

EVALUATING THE IMPACT OF CLIMATE CHANGE POLICY: DOES THE CHOICE OF ECONOMIC MODELS MATTER ?

Many experts believe the economic models currently employed by environmental policymakers throughout Europe provide an incomplete picture of the full economic costs of compliance with the Kyoto protocol.

Measuring the Economic Impact of Kyoto

As a recent ICCF study illustrates, an accurate portrayal of the costs of complying with greenhouse gas (GHG) emission reduction targets depends largely on choosing an economic model that captures all the short-and medium-term costs of adjusting to higher energy prices or regulatory mandates on the economy as a whole. (See "Economic Modeling of Climate Change Policy" at www.ICCFglobal.org.)

For example, some economic models such as the PRIMES model used by EU environmental agencies are designed only for measuring sectoral effects, not economy-wide effects. PRIMES (a partial equilibrium model) is primarily designed to show the effect of policy changes on energy markets. It can calculate the direct cost implications of reduced energy use but not the economy-wide impact on GDP, employment, investment, etc. Thus, the results of this model, which show a reduction of only 0.12% in GDP to the EU in 2010 from complying with the Kyoto Protocol, are not an accurate measure of the total costs to EU households, businesses, the economy and government.

Such reliance on results from PRIMES has led EU officials, industry and households to believe that the costs of achieving the Kyoto Protocol targets and the further cuts planned for the second commitment period will be relatively small.

General equilibrium models, which measure the "big picture" impacts on an economy after it has had time to adjust (over 30 to 40 years) to higher energy prices, show GDP losses of about 1% per year, which are an order of magnitude greater than PRIMES.

Macroeconomic models provide an assessment of the overall economic costs of meeting emission targets where the short-term, frictional costs of adjustment are included. These models, which US scholars and climate policy modelers began using in the early 1990s to measure the impact of Kyoto on the US economy, quantify the impact on employment, investment, budget receipts and GDP growth when an economy is "shocked" by having to make quick changes in its capital stock, production processes, lifestyles, etc.

When macroeconomic models are used to measure Kyoto's effects on the EU, the impacts are an order of magnitude greater — 1.8% to almost 5% less GDP in 2010— than those derived from sectoral or general equilibrium models. (See "Heroes and Villains" at www.ICCFglobal.org.)



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The post-2012 carbon emission targets, such as the 60% reduction by 2050 target proposed in the UK's Energy White Paper earlier this year or the 70 to 100% being discussed by other EU member governments and EU Commission officials will require additional sacrifice of investment, jobs and GDP. To see why, one only has to look at recent emission forecasts from various international agencies. Most recently, the World Energy, Technology and Climate Policy Outlook predicted that European CO₂ emissions will increase by 18% in 2030 compared to the 1990 level.

Planning for COP 9

The increased flexibility of the European Commissions' emission trading proposal is due in part to the discussions and debate generated by the ICCF's analysis of the cost of carbon reductions for the member states. The Commission's willingness to allow the use of the Clean Development Mechanism and Joint Implementation to reduce the cost of cutting carbon emissions in member states is due in part to policymakers being provided with comprehensive reports which showed significant impacts on GDP, employment and investment.

The challenge facing policymakers planning for further GHG emission reductions for the second commitment period at the Conference of the Parties in Italy later in 2003 will be to shape policies which are cost effective and "sustainable" from the perspective of industry as well as households and other stakeholders. Climate policy experts need to provide decision-makers with the results of a range of macroeconomic models results in which the underlying assumptions on the rate of capital stock turnover and technological change are clearly delineated.