

# GTAP Advisory Board meeting

## Summary of ABARE activities

Purdue University  
25-26 June 2001

ABARE currently uses the Global Trade and Environment Model (GTEM), the successor to MEGABARE. Some GTAP based analysis has also been undertaken over the past year.

## **1. Model developments**

The major focus of GTEM developments over the past year has been on building the capacity to undertake energy and emission projections, international climate change response policy and trade liberalisation. ABARE has undertaken a significant program of model development work to project global energy demand and supply conditions under various conditions. This work has also been important for the analysis of international climate change policy as it has allowed ABARE to better undertake emission projections for developed and developing countries. ABARE has also undertaken a significant amount of development work in the area of international climate change response policy analysis. For example, GTEM now incorporates the ability to model restrictions placed in international trading. Finally, development work has been done on improving the protection database in GTEM and techniques have been developed to analyse international trade liberalisation issues in a dynamic context.

## **2. GTEM and GTAP model applications**

### *(a) Climate change*

Over the past year, ABARE has continued its program of research into the economic impacts of international climate change response policy. A major focus of the program has been examination of the economic implications of possible negotiated implementation outcomes of the Kyoto Protocol.

The analysis examines a range of Kyoto scenarios that incorporate varying assumptions on the extent of access to international emissions trading and to sinks under Article 3.4 of the Kyoto Protocol, reflecting negotiating positions in the international arena. Macroeconomic impacts for Annex B and non-Annex B regions as a whole are examined, together with the impacts on the global carbon market and fossil fuel prices. The work also includes detailed sectoral analysis for Australia. The research was published in ABARE's paper for the climate change session at ABARE's Outlook 2001 conference in March.

ABARE has recently completed a disaggregation of the aluminium and alumina industries from the nonferrous metals sector in the GTAP database and of bauxite from the other minerals sector. A study focusing on the impacts of a Kyoto-style emission abatement framework on this emission intensive industry has recently been completed. The potential shift in aluminium production from developed countries (where an emission penalty applies) to developing countries (where emissions are not penalised) is quantified. The paper is available on ABARE's website, [www.abareconomics.com](http://www.abareconomics.com).

*(b) International Energy Program*

A second stream of work undertaken using GTEM is analysis of international energy issues, particularly relating to energy markets in the Asian region. Five major projects are being conducted in this program:

*(i) The world coal outlook to 2010*

A key objective in this study is to provide a baseline or business as usual projection of likely developments in the world coal market over the period to 2010. This includes an analysis of major demand trends by region, including trends in the demand for electricity and for iron and steel. The study also assesses major new policies or other important developments that could affect the size and structure of the coal market over the projection period. These new policies or developments include international responses to the threat of global climate change; ongoing deregulation of electricity sectors, especially in APEC economies; further liberalisation of markets in developing economies including the removal of energy subsidies; and changes in the competitiveness of the major coal supply regions, especially relating to changes in labor productivity.

*(ii) The potential for LNG trade with east China*

GTEM is used in this study to analyse the potential demand for natural gas in east China (defined here as the provinces of Shanghai, Jiangsu, Zhejiang and Fujian) and to compare the competitiveness of domestic natural gas supplied by pipeline with imported LNG. The study also examines some of the factors that will be critical to establishing a secure and stable LNG market in China and assesses the capacity of the world natural gas industry to supply China's growing demand.

*(iii) Electricity sector deregulation in North East Asia*

The key objective in the project is to provide quantitative analysis, based on applications of GTEM, of the broad economic impacts of policies to deregulate electricity supply industries in Japan, Korea and Chinese Taipei. The project assesses the benefits to these economies through lower electricity prices and more open and transparent electricity markets that are expected to flow from regulatory reform. It examines the potential benefits of reform at both the economywide level – through impacts on gross domestic product and sectoral output – as well as at the energy sector level – through impacts on energy prices, consumption and trade.

*(iv) Impacts of developments in the 'new economy' on energy outcomes in APEC*

The objective in this study is to analyse the impact of the widespread use of information and communication technologies on economic growth and energy demand in the APEC region. It uses GTEM to examine the implications of increases in economywide productivity that appear to result from increased uptake of these technologies. It then examines the likely impacts on economic structure and the implications of these changes for energy consumption, production and trade.

*(v) Japan's energy future: a scenario analysis*

The objective in this study is to examine some of the key long run economic and structural changes that are occurring in the Japanese economy and energy sector and to consider the implications of these for the level and structure of energy demand in Japan. The key changes that are examined are long run sustainable growth rates; energy sector deregulation; and climate change response policies. On the basis of analysis of these changes and of alternative policy responses to them, the study develops a most likely outlook for Japan's economy and energy sector in 2010.

*(c) Implications of further agricultural reform in the WTO negotiations*

ABARE is also continuing its analysis of agricultural trade liberalisation issues using GTEM. The major focus has been on an analysis of export measures in relation to the WTO agricultural negotiations. ABARE's work has involved an analysis of how successful the export competition aspects of the Agreement on Agriculture are in reforming export subsidies and uses this information to highlight critical issues that will result in substantial reforms in this area. A number of revisions to the GTAP database have been made during the course of the project. This has included:

- (i) The elimination of export subsidies by non-subsidising countries. For example, export subsidies on sugar and rice in Japan were removed. Additional details of the modifications to the version 4 database were provided in ABARE's comments on version 5.
- (ii) The elimination of export taxes by countries that do not tax their agricultural exports. For example, the removal of export taxes on many agricultural commodities by Brazil and Mexico and taxes by China on ruminant meat exports.
- (iii) For those countries with export subsidies, the replacement of 1995 GTAP estimates with estimates of likely rates based on historical data from the WTO notifications. The latest data used was for 1998.

### ***Recent publications***

Curtotti, R. and Woffenden, K. 2001, *Climate Change and Aluminium: Impacts of International Climate Change Policy Response*, ABARE Current Issues 01.3, May, Canberra.

Freeman, F., Mélanie, J., Roberts, I., Vanzetti, D., Tielu, A. and Buetre, B. 2000, *The Impact of Agricultural Trade Liberalisation on Developing Countries*, ABARE Research Report 2000.6, Canberra.

Freeman, F. and Roberts, I. 1999, Developing countries: impact of agricultural liberalisation, ABARE Current Issues no. 2000.1, July, Canberra.

Polidano, C., Heyhoe, E., Hester, S., Fisher, B.S., Woffenden, K. and Jakeman G. 2001, 'The Kyoto Protocol: the state of negotiations and implications for the Australian economy', in *Outlook 2001*, Proceedings of the National Agricultural and Resource Outlook Conference, February 27 – March 1, vol. 1, *Natural Resources*, ABARE, Canberra, pp 47–63.

Roberts, I., Podbury, T and Vanzetti, D. 2000 'WTO trade reform: maintaining the momentum for liberalisation', Proceedings of the National Agricultural and Resources Outlook Conference, Canberra, 29 Feb.–2 March, vol. two, *Agriculture and Regional Australia*, ABARE, Canberra, pp. 83–92.

Roberts, I. 2001 'WTO agricultural reforms: issues and requirements for a successful agreement', Proceedings of the National Agricultural and Resources Outlook Conference, Canberra, 27 Feb.–1 March, vol. 2, *Agriculture and Regional Australia*, ABARE, Canberra, pp. 211–19.