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## **Climate Change Mitigation, Economic Growth and the Distribution of Income**

by

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In October 2008, the Australian Government released a major report on *Australia's Low Pollution Future: The Economics of Climate Change Mitigation*. In that report, various scenarios are used to explore the potential economic effects of climate mitigation policy on Australia. Two scenarios, CPRS-5 and CPRS-15, examine the costs of the Government's proposed Carbon Pollution Reduction Scheme. The CPRS-5 scenario aims to reduce emissions to 5 per cent below 2000 levels by 2020. It is consistent with stabilisation at around 550 parts per million of carbon dioxide equivalent (ppm CO<sub>2</sub>-e) in the atmosphere by 2100. The CPRS-15 scenario aims for a 15 per cent reduction and is consistent with stabilisation at around 510 ppm.

In assessing the likely effects these policies on the future growth of output and employment by industry, the Government's report relies mainly on economic modelling using the MMRF applied general equilibrium model of the Australian economy. Results are reported for 58 industries. This paper begins by using the same model to reproduce the analysis conducted for the report. However, this time the MMRF model is enhanced by a labour market module which allows the employment results to be extended to 81 occupations and 64 skill groups. The enhanced model is then used in a top-down configuration with the ORANI-ID and ORANI-MS models to generate results for the distribution of income.

The ORANI model (and its generic derivative ORANI-G) is a comparative static applied general equilibrium model that has been used extensively for disaggregated policy analysis in Australia over many years. ORANI-ID is a new version which adapts ORANI-G so that it can address policy questions concerning the distribution of income. In particular, in ORANI-ID, income redistributions between households (taken collectively), corporate trading enterprises, financial trading enterprises, the government and foreigners (the "institutions") are modelled by the inclusion of the associated current and capital accounts from the Australian System of National Accounts. Within the household sector, changes in disposable income from unincorporated enterprises (differentiated by 17 industries), compensation of employees (differentiated by 81 occupations), property income, and net transfers from other institutions are separately modelled. On the income side, one hundred types of recipient, corresponding to the one hundred disposable income percentiles defined on personal incomes, are identified. On the expenditure side, six hundred types of household are identified, this time differentiated by the ages of their members.

Finally, ORANI-ID is supplemented with a microsimulation model ORANI-MS which uses ORANI-ID results to update the incomes of more than 13,500 persons. The effects of the climate change mitigation policies on the incomes of a wide range of socio-economic groups can then be obtained by aggregation.