

Preface

The main purpose of this book is to present research on a kind of water use conflicts that probably will become more and more common and important as time goes by. In times of increasing demands for electricity as well as environmental services the question arises how to best managing moving water. Should more be diverted to or from electricity generation? That is the kind of timely question which this book addresses. We develop a simple general equilibrium model of a small open economy which is used to derive a cost-benefit rule that can be used to assess projects that divert water from electricity generation to recreational and other uses (or vice versa). The cost-benefit rule is used to evaluate a proposed change at a Swedish hydropower plant. According to the proposal, water is diverted from electricity generation to the natural river channel (dryway) creating environmental and recreational benefits.

We present a framework for assessing the costs and benefits of small perturbations of current hydropower regulatory regimes. The framework integrates several key issues, including, but not limited to: a contract between the hydro power plant and another party (local residents) generating the general equilibrium cost-benefit rule; the contract is a corner stone of our referendum-style contingent valuation study; the tax system in the status quo; (partial) foreign ownership of the plant; trade in electricity; trade in renewable energy certificates; trade in carbon emission permits; externalities of replacement power (generated in other countries); value of loss of regulating (balancing power) and other system services; transmission of electricity modeled as provided by natural monopolies; downstream hydrological externalities and environmental benefits (aesthetic, recreational and otherwise). We also present a contingent valuation study where local residents participate in a hypothetical referendum about the proposal. The web-based questionnaire has some novel features with respect to the format of the valuation questions, introducing an open-ended willingness to pay question plus an interval question within a hypothetical local referendum. We also put some numbers on the different items of the cost-benefit rule in order to illustrate possible magnitudes of different benefits and costs. A quite extensive sensitivity analysis is provided introducing new tools that we believe will be useful in future cost-benefit analysis.

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Hydroelectricity Versus Other Uses

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