CONCLUDING REMARKS TO THE SEVENTH ASIAN GEOTHERMAL SYMPOSIUM

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ABSTRACT

On behalf of the National Advanced Institute of Industrial Science and Technology (AIST), Japan, this paper gives concluding remarks to the Seventh Asian Geothermal Symposium and acknowledgements to all the supporting organizations and participants. Whether preferable or not, we Asian countries inevitably share the same global environmental issue and the same energy security problem in the current borderless world. Attention is here drawn to two urgent aspects in relation to the necessity of geothermal developments. One is that the global warming is already advancing as serious expressions such as unusual climate, desertification and sea level rise. The other is that a serious threat of the final oil crisis is closing within the earlier half of the 21-century. These trends inevitably accelerate geothermal development all over Asia. Efforts like the Seventh Asian Geothermal Symposium could be believed foresight to the future Asia.

Keywords: address, the Seventh Asian Geothermal Symposium, Asia, global warming, final oil crisis, geothermal development

1. INTRODUCTION

Asian Geothermal Symposium has been almost annually held since 1998 and aims at assembling the Asian geothermal fellows as many as possible.

Because East and Southeast Asia is one of the most dynamic spots on the economical growth in the world, energy demands are rapidly increasing. However, most of East- and Southeast-Asian countries are importing great amounts of petroleum from oversea areas, excepting a few countries. The more economy will grow, the more a risk of the energy security will increase. In addition, consumption of fossil fuels will face the global environmental issue by the carbon dioxide emission. We also share the borderless environment in the Asian region on the earth.

Geothermal energy resources are domestically available and mitigative to the carbon dioxide emission. They are satisfactory from both points of the energy security and global environmental issue. Geothermal energy resources are abundant in Asia (Fig. 1) and one of the most prospective natural energy resources expanding to the future in Asia, as has been proven by 20 % of electricity supply in the Philippines and 4 % of electricity supply in Indonesia. The Asian Geothermal Symposium was initiated for these demands to spread geothermal utility over Asia.

The author has already described such an issue in detail (Noda, 2003). This paper enhances current two topics on the serious progress of the global warming and a serious threat of the final oil crisis. Then, this paper proposes declaration, asking agreements from all the participants.

2. ACKNOWLEDGEMENTS

On behalf of the Institute for Geo-Resources and Environment (GREEN), the National Institute of Advanced Industrial Science and Technology (AIST), a main sponsor of the Seventh Asian Geothermal Symposium, the author would like to express his sincere greeting to all the distinguished guests. It is our great honor to obtain an attendance of Mr. Qingfa Tao, Deputy Director, Dept. of Geological Environment, Ministry of Land and Resources of China. The author expresses his sincere acknowledgement to Mr. Qingfa Tao. Our special gratitude would be expressed to the Geothermal China Energy Society (GCES), China, for the cooperative sponsorship, hearty hospitality and great preparation efforts as a host organization that enable us to hold this Symposium in China. Particularly, this Symposium is owing to the great efforts devoted by Prof. Keyan Zheng, GCES. The author would like to extend his great appreciation to the Korea Institute of Geoscience and Mineral Resources (KIGAM), Korea, for the cooperative sponsorship as well as dispatching three lecturers by KIGAM's own budgets. The author would also like to thank the Geothermal Research Society of Japan (GRSJ) and the International Geothermal Association (IGA) for their supports to this Symposium.

