

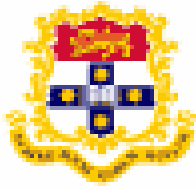
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A novel TBL initiative



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TBL without boundaries

With the introduction of the Financial Services Reform Act in 2001 and its implementation from March 2002, there exists the requirement to report on issues around Socially Responsible Investment (SRI) and the ways in which this can be reported and quantified.

Running parallel and ahead of these particular issues is the emergence of Triple Bottom Line outcomes where institutions and companies take a more active management stance not just on financial outcomes but also on the social and environmental outcomes that result from their position and actions in the market place. Companies can gain market advantage from good economic, social and environmental management, as well as developing an appropriate ethical position. This identifies the “ecologically sustainable development” movement, which after a decade of apparent hibernation has emerged more recently as the "triple bottom line" movement.

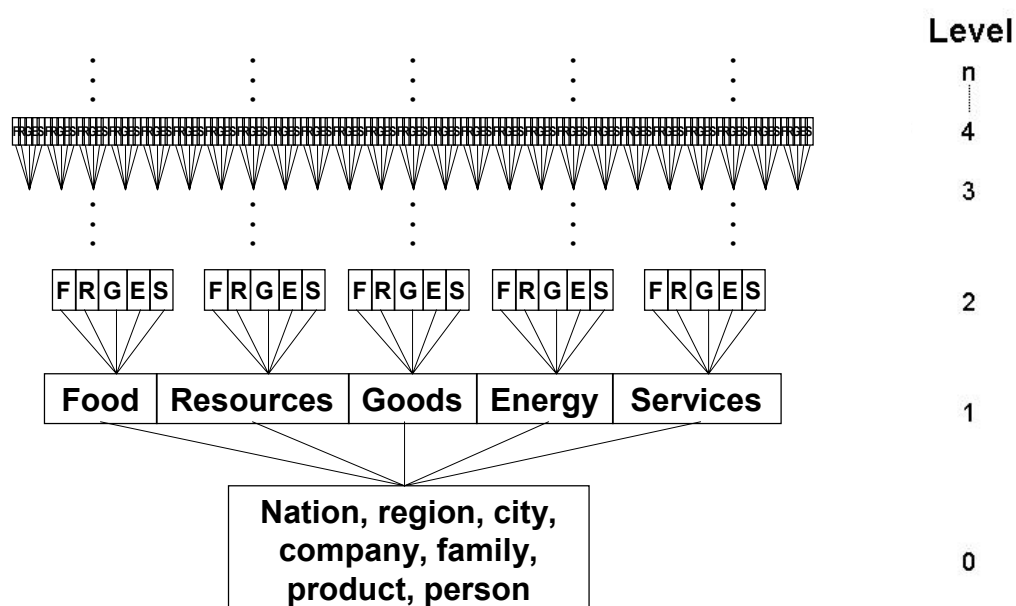
In line with the increasing requirement for accountability, continuous improvement, reporting and monitoring these "triple bottom line" and "socially responsible investment" areas must be turned from philosophical concepts to measures that can be quantified and reported in company reports. Indices of socially responsible investment are now regularly reported and a range of financial investment vehicles use a variety of data sources to screen companies for investment decisions. Many businesses are developing triple bottom line attitudes, and major companies are behind the Global Reporting Initiative (GRI) which is developing a protocol for companies to report on their economic, social and environmental outcomes.

While physical and social scientific research has helped to develop parts of these broad agendas, it has concentrated on particular issues in the quest for depth of understanding and might have been left behind by the breadth and speed of the triple bottom line movement. However there have been a number of scientific initiatives that have been developing broad understandings of how whole economic systems function and the degree to which environmental and social outcomes are almost predetermined by the structure and function of the economic sub-systems. One of these initiatives is a close collaboration of the University of Sydney with the CSIRO Resource Futures that has elaborated the structure and function of the Australian economy initially from an energy perspective, but then taking on issues such as water, employment, economic surplus and land disturbance. A team comprising researchers from both institutions has developed a whole-economy model that describes the functioning of the physical economy as a complement to the standard economic models that are central to the development of public policy issues in Australia. The team has developed a broad collaborative relationship over the last two years that sees their respective approaches and disciplinary backgrounds moulded together in order to implement triple bottom line accounting at a whole economy level.

