

Transverse Faults in Alberta and their importance for Geothermal Energy development

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In recent years the use of geothermal energy for both electricity and heating has been growing rapidly through the implementation of low temperature geothermal production systems in Europe and the United States. Geothermal energy is unobtrusive and emission free, available 24/7 and operational costs are low and stable. The use of the Earth's heat is therefore increasingly considered in future renewable energy strategies in these countries and it seems logical that Canada will follow their lead.

Engineered Geothermal Systems (EGS) for deep wells is a promising development in converting heat into electricity. The production of hot water is similar to the production of petroleum and therefore, horizontal drilling and fracking will play an important role. These applications ask for extensive knowledge in temperature and pressure modeling, geomechanics and structural geology. Folds, faults and fractures will define exploration plays and will be more important than ever in a world which is subject to changing supply of energy in our society.

This paper will discuss the various faults and fractures of the Alberta Rockies. Transverse faults of the Crowsnest Pass, Banff, Nordegg, Jasper and Grande Cache areas will be discussed. It will be shown that there are many more transverse faults present than represented on most published geological maps. Off sets along those faults range from kilometers to a few meters. Relationships with fracture fabrics will also be discussed.