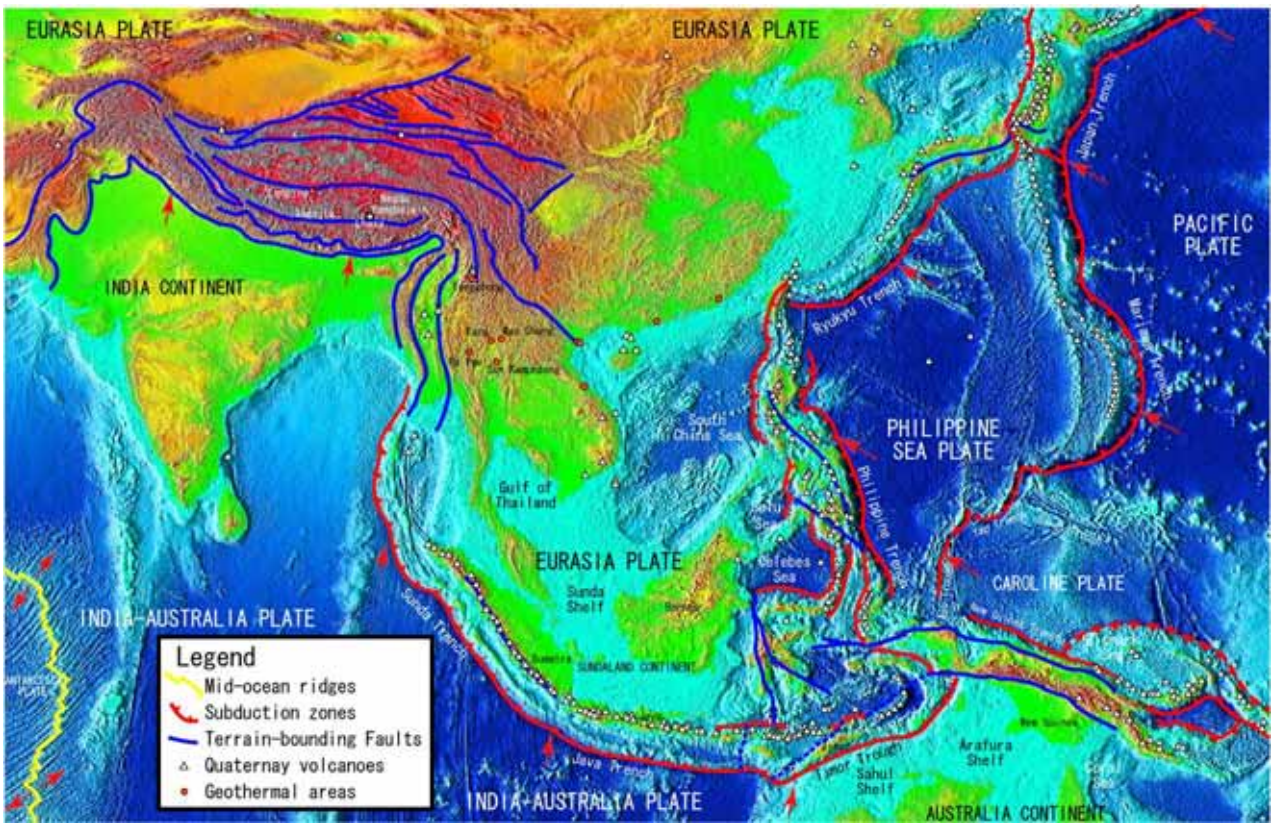

Fig. 1 Map of tectonic and geothermal settings of the East and Southeast Asian region on the ETOPO2 of NGDC, NOAA (Muraoka, 2003).

Our special thanks are also placed to the Mitsubishi Material Natural Resources Development Corporation (MRC) for their great efforts to prepare this Symposium as a secretariat. Particularly, the author thanks Mr. Takehiro Koseki for his great contributions.

On behalf of AIST, GCES and KIGAM, the author expresses his hearty appreciation to an invited special lecturer, Mr. Brian Roy White, Executive Officer, New Zealand Geothermal Association. His input makes the Symposium brilliant and very useful.

The author expresses his cordial gratitude to invited lecturers, Dr. Sjafra Dwipa from Indonesia, Ms. Christine H. Siega from the Philippines, Dr. Nguyen Hong Bang from Vietnam and Mr. Jigjidsuren Batbaatar from Mongolia. Their inputs are essential to this Symposium. The author also expresses his cordial gratitude to lectures, Dr. Yoonho Song, Dr. Hyoung Chan Kim and Dr. Tae Jong Lee from KIGAM, South Korea. They kindly cooperate with AIST and GCES to compose this Symposium.

Finally, the author would like to extend his special appreciation to lecturers as well as audiences from China. In spite of the limited budget of AIST, this Symposium becomes the largest event among the last seven times Asian Geothermal Symposia. This is solely owing to the enthusiastic cooperations and contributions by Chinese participants.

