

Policy applications of environmental accounts



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Structure

- 1. Input-Output Analysis
 - What is it and what can it do?
- 2. Structural decomposition analysis
 - Dutch CO2 example
- 3. What's happening now in Australia?

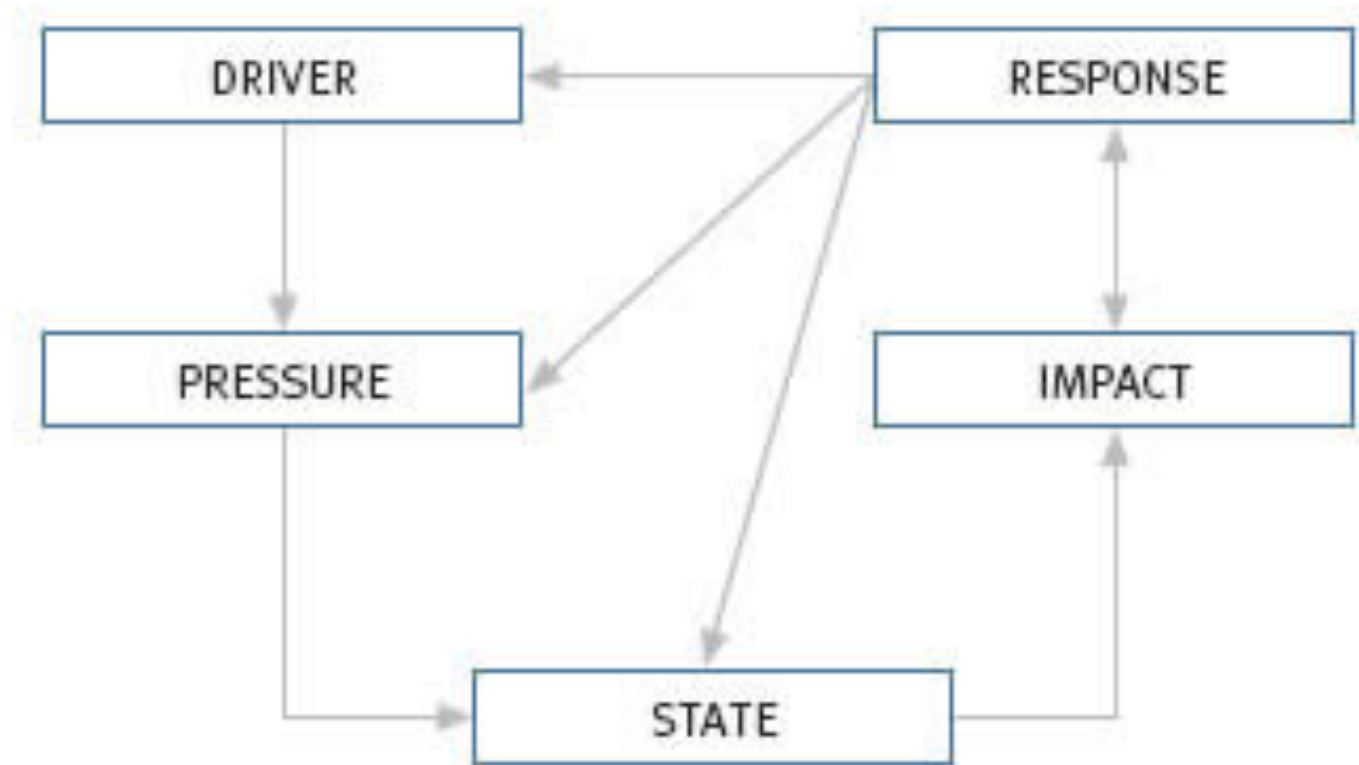


Uses

- "SEEA is intended to meet the needs of policy makers by
 - providing indicators and descriptive statistics
 - serving as a tool for strategic planning and policy analysis to identify more sustainable development paths"



Helps inform at all stages



Policy applications

- Further applications of environmental-economic accounting:
 - I. Input-Output (and Supply-Use) analysis
 - II. What causes indicators to change?
 - III. Modelling change



What is Input-Output analysis?

