bore hole expenses connected with a great risk of failure. In case of success the heating energy of the deep ground water can be used for district heating and production of domestic warm water.

2. With 50-200 m deep bore holes, in which we can obtain normal geothermal energy contained in the ground waters and/or in the rocks. The temperatures in these media and depth range in Greece between 15°-20°C and are very suitable to heat and cool buildings and produce domestic warm water by means of heat pumps. In case of a bore hole with a sufficient ground water yield a water pump is needed to feel the heat pump. In case of a bore hole with no ground water exploitable for its heat content, a vertical earth heat excheanger is used. This is a closed water circuit which absorbs the geothermal energy from the first tens or hundrends of meters of the rock strata and feeds the heat (geothermal) pump.

The earth coupled heat pump systems of type 2 are very suitable for the climatic and shallow goethermal conditions of Greece and can be used for indivudual dwellings and buildings of any kind. Their high unitial installation costs are compensated by their low functional and maintenance costs. But the additional profits of these systems are:
— the energy saving, as their Coefficient of Performance (COP - ratio of produced heat energy to consumed electrical energy) is expected to be greater than 3:1 in Greece.
— the use of a renewable energy source, which is environmentally pure and everywhere - everything steadily flowing and therefore available also in regions requiring urgently substitutes for the pollutant mineral fuels.

The systems of type 2 are also very interesting from the point of view of energy saving and environmental suitability. A research for the application of these systems, as well as of those of type 1 in Attica is in progress.

PROBABILITIES OF OCCURRENCE OF LARGE EARTHQUAKES IN VERY ACTIVE ZONES OF THE EARTH

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Analysis of the seismicity in 24 active zones of the world is attempted in terms of repeat times of strong earthquakes. A recently compiled homogeneous catalogue of large earthquakes ($M_s \geq 7.0$), which covers the time span 1898-1985, was used in this analysis. A probabilistic approach is used to forecast the likelihood of large future shallow earthquakes in certain seismic zones of the world. The time dependent seismicity model and the Poisson one were used and the probability that a seismic zone

will be the site of a large shallow earthquake during the time period 1986-2006 was calculated for various magnitude levels. Based on the assumption that the time dependent seismicity model has a more physical meaning than the memoryless seismicity models, a map was compiled depicting the probability that a seismic zone will be experienced earthquake with $M_s \geq 8.0$ in the given time period. As an evidence, of the above considerations, we constructed a map which presents the occurrence of earthquakes with $M_s \geq 7.5$ in the world's seismic zones starting at 1986. It can be seen that a strong earthquake with M_s=8.1 occurred in 1986 within zone 19 (Kermadec and Tonga Islands), while earthquakes with $M_s \geq 7.5$ occurred in some parts of the circum-Pacific (Alaska and Aleutian islands, Taiwan, Philippines islands, New Britain and Solomon islands, Costa-Rica) which is the most seismogenic region of the world. An earthquake of the same magnitude intervals was also occurred in Iran, which belongs to the Eurasian seismic belt. It was also observe that all seismic regions of the world have at least once experienced, during the present century, and earthquake with $M \geq 8.0$.

RECENT ACTIVITY ON EARTHQUAKE PREDICTION RESEARCH CARRIED OUT BY THE SEISMOLOGICAL INSTITUTE

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The Seismological Institute of the National Observatory of Athens is the responsible center in Greece to carry out continuously the routine seismic observations. Recently the Institute completed the installation of a modern, real time, telemetric network which results in a better detectability of earthquakes and in a more accurate determination of their parameters.

The material collected gave the opportunity to perform earthquake prediction research by examining seismicity patterns in a systematic way with the help of some modern techniques.

The v-value method is used to discover temporal changes in the present seismicity level as well as the technique proposed by Matsu'ura to investigate anomalous seismicity changes before the occurrence of the large aftershocks.

These methods seem to be promising and the obtained results are quite encouraging in areas where dense seismological network is established and the seismological data are observed in real time.

Attention has been also given to eartquake prediction which is characterized as intermediate-term. For this research the M8 algorithm is the most common and examins several seismicity patterns in order to define the Time of Increased Probability (TIP).