



Modelling for a green economy

In recent years, global pressure points including climate change, food and water availability, price surges for metal ores and oil, and the financial crisis have converged in an unprecedented way.

The United Nations Environment Programme (UNEP) has pledged support for new approaches to investment through a Global Green New Deal and the Green Economy Initiative. These new policy initiatives require current decision making, which focuses on a few indicators (such as GDP, inflation rate and employment), to be broadened to include information on resource use (materials, energy and water), waste and emissions that underpin our current consumption and production systems.



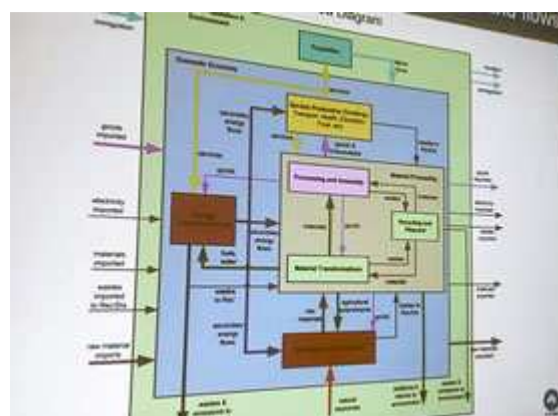
(L-r) Anna Stabrawa (UNEP), Heinz Schandl (CSIRO) and Graham Turner (CSIRO) in discussion
Courtesy of Stefanos Fotiou, UNEP

Heinz Schandl, Graham Turner and Karin Hosking of Ecosystem Sciences recently met with UNEP and the University of Western Sydney (UWS). They reviewed progress on integrated assessment for resource efficiency and systems innovation policies to enable a green economy.

The aim was to develop linkages between the Australian Stocks and Flows Framework (ASFF), a technology-based physical model of the economy, and the non-equilibrium financial stocks and flows model (MCT) that has been designed by Steve Keen at the UWS. ASFF analyses resource constraints and trade-offs between resources (such as energy and water) for different population, lifestyle and technology scenarios. While MCT addresses the cyclical behaviour of economic systems. Linking the two models helps create credible scenarios and allows policy alternatives to be tested.

UNEP realises that new economic concepts and modelling are needed in order to gain a more realistic picture of future resource use and limits that may be imposed on economic development, especially in Asian developing economies. Economic decisions in the past have often relied on

reductionist approaches, contributing to policy failure. In a changing economic context, where resource constraints and emissions are taken more seriously, new economic modelling will be instrumental to inform policies and design instruments to transform current production-consumption systems to increase sustainability. CSIRO is looking for new approaches that can deliver human and economic development and improved standards of living, while using fewer resources and producing fewer emissions.



The Asia-Pacific Stocks and Flows and Framework - a technology based physical representation of the regional economy of Asia and the Pacific.
Courtesy of Stefanos Fotiou, UNEP

The development of the ASFF and the proliferation of resource-use data over the past decade has created unique research opportunities in Australia and globally. MCT is the first multi-sector financial stocks and flow model that does not force equilibrium on the model and is therefore able to show economic cycles and breakdown in the financial system. By linking these two models, we are able to run more realistic future scenarios. This will help to inform policy making in a situation of urgency and uncertainty. There are only a handful of groups internationally attempting similar modelling efforts, which places CSIRO in a very competitive position in regard to policy advice.

This research is part of the Sustainable Cities and Coasts Theme, led by Allen Kearns, in the Climate Adaptation Flagship. It contributes to the fundamental understanding of resource use systems that underpin both adaptation and mitigation decisions.

Read more about our [Sustainable use of natural resources](#).



(L-r) Graham Turner (CSIRO), Heinz Schandl (CSIRO), Anna Stabrawa (UNEP), Steve Keen (UWS), Mike Honeychurch (UWS), and Stefanos Fotiou (UNEP)

Courtesy of Stefanos Fotiou, UNEP

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