

IMPACT OF OIL SHALE USE ON GREENHOUSE GAS EMISSION PROJECTIONS FROM ENERGY SECTOR IN ESTONIA

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Energy sector is the main source of greenhouse gas emissions in Estonia. In 2007, the energy sector contributed about 86.5% of total emissions, totalling 19.1 Mt in CO₂ equivalent. Compared to the base year 1990, the emissions were about 48% below that level (41.9 Mt CO₂eqv). Most of the energy sector emissions – 70% originate from oil shale use.

The analysis of emission projections has been carried out using the NEEDS model. The basic assumptions for GHG projections are based on the National Long-term Development Plan for the Fuel and Energy Sector until 2020.

The following scenarios were compiled: With measures (WM) scenario. In this scenario approved or already decided policy measures are taken into account. The following basic assumptions were considered in the scenario: Estonian power plants have to comply with the EU directive on the limitation of emissions into the air from large combustion plants. There is planned reduction of the use of oil shale as the main energy source, as the result the share of oil shale reduces from 54% in 2006 to the level of 33% in 2020. This reduction of the share of oil shale is balanced with the growth of the use of biomass and wind, also with some increase of the use of natural gas. Thereby, the share of no other source of primary energy will exceed 20%.

There will be also some essential changes in the electricity generation structure, first of all the decreasing share of electricity generation in the conventional condensate power plants. This share is reducing from the level of 88% in 2006 down to the 70% in 2020. Thereby the share of CHP plants is growing from the level of 11% in 2006 up to 14% in 2020. The most essential development will take place in wind power sector: the share of wind based electricity will increase from the level of 0.8% in 2006 up to 16 % in 2020.

There are two more scenarios compiled - with additional measures (WAM) and without measures (WoM - business as usual). WAM scenario takes into account both approved and already decided as well as planned policy measures. In WoM scenario all measures described were excluded. The results of WM scenario are compared with the results of the WAM and WoM scenarios.

The main results of the modelling indicate that in case of balanced economic development of Estonia, the Kyoto Protocol reduction target is far away for all considered scenarios, even without implementing any specific mitigation measures. Estonian CO₂ emissions will not climb up to the Kyoto limit (8% reduction by 2012 compared to 1990) neither to post-Kyoto limit (20% reduction by 2020) under any scenario. Main driving factors for CO₂ reduction are the efficiency improvement of fossil fuels combustion technologies, and increase in the share of renewables and wind related CHP.