

Preface

This Master's Thesis was prepared during the spring of 2006 at the Norwegian University of Science and Technology (NTNU), Department of Industrial Economics and Technology Management. Our work falls within the Group of Investment and Finance Management. This thesis was accomplished in cooperation with Statoil ASA.

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Executive summary

In this thesis we investigate the profitability of a CO₂ supply chain, which is assumed to consist of CO₂ sources, transportation infrastructure and CO₂ sinks. We introduce natural gas power plants with CO₂ capture, located on the Norwegian west coast, as CO₂ sources. Oilfields on the Norwegian Continental Shelf are introduced as CO₂ sinks, and we investigate the profitability of injecting CO₂ into oil reservoirs in order to enhance oil recovery. The main focus is aimed towards the overall profitability of a CO₂ supply chain, and in this context we assess the profitability of 11 different CO₂ supply chains. The profitability of the proposed CO₂ supply chains is estimated by using stochastic commodity price models, and by implementing a stochastic model for the amount of incremental oil that can be recovered through CO₂ injection for each oilfield. In this way we are able to provide profitability estimates, as well as to evaluate the uncertainty associated with the supply chain profitability. In addition to introducing stochastic models, we also perform sensitivity analyses on the main profitability drivers and analyse the profitability of a CO₂ supply chain by using scenario analysis with fixed commodity prices.