) for seaward wells. Geothermal slopes were figured on the presumption of a direct increment in temperature with profundity [4].
With this assumption, the temperature of any depth can be expressed by the following equation: Tz=t0+tgz/100
(1)
Tz= the wellbore temperature (°c) at depth z (m). T0=the mean surface temperature (°c). Tg=the geothermal gradient in (°c/km)

Future of Geothermal Energy

Since geothermal vitality is solid and sustainable, this elective power source will begin to appreciate more development. Notwithstanding, simply recollect that geothermal vitality won't really be accessible in numerous zones because of its unstable needs. Regions like California, Iceland, Hawaii and Japan are only a couple of spots where geothermal vitality is being utilized, numerous because of seismic tremors and the underground volcanic movement. From the long haul viewpoint, it is fundamental for Japan to begin examining power age with upgraded geothermal frameworks, which the US and Australia have just begun exploring. At last, there are exclusive standards that geothermal vitality will again come into the spotlight [10], [11], [12].

Positive Attributes of Geothermal Energy

Geothermal power plants have no smoky outflows. Parallel power plants have practically no dirtying emanations [2].

Geothermal power plants utilize next to no land contrasted with regular vitality assets and can impart the land to untamed life or eating groups of steers. They work effectively and securely in touchy living spaces, amidst harvests, and in forested amusement zones [2]

Geothermal wells are fixed with steel packaging solidified to the sides of the well along their length. The packaging secures shallow, cold groundwater aquifers from blending with geothermal supply waters. Along these lines the cold groundwater does not get into the hot geothermal store and the geothermal water does not blend with potential wellsprings of drinking water [2] [6].

Geothermal power plants give truly solid base burden power. A few plants can build generation to supply cresting power. In any case, geothermal plants can't be utilized exclusively as topping plants [2].

Geothermal vitality is "homegrown." This will make occupations, a superior worldwide exchanging position and less dependence on oil creating nations [6].

In enormous plants the expense is 4-8 pennies for each kilowatt hour. This expense is practically focused with ordinary vitality sources [6].

Conclusion

The power crisis of Bangladesh is growing well ordered. It's time that supportable power source began to research in our country. Warm essentialness is one among the head promising practical power sources in Bangladesh. it ought to expect a basic occupation to lessen control crisis of Bangladesh.

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