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[\[PDF \(627K\)\]](#) [\[References\]](#) [\[Supplementary Materials\]](#)**Potential maximum hydroelectric energy development in Japan**[Shinya Mitsuishi](#)¹⁾, [Masaaki Okamoto](#)²⁾, [Hiroshi Takahashi](#)²⁾ and [Hisashi Imai](#)²⁾

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(Received: December 15, 2008)
(Accepted for publication: March 6, 2009)**Abstract:**

The recent population increase and economic development have increased the energy demand in many countries. As global fossil fuel reserves are limited, it is highly likely that the supply of fossil fuels will come under increased pressure and the development of alternative energies throughout the world will become essential. Assuming a Japanese population of 64 million in 2100 with a 20% increase of the power demand per capita from the present level, we studied the electric power supply and demand situation in 2100 by conducting the trial calculation of the maximum development potential of hydroelectric energy, a renewable energy produced in Japan. The findings indicate that the hydroelectric generation capacity can reach approximately 190 billion kWh/year, which is 1.97 times that of 2005 levels. This would be achieved by raising the height of existing dams and flexibly operating dams for power generation in harmony with the flood control and water supply for agricultural and other usage. Presupposing the completion as planned of the nuclear power plants currently under construction and a fivefold increase of the total output of wind power and other alternative power generation sources, it is concluded that a stable power supply will be possible in 2100 without dependence on fossil fuels.

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