Finnish study on climate change: Procrastination over mitigation measures could prove costly

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Forecasts about global warming and its consequences are shrouded in uncertainty. Research scientists maintain that the risks associated with climate change are high, but are unable to estimate accurately how easily temperature reacts to changes in the levels of carbon dioxide. According to Tommi Ekholm, Research Scientist at VTT Technical Research Centre of Finland, who has modelled the costs of climate change mitigation measures in his recent doctoral dissertation, it is because of this uncertainty that we need to accelerate measures to mitigate global warming rather than hold back.

According to Ekholm's calculations, curbing climate change to two degrees would require worldwide emissions trading and a price of approximately EUR 20 per one tonne of CO2 in 2020. Current emissions trading systems are regional, and the price in the EU system, for example, has at times been as low as EUR 2-3 per tonne.

"By the end of the century, we should be looking at prices well in excess of EUR 100", Ekholm says.

Ekholm portrays the setting as a question of risk management: Mitigation measures are likely to end up costing less if they are instigated straight away. If the sensitivity of climate change turns out to be lower than the consensus forecast, the intensity of measures can be pulled back. If, however, the sensitivity proves to be higher than

anticipated, the cost of the then inevitable cuts to emissions may rise to intolerable levels in the short term.

"In the worst case scenario, the price of one tonne of CO2 could rise to levels as high as EUR 1,000. The probability of this scenario is in the region of a few per cent. The risk is not huge but not marginal either."

In his dissertation, Tommi Ekholm compared different ways to cut emissions globally in a cost-effective manner. He believes that the most cost-effective cuts can be made in electricity production, for example by substituting wind-powered electricity production for coal-powered electricity production.. The area with the second most potential for cost-effective cuts is the industrial sector, where emissions can be reduced by introducing new fuels and by increasing energy efficiency. In other sectors, such as transport and agriculture, the ways to cut emissions are still being developed. This is why the costs attributable to these sectors are considerably higher than those of electricity production or the industrial sector.

Tommi Ekholm's dissertation in systems and operations research, "Risks, costs and equity - Modelling efficient strategies for climate and energy policy", will be examined at Aalto University in Finland on 6 September 2013. Professor Erin Baker from the University of Massachusetts serves as the opponent and Professor Ahti Salo from Aalto University as the chair.

Provided by VTT Technical Research Centre of Finland