3. BRIEF HISTORY OF ASIAN GEOHERMAL SYMPOSIUM

The Asian Geothermal Symposium has been annually held since 1998, aiming at information exchange on geothermal resource developments in Asia and promoting international cooperation. Table 1 shows brief history of the Asian Geothermal Symposium. Among the past six symposia, the earlier three had been held as a side meeting of the Annual Session of the Coordinating Committee for Geoscience Programmes in East and Southeast Asia (CCOP), held at Subic in the Philippines, Hanoi in Vietnam and Bangkok in Thailand, respectively. The later three have been held at Bandung in Indonesia, Kuala Lumpur in Malaysia and Daejeon in Korea, separated from CCOP meeting.

Table 1 Brief history of the Asian Geothermal Symposium.

Name of symposium	Year	Period	Country	City	Theme	Sponsor
1st Asian Geothermal Symposium	1998	October 28	Philippines	Subic	Current and Future Geothermal Energy Development in Asia	NEDO
2nd Asian Geothermal Symposium	1999	October 22	Vietnam	Hanoi	Difficulties in Geothermal Development and Their Solutions	NEDO
3rd Asian Geothermal Symposium	2000	October 25-26	Thailand	Bangkok	Geothermal Direct Use	NEDO
4th Asian Geothermal Symposium	2002	February 25-26	Indonesia	Bandung	Strategy of Asian Geothermal Development in the 21st Century	NEDO
5th Asian Geothermal Symposium	2003	March 25-26	Malaysia	Kuala Lumpur	Exploration and Exploitation of Geothermal Resources as Dispersive-type Energy	GREEN
6th Asian Geothermal Symposium	2004	October 26-27	Korea	Daejeon	Mutual Challenges in High- and Low-Temperature Geothermal Resource Fields	GREEN and KIGAM
7th Asian Geothermal Symposium	2006	July 25-26	China	Qingdao	Giving Strong Roles to Geothermal in Renewable Energy Growth	GREEN, GCES and KIGAM

