Deep geothermal ambitions in Norway

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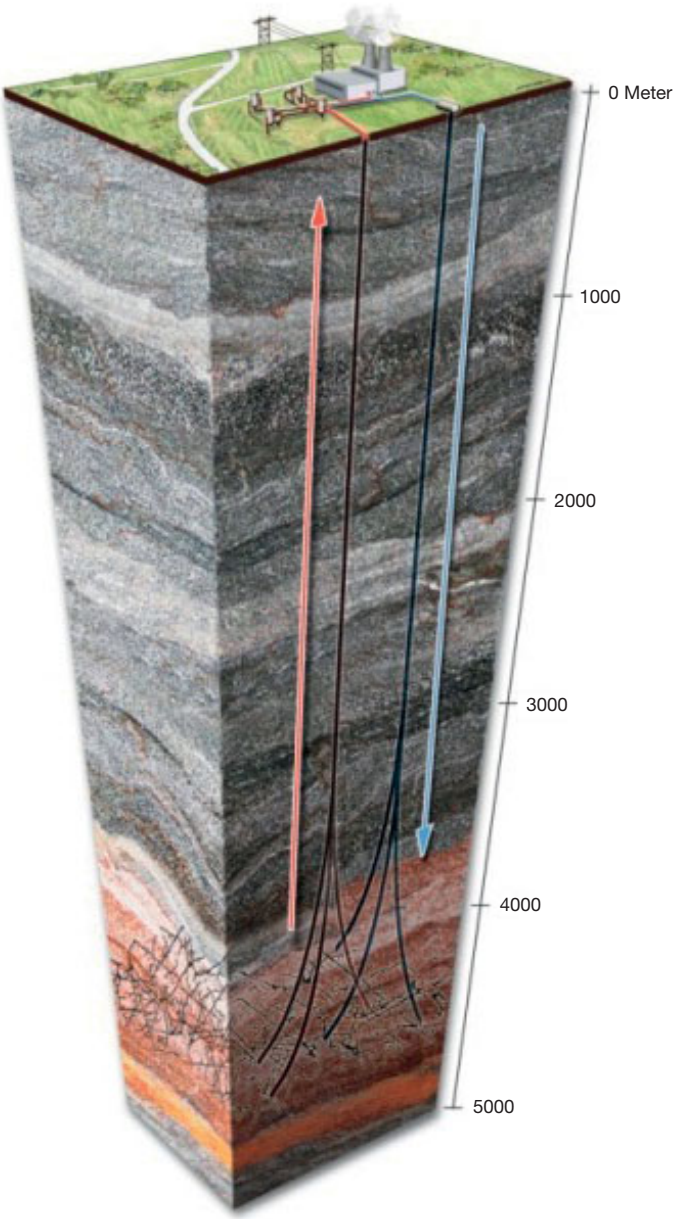
For deep geothermal plants to make significant contributions to the renewable energy mix, the plant sites cannot be limited to places where there are pre-existing fracture networks several kilometers below the surface able to act as reservoirs of hot fluid. Enhanced geothermal systems address this challenge by pumping water into the hot rock through injection wells to create a fracture network, a process called hydraulic fracturing. The figure illustrates how energy is subsequently extracted and converted to electricity while recycling the water.



In an enhanced geothermal system, cold water pumped through an injection well (blue) passes through the created fracture network, where it is heated by the surrounding rock, and returns to the surface through a production well (red). At the power plant, electricity produced by heat exchangers and turbines enters the grid, while the water is re-injected into the reservoir. Figure courtesy of K. Midttømme, CGER.