

Norwegian emissions of CO₂ 1987 - 1993

A study of the effect of the CO₂-tax

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10. Summary and Conclusion (preliminary version)

A CO₂-tax (carbon tax) was introduced in Norway in 1991. The tax was imposed in addition to the existing tax on mineral oil (the basic tax). The study attempts to establish whether changes in the CO₂-tax and the basic tax have had any effect on emissions of CO₂ during the period 1987-93. It is not enough just to compare changes in the tax with changes in emissions over time, because the emissions are also affected by a number of other factors. About 60 per cent of the CO₂-emissions are subject to tax. Thus, for the remaining 40 per cent, the CO₂-tax is not the explanation of any reductions in emissions. The total CO₂-emissions decreased from 35.6 million tonnes in 1990 to 33.9 million tonnes in 1991. The emissions increased to 37.2 million tonnes in 1994, simultaneously with a reduction in the taxes.

Stationary sources (heating) account for about 40 per cent of the emissions. The analysis of emissions from stationary sources in the production sectors covers about 40 per cent of these emissions. The results show that the CO₂-tax helped to reduce CO₂-emissions by up to 10-20 per cent per year in certain sectors, while the reductions have not been as great in other sectors. According to the calculations, emissions from stationary sources in the production sectors analysed were reduced by between 75 and 157 thousand tonnes per year during the period from 1987 to 1993, because of the CO₂-tax. The emissions, as part of the stationary emissions studied, were reduced by between 1.5 per cent and 5.9 per cent per year.

The CO₂-tax led to relatively small reductions in the stationary use of energy in households (energy use connected with the dwelling). The effect of the CO₂-tax was greatest in 1991 and 1992, with a reduction of about 3 per cent in the consumption of oil and kerosene.

Emissions of CO₂ from mobile sources account for about 40 per cent of the total CO₂-emissions, and the production sectors and households are responsible for respectively 70 and 30 per cent of these emissions. In the analysis of CO₂-emissions from the use of transport in the production sectors, the change in CO₂-emissions relative to the gross product (CO₂-intensity) was decomposed in order to obtain a picture of the cause of the change. The three components considered were changes in the structure of business and industry (sector structure), changes in energy use relative to gross product (energy intensity) and changes in the composition of the consumption of different transport oils. The CO₂-intensity decreased by 3 per cent per year from 1988 to 1992. The main reason was changes in the sector structure. The CO₂-tax may have influenced the sector structure and therefore the CO₂-intensity, but the degree to which this occurred is uncertain.