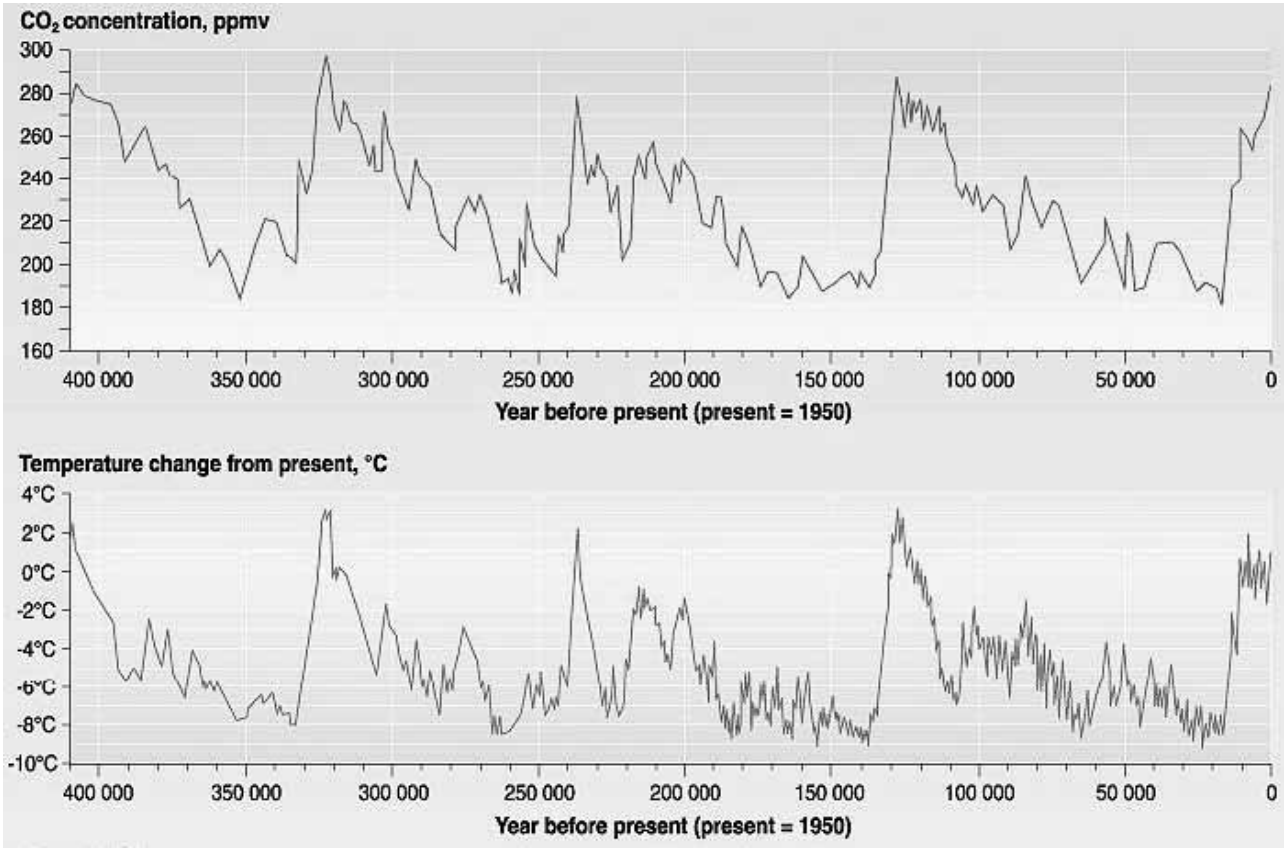

Fig. 2 Change in carbon dioxide concentration and temperature of atmosphere during the past 400,000 years by Petit at al. (1999) from the Vostok ice core in Antarctica.

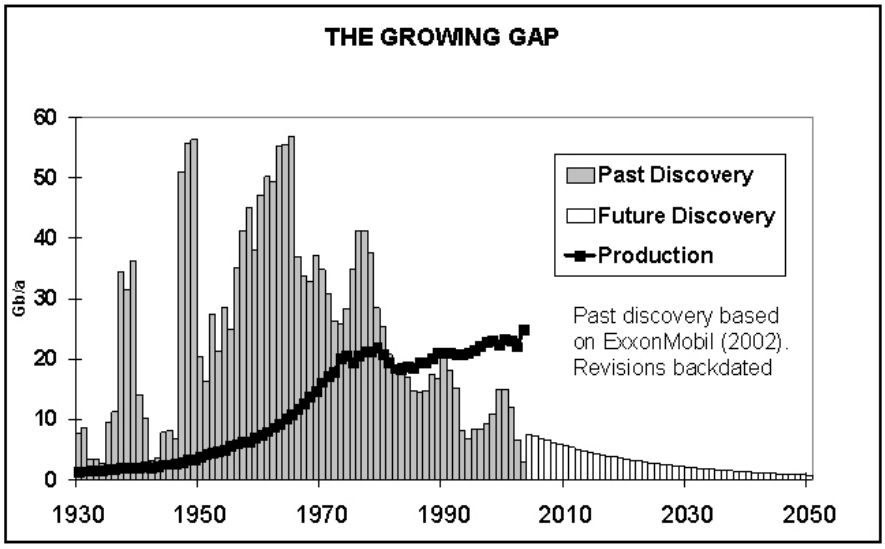

Fig. 3 A growing gap of discovery and production of regular oil and natural gas liquids until 2004 (ASPO, 2004).

