

Energy Economics

Interactions between oil and gas production in Norway

To what degree are there interactions between profitability of oil and gas production on the Norwegian continental shelf? Is it so that profitability of gas production depends significantly on whether oil resources are also extracted? Or is it possible to reduce Norwegian oil production, if desired, without significantly reducing the profitability of Norwegian gas production?

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Energy use in energy-intensive industry

What factors drive electricity and other energy consumption in energy-intensive industries in Norway? To what degree is this consumption affected by energy prices? Is energy consumption more price responsive in the long term than in the short term? These questions are important in analysis of the electricity market, where energy-intensive industries constitute a large share of the market, and in analysis of greenhouse gas emissions.

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Nuclear power adaptation to energy prices

Background: It appears that nuclear power plants in various countries have a slightly different way of adaptation. The aim of the thesis is to establish what are the microeconomic basis for adaptation and any technical constraints. What are the marginal costs in different time frame (hour, day, week)?

Analysis of wind power measurements and preparation of model to simulate the interaction between future wind power production and inflows in hydropower system.

Effectiveness of different instruments to promote renewable energy generation.

Different countries have adopted different measures to promote renewable energy generation. The thesis should provide an overview of the models that are used in various European countries and discuss the incentive properties and the extent to which they promote economic efficiency.

Economic efficiency gained from harmonization of policies (framework) for renewable energy production in the Nordic countries.

The EU Water Framework Directive may impose restrictions on the regulation of the production of hydroelectric power plants in many rivers in the region in the Nordic countries. The thesis shall assess the implications of these restrictions on price formation and flexibility of hydropower system. Here it is applicable to use simulation models of the market with different assumptions about how hydropower production is affected.

Analysis of the interaction between the markets for CO2 quotas and green certificates.

Simulation model and discussion of how a Norwegian gas power station will affect CO2 emissions in the Nordic countries/ Europe in the short and medium term. The analysis should test different assumptions about price elasticity and other essential factors.

Localization signals to promote optimal location of new power generation in the international energy market (Existing measures and discussion of problems).

What role will cogeneration (CHP) play in Europe in relation to the EU's directive on renewable energy production?

Economic analysis of the development of district heating. It is necessary to consider specific projects, including the macroeconomic assessments and comparisons of Nordic countries / evaluation of costs.

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Price Variation

Prices in a hydropower system should be the same throughout the day. Some of the reasons for why they vary so much is because we are a part of a thermal system. Another important reason for that may be the production from the river power plant. The analysis is to set up a data set based on inflow series from NVE (days) for 63 regions. The thesis can be in the direction of: Evaluation of the percentage of the river power in the various regions, and estimating a correlation with the prices in the regions and looking if there is a correlation with the transfer restrictions.

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Wind Power

What are the externalities associated with wind power? One can for example check changes in property prices before and after or at the same types of areas with or without wind turbines in Denmark or California, or France, or England. Tie this to the property values in the current Norwegian development area and calculate costs. A survey of valuations of wind power could be part of the thesis. It requires efforts to determine whether the recorded data is feasible without data collection.

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Biofuel from former pasture

Several reports show that Norway is growing again, there are also several series of images from the past 100 years showing the same. The main reason for this is the restructuring of operations in agriculture, grazing animals for the most part are gone. In many locations in Norway tourism industry gets complaints that views and landscape disappears and management of cultural landscapes has emerged as an important part of a multifunctional agriculture. In the former pastures the deciduous forests of small industrial value come up and it is from several quarters been raised question if these areas could be used as a biofuel while at the same time delivering a more desired landscape. Skogforsk has a project underway where one studies the management of such areas and different logistics solutions that can be applied. A possible thesis would be to study the cost-efficient solutions to extract biofuel from such areas.

Another approach is to focus on agricultural policy and environmental economic aspects. How much is an open cultural landscape worth to society? How much is it reasonable that the community provides the support for this? How much support is needed for biofuel utilization to be profitable? How can the policy in this area be accommodated with the new WTO regime? The thesis could be linked to a strategic institute program at the Skogforsk, this program began in the spring of 2006.

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Economic analysis of the introduction of bioenergy in the dairy sector

Several approaches to the thesis are possible, assessment of specific projects, studies of policy measures, comparison with the situation in Sweden.

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Security of supply of electricity - Online Survey

The security of the supply of electricity is crucial in the Government's energy policy. The power crisis in Central Norway and the need to import 5-10% of our annual electricity consumption nationally clearly shows the vulnerability of our electricity supply. Increasing frequency of extreme weather events has also shown how vulnerable our old power grid is, and there is a great need for improvement of our transmission lines. While commercially beneficial effects of increased supply in the form of lower frequency of power outages is relatively easy to document, the benefits to the population from the greater security of supply of electricity has been studied very little (both in Norway and elsewhere in Europe). There is therefore a need for WTP surveys among Norwegian households in the form of Contingent Valuation and / or Options Experiments to document how much households' welfare increase as a part of the economic benefit of lower frequency of power outages. Such an investigation can be conducted as an internet survey. Electricity Industry Association (EBL) could provide guidance and coverage of actual costs.

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Environmental costs of renewable electricity production

Large investments in new renewable energy sources in Norway have negative environmental effects, and may thus be economically less profitable than one would think at first glance. Wind power and micro / mini / small hydropower entails landscape aesthetical intervention. It is therefore important to document the environmental cost of these renewable energy sources (in addition to investment and operating costs) in order to compare the full social cost of these energy sources with hydro, gas and imported coal. This can be done by transferring values from other studies (for example by doing meta-analysis of previous Norwegian and foreign Stated Preference Surveys (Contingent Valuation and Choice Experiments) and Property Price Study (hedonic Price-study), and by implementing such new valuation studies in Norway, focusing on different energy sources and also different needs for power lines, which also cause serious environmental costs due to landscape aesthetic effects and various health effects of electromagnetic fields.

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Transmission costs, local variation and efficiency analysis

Tariff in the distribution of electricity is partly determined through an analysis and comparison of the technical and economic efficiency of the network companies. In addition, the tariff shall take into account local variations in weather, topography, habitation and other infrastructure. In this context it is relevant to analyze the consequences of variations in weather and topography on the cost level. It is necessary to use both DEA and SFA methodology here.

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New grid tariff and investment analysis

NVE has introduced a new system of setting up a tariff in the distribution of electricity. It is necessary to analyze how the investment is influenced by the new tariff system and how investment affects future tariff.

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Pricing models for Nordic energy market in the short term (day ahead to four weeks)

Point Carbon (and many others) are trying every day to predict electricity prices in the short and long term. We believe that there is a potential to improve these forecasts with better models - especially the short-term forecasts. Thesis can also be turned towards analyzing price fluctuations through the day. Data can be found in our databases.

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Welfare Gains from market coupling

More and more national and regional energy markets connect through the so-called market coupling. What is market coupling? What types of market coupling exist? In November 2006, the markets in the Netherlands, Belgium and France coupled. What was the welfare gain from this coupling? Alternatively, one can analyze NorNed and Blackpool North – APX market coupling.

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Regulations costs with the presence of much wind power

Wind power is completely unregulated. When the wind blows, one must produce. To balance between demand and production, other production technologies need to be regulated. These are priced through regulating energy market. What is the cost of this regulation in Denmark? What is the value of Denmark by Norwegian regulatory capacity (hydro)?

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