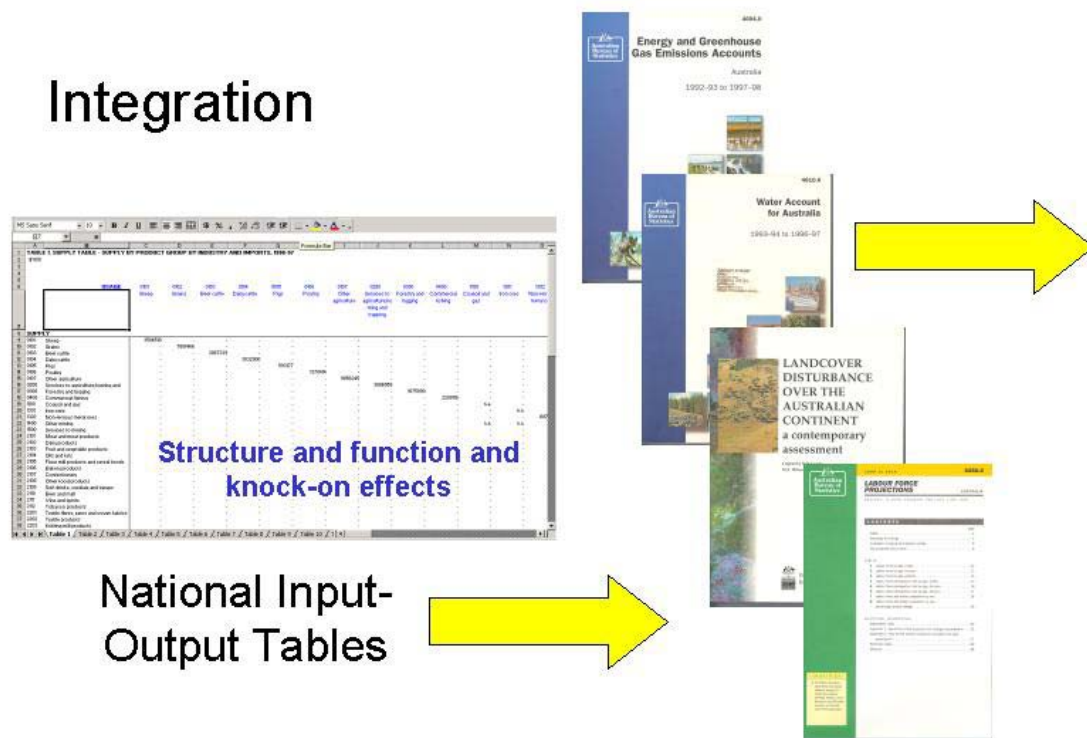
There are six key issues that define requirements of reporting for SRI and TBL issues, which are addressed in the work of the Sydney University / CSIRO team:

- The reporting methods must be reasonably simple in output terms and able to be understood and accepted by company management, investors, public policy and the public.
- They should produce indicators that are based on a common unit of understanding (a metric).
- They must be able to be used at a number of levels such as economic sectors, individual firms or government institutions.
- While reasonably simple, they must reflect the complexity of modern economic systems and be rigorous enough to meet economic challenge.
- They should be able to report the direct effects that exist in the immediate requirements of a particular sector or company, as well as indirect effects that account for the range of goods or services obtained from other sectors or companies.
- They should provide a stimulus to management change and innovation if the particular sector or company report details a number of issues that are at odds with economy wide expectations or norms.

These problems are addressed by taking a TBL reporting approach that is based on a concept of *embodied energy analysis* first developed by energy researchers in the early 1970s during the first oil crisis. Simply put, it uses the structure and function of the economic system as described in the national input-output tables to derive the energy pathways and energy dependence of the whole set of economic sub-systems (or sectors) that make up the economy. This structure is best depicted as an ever-expanding “tree of dependence” that contains chain of linkages from a particular sector or institution to a wide range of upstream sectors. Thus a particular requirement for a good or a service can cascade from one or two suppliers at the first layer of dependence into thousands of suppliers (see figure).



Input-output tables were first developed by Noble Prize winning economist Wassily Leontief in the 1940s to help improve the American war effort. It was always Leontief's intention that input-output tables be extended from purely financial considerations to a range of social aspects and resource quantities. Thus the methods we use entail integrating the structure and function of the financial economy (as described by the national input-output tables) with other national social and physical accounts such as employment, energy, greenhouse emissions, water and land disturbance (see figure).



By including indirect effects, the Sydney University / CSIRO research group is able to describe in hard numbers a number of economic, social and environmental outcomes against a common unit of one dollar of GDP. The latter constitutes a convenient and meaningful numeraire because, as Adam Smith concluded already in 1776, it is "the sole end and purpose of all production". Thus economic entities of surplus, exports and imports can be reported as "dollars of surplus per dollar of GDP". Social entities such as employment, wages and government revenue can be described as "the minutes of employment generated per dollar of GDP". Environmental entities such as greenhouse gas emissions, water requirement and land disturbance can be described as "kilograms of carbon dioxide emissions per dollar of GDP". Because these quantities have the common metric of one dollar of GDP, they can be applied to the financial balance sheets of companies and institutions and thus allow triple bottom line reporting at the company level that is commensurate with sectoral, regional and national reporting.