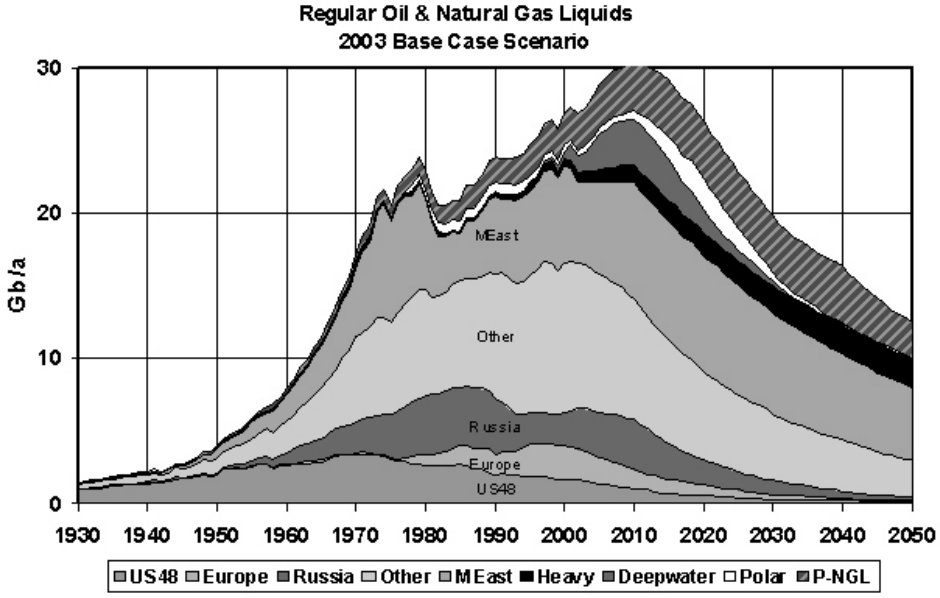

Fig. 4 A future scenario of regular oil and natural gas liquids (ASPO, 2004).

The earlier four symposia were sponsored by the New Energy and Industrial Technology Development Organization (NEDO), while the Fifth and Sixth Asian Geothermal Symposia were sponsored by the Institute for Geo-Resources and Environment (GREEN), AIST, in cooperation with other organizations. The Seventh Asian Geothermal Symposium was planned to hold in Qingdao, China, as geothermal drilling is dramatically increasing in China since the year 2000 (Zheng, 2004) and a geothermal research and development base is constructing in Jinan, Shandong Province.

4. A THREAT OF THE GLOBAL WARMING

According to an estimate on the chronological change of the atmospheric carbon dioxide concentration and atmospheric temperature during the past 400,000 years (Fig. 2; Petit et al., 1999), when the atmospheric carbon dioxide concentration accelerated the global warming, a natural switch worked to have lowered the atmospheric carbon dioxide concentration in turn, probably by the mechanism of widespread growth of forests and coral reefs. The four times global warming during the inter-glacial epochs were always recovered by this natural switch. However, the upper threshold of the atmospheric carbon dioxide concentration was only as high as 300 ppm in those days. Nowadays, the atmospheric carbon dioxide concentration is closing to 400 ppm by the human activity and it is far beyond the threshold for the natural switch. We are entering an irreversible process in terms of the natural switch.

We are not sure about the death scenario of human being by the global warming. One scenario may be the sea level

rise that is now attacking atoll nations "Maldives" and "Tuvalu" where an average elevation of the territory is less than 2 m above sea level. Another scenario may be the widespread desertification that is also serious in western and middle China, as seen in the drying up of the Yellow River (Huanghe) since 1970s. The most serious scenario may be the daily storms by the accelerated atmospheric circulation. Numbers, sizes and hazards of Typhoons and Hurricanes seem larger and larger.

5. A THREAT OF THE FINAL OIL CRISIS IN THE EARLIER HALF OF THE 21-CENTURY

Discovery of oil and gas reservoirs has already been decreasing since 1966 (Fig. 2, ASPO, 2004). Production of oil and gas is usually following the discovery with 30 or 40 years delay time (Fig. 2, ASPO, 2004). For example, the peak of discovery in 1950 was traced by the peak of production in 1980 with 30 years delay time. The production peak tends to have recently been lasting longer than before, because of the oil storage or other efforts. However, it seems evident that the final peak of discovery in 1966 will soon be traced at around 2010, at least, within the earlier half of this century. It must be the final oil crisis.

Recent sudden rises of crude oil prices are often ascribed to the unstable policy situation in Middle East Asia, but there is another possibility that could be the sign for the coming final oil crisis. Therefore, various efforts for development of the oil-alternative energy resources are recommended not only in Asia but also in the world.

6. DECLARATION OF THE SIXTH ASIAN GEOTHERMAL SYMPOSIUM

The author would like to remind you of the Declaration of the Asian Geothermal Symposium that has been adopted since the Fourth Symposium.

1. Participants in this Symposium shall be "fellows" to disseminate the priority of clean geothermal energy to citizens, governments and world hereinafter.

2. Participants in this Symposium shall assist the fellows in promoting the dissemination purpose to each other.

3. Participants in this Symposium shall try to enlarge the fellows' circle.

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