

# **Title: Economic Forest Management with Consideration of the Forest and Energy Industries**

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## ***Abstract***

The joint supply chain of the forest and energy industries in Sweden is defined as a full system multi period optimization model with forest production and the forest- and energy industries. The complete chain is optimized in order to maximize the total expected present value over a 50 year planning horizon, divided into ten five year periods. A multi period quadratic programming model solves the complete problem with a finite number of iterations. The multi dimensional state space is continuous. Complete and consistent solutions are obtained in seconds. These properties of the model make it useful as a tool during continuous discussions with decision makers. The dynamically optimal coordinated decisions are determined. These include:

- harvests of timber, pulpwood and energy assortments such as tops and branches
- distribution of the harvested raw material between different industries,
- distribution of intermediate products such as saw dust, chips and black liquor between the different industries,
- production and capacity investments in the different industries

For the Swedish case, it is found that it is feasible and economically rational to significantly increase both the bioenergy production and the forest industry production. The future use of fossil fuels will be strongly reduced and the employment level improves. The optimization model can be adapted also to other countries and regions in the world.

## ***Biography***

Peter Lohmander became master of science in forestry, with master thesis in mathematical statistics, 1981, doctor of forestry in forest economics, SLU, 1987, and acting professor, forest economics, SLU, 1990. He was declared as competent, and as the most competent of three competent applicants, for professorship (by all the three referees) in forest economics, SLU, 1990. He became associate professor of forest economics, SLU, 1995 and was declared competent for professorship (by all the three referees) in forest planning, forest management, SLU, 1995. Peter Lohmander was appointed professor of forest management and economic optimization, SLU, faculty of forest sciences, 2000. Furthermore, he was declared competent (by all the three referees) for professorship in industrial economics, SLU, 2009. Peter Lohmander is the leader of a project funded by the energy company E.ON, with a reference group from two other companies: Korsnäs and Sveaskog. Sveaskog is the largest forest owner in Sweden and Korsnäs is one of the larger forest industry companies. The title of the project is "Economic forest management with consideration of the forest products and energy industries." Lohmander is presently also developing the global project: "*Rational and sustainable international policy for the forest sector - with consideration of energy, global warming, risk, and regional development*".

Peter Lohmander has recently chaired these international conferences:

2010: "European Biomass and Bioenergy Forum", MarcusEvans, Stockholm, Sweden, September 13-15, 2010.

2009: "European Biomass and Bioenergy Forum", MarcusEvans, London, UK, 8-9 June, 2009.

2009: "Economics of Forestry and the Forest Sector", Saint Petersburg, Russia, 26-27 March 2009.

2008: "Energy Forum", Stockholm, 6-7 Feb 2008.

2007: "Operations Research in the Forest Sector", INFORMS International, Puerto Rico, USA, 2007"

Peter Lohmander has been the supervisor and advisor of five PhD students that have already defended their doctor degrees and become doctors. Two of these former PhD students are now professors. Three of his PhD students that have obtained their PhDs have come from P.R. China, one from Iran and one from Sweden.

Peter Lohmanders website: <http://www.lohmander.com/>