- As an analytical tool, input-output data are integrated into macroeconomic models in order to analyse the **link between final demand and industrial output levels.**
- Important to know the driving forces and indirect effects of resource use and generation of pollutants



I. Input-output analysis

- Previously, described direct resource use and generation of pollutants associated with production
- Important to know the driving forces and indirect effects of resource use and generation of pollutants
- Also important to know consequences for economic growth and job numbers
- I-O analysis provides information on this

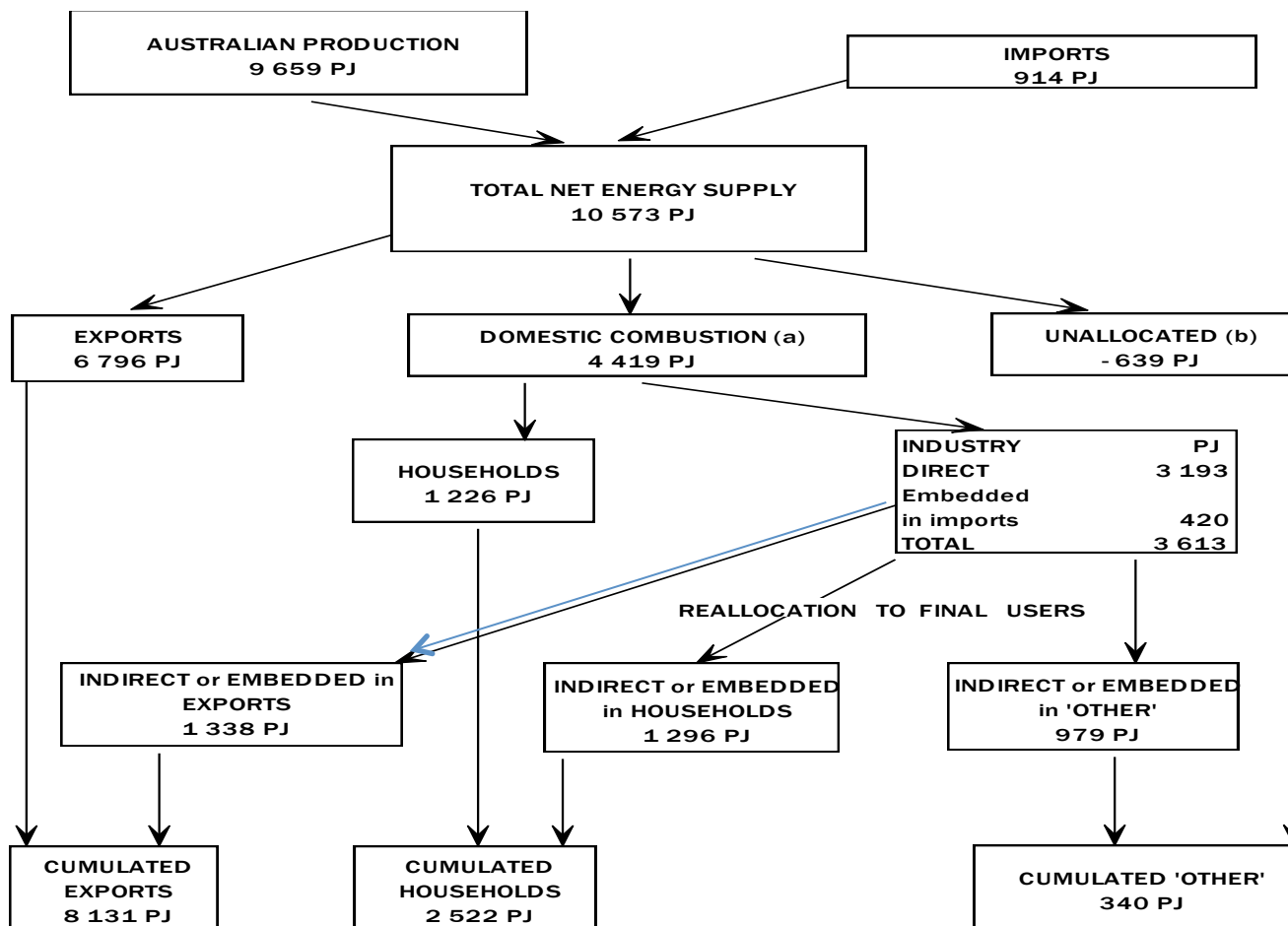


Input-output analysis: indirect effects

- Used to redistribute emissions (or resource use) from industry to the final user - i.e., where the demand is coming from
- Used to link economic activity with pollution emissions and energy use (physical)
- A common application is the calculation of the total energy requirements of final products



I-O analysis: Energy supply and use, allocated to final users



(a) Use by industry and households

(b) Changes in stocks and statistical discrepancies

Note: Conversion losses have been allocated to the using sector



Structural decomposition

