

**Lohmander, P., Economic forest management with consideration of the forest and energy industries, WFC 2009, XIII World Forestry Congress, Abstracts, Theme: 5. Development opportunities, Subtheme: 5.2 Industry and forest development, Buenos Aires, Argentina, 18-23 October, 2009**

**Abstract of the paper:**

The bio energy sector is rapidly growing in Europe, partly as a result of these new targets concerning of the European Union, EU. In the year 2020: a) The emissions of CO<sub>2</sub> should at least be 20 % lower than in 1990. b) At least 20% of the energy utilized within EU should be renewable. c) In the transport sector, at least 10% of the energy used should be renewable. Within EU, depending on the initial conditions, different countries have more or less restrictive target levels. Sweden, as an example, must reach the level 49% of renewable energy in 2020 since the initial level in 2005 is about 40%. The paper presents an analysis of the optimal joint dynamic development of forest management, the forest products industry and the energy industry in Sweden. The total present value of the relevant sector is maximized over a fifty year horizon, using the latest available estimates of relevant parameters. In Sweden, the forest growth has strongly exceeded the harvest level since the year 1926. In 1926, the stock level was 1747 Mm<sup>3</sup>sk and the latest observation (period 2002-2006) is 3234 Mm<sup>3</sup>sk. The optimal development path was determined for three alternative levels of the lowest acceptable stock level: 2500 Mm<sup>3</sup>sk, 2800 M<sup>3</sup>sk and 3234 Mm<sup>3</sup>sk. The optimal total present values with 5% real rate of interest and an exchange rate of 9.38 EURO/ Swedish crown of the first 50 years was 183 billion EURO, 178 billion EURO and 170 billion EURO respectively. This means that it would be profitable to increase harvesting. The optimization also shows that the bio energy production should increase considerably. In the analysis, the import of raw material was assumed to be zero. Furthermore, the use of stumps was not considered as an option. The forest growth was assumed to be constant during the planning period. Even if the forest growth is on average positively correlated with the forest stock level, it is not obvious that the growth during the investigated period is negatively affected by increased harvesting because of these reasons: 1. New plantations grow faster than old plantations because of the use of genetically improved plants. 2. The harvests should primarily take place in forest stands that are initially much older than the economically optimal harvest ages. As a result, the economic motive to decrease the stock level is even stronger than what the optimized total present values indicate.

**Weblinks to the abstract and conference:**

<http://www.cfm2009.org/es/programapost/resumenes/resumenesen.asp?offset=900>

**Weblink to a copy of the abstract:**

<http://www.Lohmander.com/LohmanderWFC2009.doc>

<http://www.Lohmander.com/LohmanderWFC2009.pdf>