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Analyses of Some Low Carbon Scenarios: Case of Nepal

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Summary

This study analyzes energy use and associated GHG emission in Nepal during 2010-2050 in the business as usual (BAU) and three low carbon scenarios. The low carbon scenarios are the three carbon tax (CT) scenarios considered in Asian Modeling Exercise (AME), i.e., with the carbon price in 2020 being $10 per ton of CO_2 equivalent (CO_2e) in CT10 scenario, $30 per ton of CO_2e in CT30 scenario and $50 per ton of CO_2e in CT50 scenario and increasing by 5% per annum till 2050 in each scenario. The AIM/Enduse Model of Nepal has been used for the analysis.

In the BAU case, the study shows that the energy related GHG emission, which is presently low, will grow by 7 fold, i.e., at a compounded annual growth rate of 5.1% per annum during 2010-2050. The transport sector, which had a share of 35.6% in 2010, would continue to be the largest GHG emitting sector during the period and would contribute to more than half of the total energy related GHG emissions by 2050.

The study shows that increasing the use of biomass energy to replace coal use in the industry sector would be cost effective in the carbon tax scenarios. In the residential and commercial sectors, electricity use in cooking would be an attractive option to reduce the use of LPG for cooking in these scenarios. Similarly, increasing the use of electricity and biofuels and a reduction in the consumption of petroleum products in the transport sector would be cost effective in the carbon tax scenarios. Given the high potential of using hydroelectricity in the country, the study also carries out sensitivity analysis with respect to the costs of hydropower development, electric vehicles and battery.