- Technique to distinguish different sources of change (overall or indicator) over time
- Environmental policy vs. other factors?
- Changes in composition of the economy?



Structural decomposition

- Netherlands GHG emissions:
- 20.3 % increase in CO₂ emissions (1987-98)
 - economic growth (production) + 35 %
 - improved efficiency -11.5 %
 - structural change -3.2 %



Other country uses...

- assess the indirect and direct pollution content of foreign trade for Netherlands
- environmental effects of Norway's long term economic plans
- material flow analysis for promoting Japanese recycling activities
- evaluate the reduction of emissions due to environmental protection expenditure in Japan



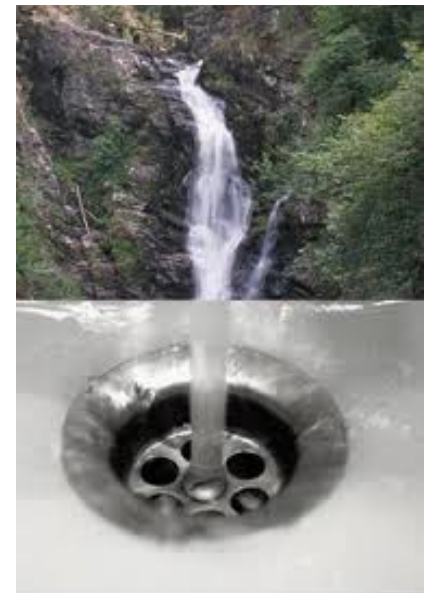
What's happening now in Australia?

- \$10b National Water Management Plan
- Compare environmental & socio-economic performance of industries
- Potential for increasing effective water supply & improving water productivity
- Water pricing & incentives for water conservation
- economic models for forecasting water demand



Australian water accounts

- ABS Water Accounts relatively new tool for policy makers and researchers
- Potential in decision-making and analysis yet to be fully realised



