Geothermal energy potential estimates of the Niger Delta basin from recent studies

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In this work geothermal energy resources map of the Niger Delta Basin was constructed using borehole thermal log data from about 600 deep wells covering. The Niger Delta areas of interest including offshore for the purpose of locating geothermal reservoirs and estimate their potentials in the basin. Three major thermal reservoir anomalies fields were delineated and quantitatively interpreted as presented in form of maps showing the reservoirs potential areas in both onshore and offshore parts of the Niger Delta. The constructed Niger Delta Maps of geothermal energy resources stored in the sedimentary rock mass for the accessible depth interval 0-4000 m shows two major onshore anomalies, one in the north (with maximum energy values, 800 GJ/m^2), another in the east to northeastern part (maximum energy values, 1250 – 1500 GJ/m^2). Another two major anomalies are found located offshore, one in the south with values, 750-1000 GJ/m^2 occurring at about 100 km seawards and the other, in the southwest offshore with values 750-1250 GJ/m^2, still at about 100 km from the shore. A second map of the Niger Delta showing geothermal energy resources stored in the sedimentary rock mass to depth from surface to basement is constructed. In this map, the sedimentary rock thickness is taken to depth of 6.5km. The map shows a small anomaly in the northern part with maximum value 1500 GJ/m^2 and a major anomaly occurring in the eastern part of the basin with values 2000-3500 GJ/m^2 onshore. Offshore in the south and southwest anomalies in the total sedimentary rock mass occur with highest values, up to 4000GJ/m^2 with the southwestern anomaly extending west to the shore. It is much of interest to note the seaward – westward extension of these anomalies both in size, configuration and magnitude for the geothermal energy in the total sedimentary thickness to the underlying basement. These anomalies fields show the most favourable locations and areas of geothermal energy resources for further work.

Biography

Olumide Jepson Adedapo holds a Doctor of Philosophy degree in Geology: geothermic based from Ahmadu Bello University, Zaria Kaduna State, Nigeria. He is the Dean at School of Engineering, Federal Polytechnic and Ado-Ekiti Ekiti State. Nigeria. He has many publications to his credit in learned journals.

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