

Research Title: The use of hot springs as a means of Binary Power Generation

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As a consequence of the Fukushima nuclear disaster 9 years ago, Japan heavily relies on fossil fuels for energy generation. To reduce further emissions, Japan requires a wider variety of renewable energy sources. Upon realizing Japan's potential for geothermal energy output, we decided to focus on the use of hot springs as a means of Binary Power Generation.

Hot springs, locally known as *onsen*, are an integral part of Japanese culture and can be found all over the nation. In the process of cooling hot water to optimal temperatures for *onsen*, a lot of potential heat energy is put to waste. By implementing Binary Power Generation, wasted heat energy can be used to produce electricity. However, this form of energy production remains experimental and underutilized within Japan.

In this study, we will analyze currently active plants and the challenges they faced, such as construction and maintenance costs as well as gaining trust from the local community. Then, we will propose ways to solve problems that come up in the process of implementing Binary Power Generation plants.

Once Binary Power Generation is used on a larger scale, Japan's energy will be more self-sustaining, paving the way to a cleaner, brighter future.