Australian water accounts - example

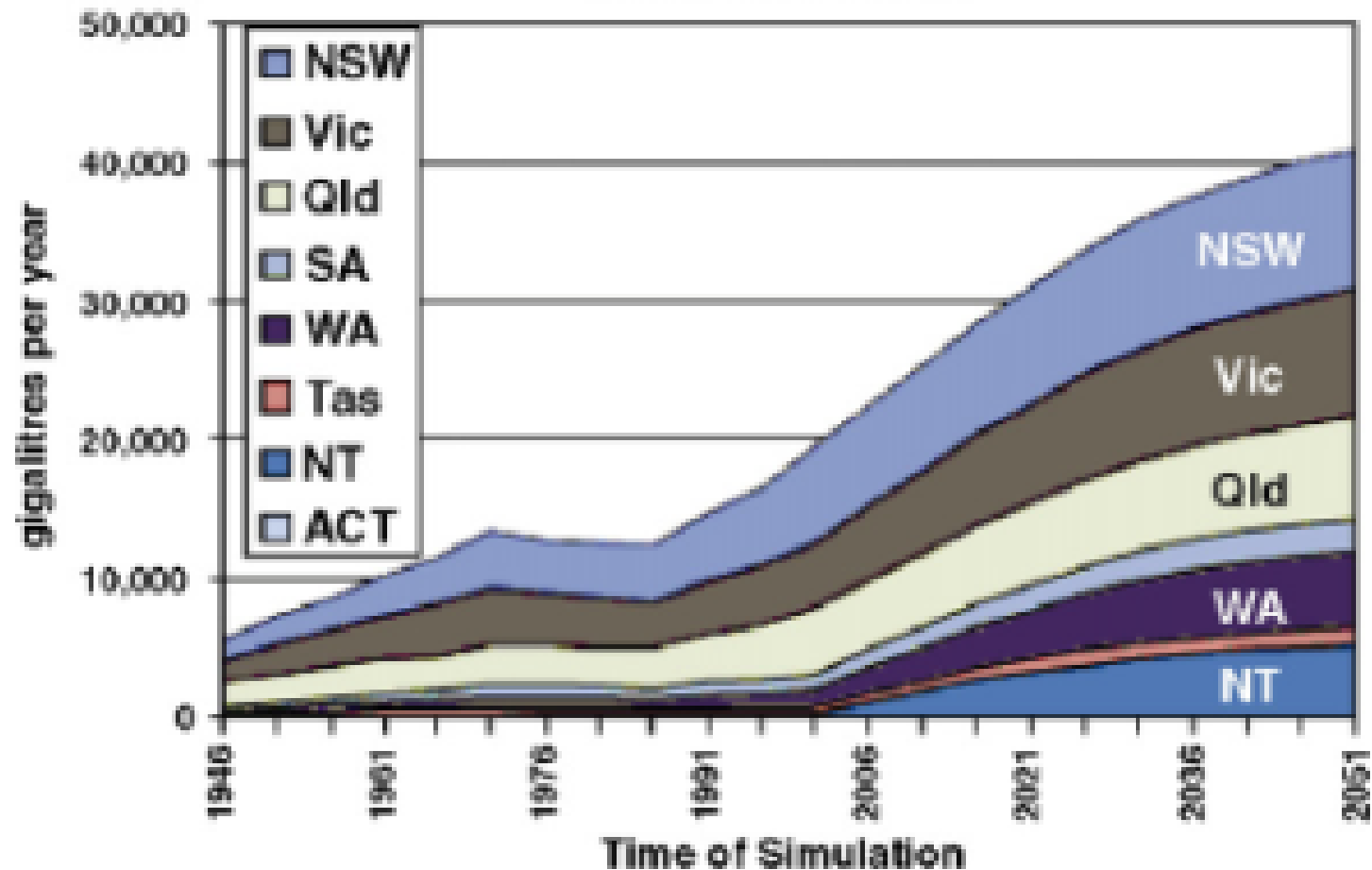
- Models developed to estimate the impact of increased water prices on water use in the southern MDB
- In short-term, demand for irrigation water unresponsive to water price
- In long term, respond by altering the crops they irrigate
- however, investment in on-farm water saving technology unlikely to be justified in terms of water saved.



Australian water accounts – forecasting demand



Water User - States



CO2 emissions embodied in the Australian international trade in goods

- Why is this important?
 - Carbon leakage through international trade has been identified as a limitation of global reduction in CO2 emissions.
 - The relocation of production activities from less carbon-intensive economies to more carbon intensive economies increases the global production of CO2.



