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Tiivistelmä-Referat-Abstract Hydropower is one of the most important sources of electricity in Finland and in the Nordic countries. It is studied in this work how the water resources are allocated under perfect competition and in a monopoly. The question is considered from the viewpoints of a planner and a producer. A number of alternative models to model and plan the use of water resources are presented. The first chapters present shortly how the electricity is generated and consumed in Finland and in the Nordic countries. Furthermore it is given an overview on the transmission and distribution systems of electricity. The reader gets also an idea how a hydro power plant is operated. In the following chapters the planner's solution is presented and how the water resources get allocated under perfect competition and in monopoly. The planner's solution is studied with the help of two models. The first model is a simple two-period model and the second model a costs minimizing model. The solution under perfect competition is first analyzed with a two-period model and then with a more realistic multi-period model. In the chapter of monopoly the behaviour of private and public monopolies are analyzed with the help of two-period model. At the end a novel model is presented. With this model the opportunities to abuse market power are eliminated. Also the problems and justifications of wind fall taxation are considered from a juridical and an economic viewpoint. The following aspects of the different market structures are considered: price formation, market power, efficiency and welfare distribution. The theoretical results are compared with studies and analysis about the Nordic power markets.			
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