

BENEFITS AND COSTS TO CHINA OF A CLIMATE POLICY - THE IMPORTANCE OF AVOIDED CROP LOSS**K. Aunan¹**, D. O'Connor², Z. Fan³, T. Berntsen¹, T.H. Persson⁴, H. Vennemo⁴¹*Center for Climate and Environmental Research, Oslo, Norway*²*United Nations, New York, USA*³*Asian Development Bank, Manila, The Philippines*⁴*ECON Analysis, Oslo, Norway*

In future agreements to cut greenhouse gases, Chinese commitment will be a key to global commitment. Using a Computable General Equilibrium (CGE) model of the Chinese economy we discuss the cost and benefit to China of taking on a climate commitment. A climate policy is modelled as various levels of a CO₂-tax. We find that a climate commitment gives significant benefits to China since associated reductions in NO_x and particles increase agricultural yields and improve public health. Inclusion of a NO_x-surface ozone-crop loss linkage in a CGE model is to our knowledge a novelty and was developed through the following steps: NO_x emissions were projected based on sectoral emission coefficients contained in the CGE. By means of a 3-dimensional chemical transport model (CTM) for the lower atmosphere, we model the impact that a given reduction of NO_x has on the level of surface ozone across China. The results were used to derive scenarios for the seasonal average 7 hrs d-1 concentration of surface ozone for the period March-October (M7) for each Chinese province. Combining the obtained results with crop production data at a province level and Weibull dose-response functions from the literature, we derived stepwise linear functions for crop loss and annual emissions of NO_x, which were integrated in the CGE model. We find that the agricultural benefit has about the same magnitude as the health benefit, and that China may reduce its CO₂-emissions by 15 per cent without suffering a welfare loss.