Data Requirements for Carbon Accounting in Scotland

Scottish Government Carbon Assessment Project Workshop
25 November 2008

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Overview

• Economic and environmental data collected and reported in a **consistent** and **compatible format** to analyse economy-environment interaction
  
  • NAMEA accounting concept
  
  • Environmental input-output (IO) analysis
  
  • Data issues for Scotland and the rest of the UK
  
  • Accounting for emissions embodied in trade
  
  • Extending accounting frameworks to analyse impacts of policy and other disturbances on Scottish carbon requirements
First requirement – Scottish environmental IO accounts or NAMEA framework

• Eurostat – National Accounting Matrix including Environmental Accounts
  • Sectoral economic accounts (IO) augmented with physical data on emission and/or energy use for each production and final consumption sector

• Issues identified in Scottish case study for the Scottish Environmental Accounts Working Group in 2003
  • Importance of region-specific data
  • Bottom-up vs top-down emissions estimates
  • Issues of degree of sectoral breakdown in economic accounts
Why an input-output approach?

• Our carbon footprint = total (direct, indirect and induced) carbon use/generation embodied in different types of production and consumption activities

• Natural application of IO multiplier analysis

• Captures emissions under different accounting principles
  • Production accounting principle – Kyoto
  • Consumption accounting principle - footprints
IO data requirements

• Economic IO accounts in *analytical* format
  • Symmetric (industry by industry or commodity by commodity)
  • Basic/producer prices

• Problem at UK level – no analytical IO table since 1995 (produced in 2000) and no data on imports in IO format: ONS – “not a priority”

• Undermines urgent research and appears to contravene UK obligation under the European System of National Accounts (ESA 95)

• DEFRA project – estimated analytical IO tables produced by SEI

• *Scotland in a much stronger position* (though ultimately dependent on ONS position)
Scottish IO accounts

• Well served on economic side
  • Scottish Government IO team – regular production of 128 sector analytical IO tables
  • Regular consultation with users through IO Expert User Group
  • Experimental data on imports data in IO format and disaggregating key sectors

• Strong foundation relative to other UK regions and UK national economy
What can/needs to be done for Scotland?

- Problem – no corresponding sectoral environmental IO account (pilot CO2 account for 1999)

- 2008 - Scottish Government Steering Group on Additional Measures of Progress
  - Recommendation to develop environmental IO accounts
  - Informed by SEPA-sponsored workshop March 2008

- We are in a good position to exploit our existing strengths

- Scotland could independently meet ESA 95 requirements on production of analytical IO tables of domestic production and imports, and develop NAMEA
Exports, imports and environmental trade balances

• Scottish environmental IO accounts could be used to attribute local emissions to end user, but in such analyses

  • Share of emissions allocated to (external) export demand – implications for meeting regional/national targets for domestic emissions reductions

  • No account taken of emissions embodied in imports – impacts of local consumption decisions on other countries/global environment

• Carbon ‘trade balances’, carbon footprints

• All of these can be examined within an inter- or multi-region IO framework – but requires UK and international trade flow data in IO format
Conclusions on data requirements?

• IO approach to accounting for emissions appropriate, rigorous and transparent

• Permits standard approach (international comparisons)

• Minimum requirement – environmentally augmented analytical IO table for Scotland (Scottish NAMEA) – investment priority

• Given that Scotland must contribute to UK targets, and importance of intra-UK trade, extend to interregional IO framework for Scotland and the rest of the UK/other UK regions?

  • Dependence on ONS position regarding production of IO data

• Carbon footprints – international/multi-region IO framework

• Need for sustainable networks to oversee regular accounting
Current research activity

• TSG/ESRC Collaborative Government studentship on carbon accounting using IO approach
  • policy case studies
• ESRC Climate Change Leadership Fellowship on investigating the pollution content of trade flows
  • IO ideal accounting framework for footprints and other indicators
  • However, if need to model impacts of changes in economic activity and/or policy on carbon indicators and trade balances, need to identify, understand and capture transmission mechanism from change/policy to environmental variables
  • Interregional extension of AMOSENV1 CGE modelling framework