In contrast, a reporting approach that does *not* take into account indirect effects can lead to inconsistencies and loopholes, for example in the following cases:

- 1) *Size and structure of a company*: Assume an Australian dairy company “A” that owns the entire production chain, i.e. production of raw milk at the farm, transport logistics from farm to factory and the manufacturing site. This company has significant water usage (mainly at the farm). Assume that the same company “A” demerges into two companies “A1” and “A”, or outsources to a company “A1”, with A1 consisting of the farm and transport logistics, while the “new A” is responsible only for dairy manufacturing. In a conventional (on-site only – no upstream impacts) TBL reporting regime, “A” can improve its TBL (water) performance artificially but significantly, despite the fact that the supply chain – and hence the impact of the product “processed milk” – is exactly the same.
- 2) *Green supply chain*: A manufacturing company “B” uses large quantities of packaging materials for their yogurt. The packaging material consists of HDPE and aluminium. Both materials are energy-, greenhouse-gas- and water-intensive. The management of the company decides to replace the packaging material with starch-strengthened biodegradable plastic that is less energy, greenhouse- and water intense. Under conventional (“on-site-only”) TBL rules B is not rewarded for this shift to a more sustainable packaging. However, by incorporating indirect effects the improved environment performance can be quantified.
- 3) *Risk and liability*: A manager of an ethical fund assesses the risk that is posed to a construction company “C” and a water supplier “D” when faced with a carbon tax. The manager decides to incorporate C into the ethical portfolio, because C’s carbon emissions from on-site construction machinery are lower than D’s emissions from water treatment processes. However, C may face much higher additional, indirect risks than D, which arise out of price increases of carbon-intensive inputs such as aluminium frames and cement. These risks are ignored in current TBL approaches.

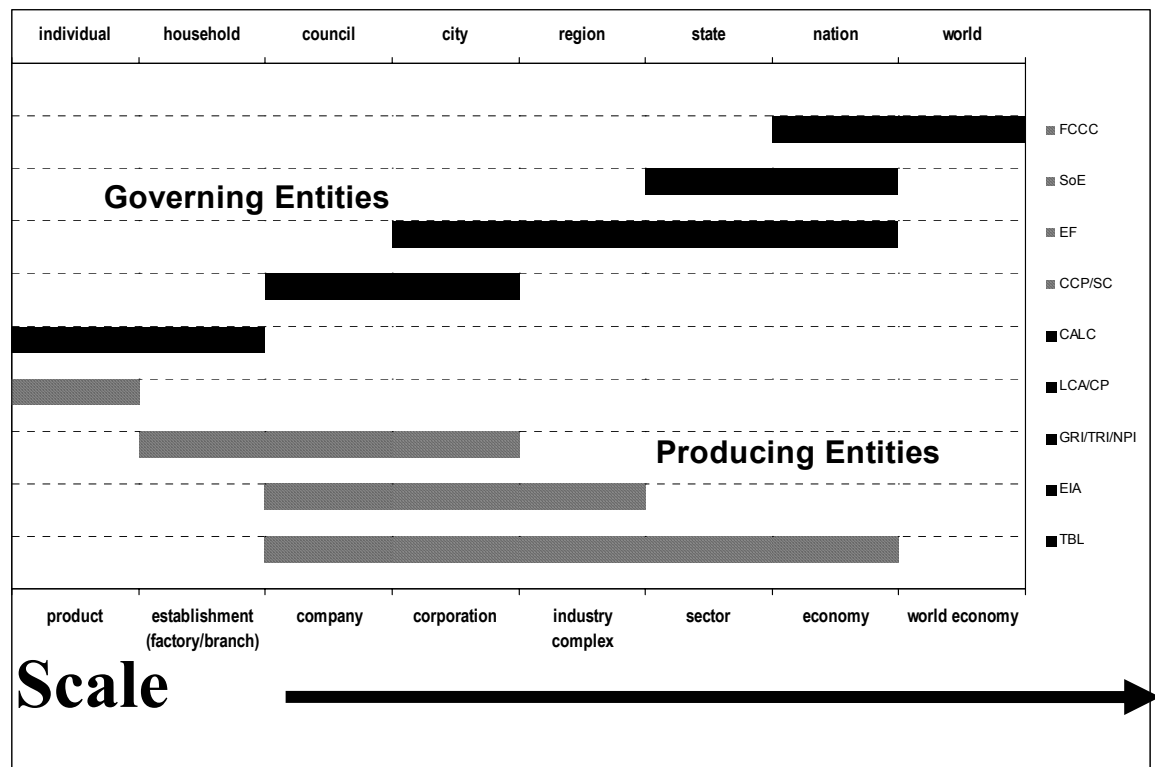
It is most important that a TBL framework is in line with international developments. The most obvious work to note is the Global Reporting Initiative (GRI 2002) developed under the auspices of nearly 20 agencies including the World Business Council for Sustainable Development, the United Nations Environment Program and the World Resources Institute. The Greenhouse Gas Protocol is a similar development also being undertaken by these institutions. While direct impacts are at the core of these approaches, there is limited specific accommodation of indirect impacts (usually termed wider impacts).

