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Hydrothermal Energy Application Technology Using Dam Deep Water

Authors : Yooseo Pang, Jongwoong Choi, Yong Cho, Yongchae Jeong

Abstract : Climate crisis, such as environmental problems related to energy supply, is getting emerged issues, so the use of renewable energy is essentially required to solve these problems, which are mainly managed by the Paris Agreement, the international treaty on climate change. The government of the Republic of Korea announced that the key long-term goal for a low-carbon strategy is “Carbon neutrality by 2050”. It is focused on the role of the internet data centers (IDC) in which large amounts of data, such as artificial intelligence (AI) and big data as an impact of the 4th industrial revolution, are managed. The demand for the cooling system market for IDC was about 9 billion US dollars in 2020, and 15.6% growth a year is expected in Korea. It is important to control the temperature in IDC with an efficient air conditioning system, so hydrothermal energy is one of the best options for saving energy in the cooling system. In order to save energy and optimize the operating conditions, it has been considered to apply ‘the dam deep water air conditioning system. Deep water at a specific level from the dam can supply constant water temperature year-round. It will be tested & analyzed the amount of energy saving with a pilot plant that has 100RT cooling capacity. Also, a target of this project is 1.2 PUE (Power Usage Effectiveness) which is the key parameter to check the efficiency of the cooling system.

Keywords : hydrothermal energy, HVAC, internet data center, free-cooling
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