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## Study on the output control method of CO<sub>2</sub> hydrate engine generator

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The utilization of alternative energy is being strongly promoted in order to prevent the progression of climate change due to the increase in greenhouse gas emissions. Therefore, in our previous study, the carbon dioxide (CO<sub>2</sub>) hydrate engine generator (CHEG), which converts unutilized energy to electrical energy, has been proposed as a way to produce alternative energy. CHEG uses the heat cycle of a CO<sub>2</sub> hydrate which is generated by a small temperature difference using heat from such unutilized energy sources as low-temperature exhaust heat from home heating appliances, difference in temperature between day and night, geothermal heat, etc. In previous studies, the theoretical validity of the CHEG as an alternative energy for homes has been analyzed, but the control method of the power output for responding to changes in the power load has not been investigated. In this paper, the dynamic model of the CHEG is constructed to investigate the dynamic characteristics of the control method of power output. This model uses a basic control method that controls the mass flow rate of heat medium in order to change the heat flux which flows to a CO<sub>2</sub> hydrate reactor from an outer heat exchanger. Results of the numerical simulation using the above model showed that the proposed method can control the output power at a constant value in the range of 40-100% of the rated value.

### Biography

Masahito Kawai received Master of Systems Information Science from Future University Hakodate, Japan, in 2006. He is now a Doctor Course Student at Kitami Institute of Technology. His research interest includes renewable energy.

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