- Direct effects concerning the TBL of companies, are well handled by the GRI approach. Indeed, a specific, bottom-up analysis is required to adequately address companies to account for such aspects as technology differences, non-standard practices, joint ownership of operations and assets, etc.
- The accurate assessment of indirect effects of companies, can only be accomplished with the holistic, top-down approach developed by Sydney University / CSIRO. This area is where the meaning and the results of the GRI can be extensively enhanced. It is simply not possible for the GRI’s bottom-up approach to capture all the indirect effects and to deal with boundary problems in a transparent way.
- For economy-wide or sector’s TBL accounts, direct and indirect effects can only be enumerated by the top-down approach.

The reporting and assessment framework that the Sydney University / CSIRO team proposes therefore has the potential to touch every corner of the modern economy.

Outlook

The methodological advances of TBL and the application to a large company described in the previous two parts are two examples of a wide range of sustainability reporting initiatives portrayed as an integrated schema shown in the figure below. Already there are a many methods used to provide analyses and indicators for consumers and the entities that seek to guide or understand that consumption. At higher levels of integration, global initiatives such as the *Framework Convention on Climate Change* first seek to enumerate and then modify the amount and type of fossil fuel combustion eventually at a global level through nation specific activities (see top right hand part of the figure). At slightly smaller scales of nations and regions within them, *State of Environment Reporting* provides indicators of human impact and hierarchies of policy actions that might be required to contain or redress negative impacts. Bridging a range of spatial scales are spatial indicators such as the *ecological footprint* which document total and per capita impacts of settlements and products. For cities and the institutions that manage them, there are a number of initiatives such as *Cities for Climate Protection* and the *Solar Cities* activities. At the basic node of consumption, the individual and the household, there are many *calculators*, most of them web based, which interpret lifestyle and consumption issues in terms of the energy, water and land required to deliver the good or service to the customers satisfaction.



Conceptual diagram of the scale of the enterprise (producing or governing entities) against the method and philosophy of environmental assessment and monitoring. (Acronyms as follows: CALC = Personal calculators and scorecards; CCP = Cities for Climate Protection; CP = Cleaner Production/Ecodesign; EF = Ecological Footprint; EIA = Environmental Impact Assessment; FCCC = Framework Convention on Climate Change; GRI = Global Reporting Initiative; LCA = Life-Cycle Assessment; NPI = National Pollutant Inventory; SC = Solar Cities; SoE = State-of-Environment Reporting; TBL = Triple-Bottom-Line Accounting; TRI = Toxic Release Inventory.)

For producing entities there are a similar range of analytical approaches covering scales appropriate to production activities (see bottom half of the figure). Initiatives such as *triple bottom line* reporting, sparked by John Elkington potentially cover scales from a national economy down to an individual company. *Environmental impact assessments* typically cover new developments from the scale of an integrated industrial complex down to an individual company. The *Global Reporting Initiative* (GRI, 2002), *Toxic Release Inventories*, and *National Pollution Inventories*, are focused on corporations and companies but may also apply to an individual factory or site. Products are assessed with *life cycle analysis*, *cleaner production* and *eco-design* protocols.

Thus there seem to be sufficient analytical methods and institutional buy-in to ensure that the full range of governing/consuming entities as well as producing entities are covered in a management and monitoring sense. However even the relatively sparse review of methods versus scales shown in the figure above will suggest the possibility of overlap and logjams in data collection and reconciliation. This could result in eventual apathy by both producing and governing entities as the system becomes too complex to spark effective responses to issues.

This paper proposes that a seamless set of linkages across scales, method and institutions can be effected by using the internationally accepted 'System of National Accounts 1993' as the unifying theme of integration. By using the data standards that apply to most developed economies, the input-out tables that quantify inter-relations between sectors and the indicators for 'triple bottom line' developed at economic sector level, then issues such as sustainable chain management become integrated with most other reporting initiatives, and most importantly are grounded in the same data underpinnings. This approach ensures that analyses are conducted within a suitable system boundary, that double counting issues are minimised and that where production chains have to be re-designed, then flow-on effects to upstream and downstream sectors can be assessed.

References

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