GHG Emissions, and economic production and consumption

Two standard approaches:

Production Approach

- GHGs physically produced by industry households within an economic territory

Consumption Approach

- GHGs embedded in Final demand + imports - exports



Production vs. Consumption based measurement



IMPORTS



**AUSTRALIAN PRODUCTION
USED IN AUSTRALIA**



EXPORTS

CONSUMPTION BASED EMISSIONS

PRODUCTION BASED EMISSIONS



Informing the debate

- International negotiations on climate change
- Consumers may lack constituency to alter production methods
- Producers lack incentives to improve methods
- Governments play a key role



PRODUCTION BASED RESULTS

- E&G industry highest emitter, followed by Agriculture and Manufacturing
- Combined they accounted for:
 - 74% of emissions
 - 15% GVA
 - 14% Employment
- Commercial and Services
 - 5% Emissions
 - 62% GVA
 - 70% Employment



ADJUSTING FOR SEEA

RESIDENCE vs. TERRITORY BASIS

- EMISSIONS OF TOURISTS
- BUNKERING

Applied input-output analysis to determine emissions induced by final demand



Production vs. Consumption based measurement



PRODUCTION BASED EMISSIONS

IMPORTS
174 Mt CO₂-e

**AUSTRALIAN PRODUCTION USED IN
AUSTRALIA**
357 Mt CO₂-e

EXPORTS
228 Mt CO₂-e

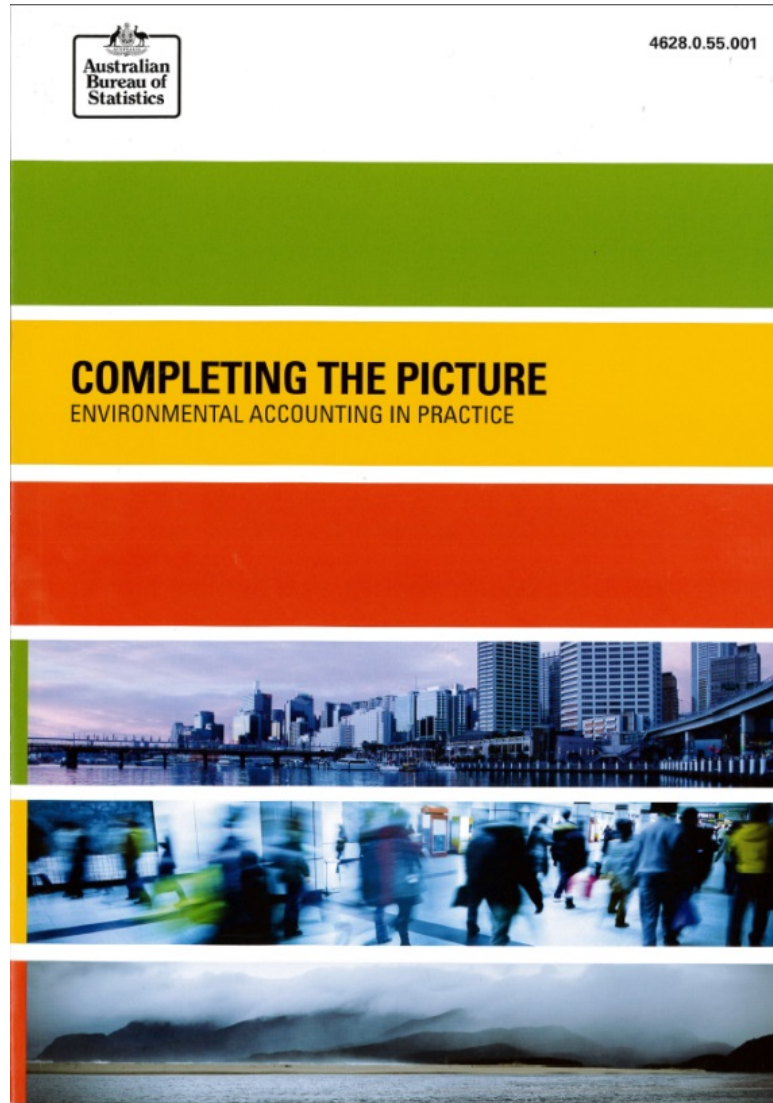
CONSUMPTION BASED EMISSIONS

585 Mt CO₂-e

531 Mt CO₂-e



Completing the Picture: Environmental Accounting in Practice



Summary

- score keeping and management
- learn how the environment and economy interactions work
- analysing the environmental and economic consequence of policy options
- framework for modelling and forecasting, environmental effects related to economic aggregates





Questions?

