Centre for ISA Information Sheet 2
Boundary issues and the full supply chain

The *boundary* within which an organisation accounts for its environmental, social and/or economic effects is usually defined as that over which the company has direct influence and can exercise control. In relation to this:

> "[I]t is critical [that] the boundaries adopted for the purposes of reporting are clearly defined and obvious to readers of reports. Careful boundary definition also ensures a report can be verified and meaningful comparisons can be made between information from different reporting periods." [1]

The 'careful boundary definition' quoted above faces a number of challenges. The level of influence and control will vary from organisation to organisation and from year to year, invalidating comparisons within and between organisations. Moreover, extending the boundary beyond the immediate control of the organisation still begs the question of exactly where to draw the line. Decisions will differ between organisations and over time. Establishing a clear boundary for an analysis that is consistent across all indicators seems at first sight to be almost impossible. Notwithstanding these challenges, the boundary problem can be solved by taking a full life-cycle perspective.

A huge number of upstream suppliers feed into any organisation (see Figure 1 below). Each one of them has Triple Bottom Line impacts to be accounted for. Most audit approaches, such as that taken by the Global Reporting Initiative (GRI), are not designed to extend much beyond the first level of suppliers. Whilst important local or on-site effects are captured by the GRI audit, the considerable economy-wide effects that the organisation is part of, are not accounted for or reported on. The same is true for downstream impacts, which are only partly accounted for in audit-type approaches (e.g. GRI Indicator EN18).

The Global Reporting Initiative (GRI) is aware of the importance of the boundary problem. Its Boundaries Working Group has developed a Boundary Technical Protocol which is based on the key concepts of control and influence[2]. It provides principles and a process for setting boundaries while recognising the complex issues involved, including the problems of comparability and consistency mentioned above. The CSIRO/ University of Sydney team was active in the GRI's development of this protocol[3]. The ISA methodology solves the boundary issue by accounting for impacts of the full upstream supply chain[4].

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1 Environment Australia (2003), Triple bottom line reporting in Australia: a guide to reporting against environmental indicators, June 2003, page 8, also contains a wider discussion about the issue of boundaries. http://www.deh.gov.au/settlements/industry/finance/publications/indicators/index.html

2 GRI Boundary Technical Protocol July, 2005. For Report Guidance for Boundary Setting see http://www.globalreporting.org/ReportingFramework/G3Online/SettingReportBoundary

3 Dey, Lenzen, Foran and Bilek (2002), Addressing boundary issues in the Global Reporting Initiative: comments on the Draft 2002 Sustainability Reporting Guidelines.

4 B. Gallego and M. Lenzen (2005), A consistent formulation of shared producer and consumer responsibility, *Economic Systems Research 17 (4)*, 365–391,.

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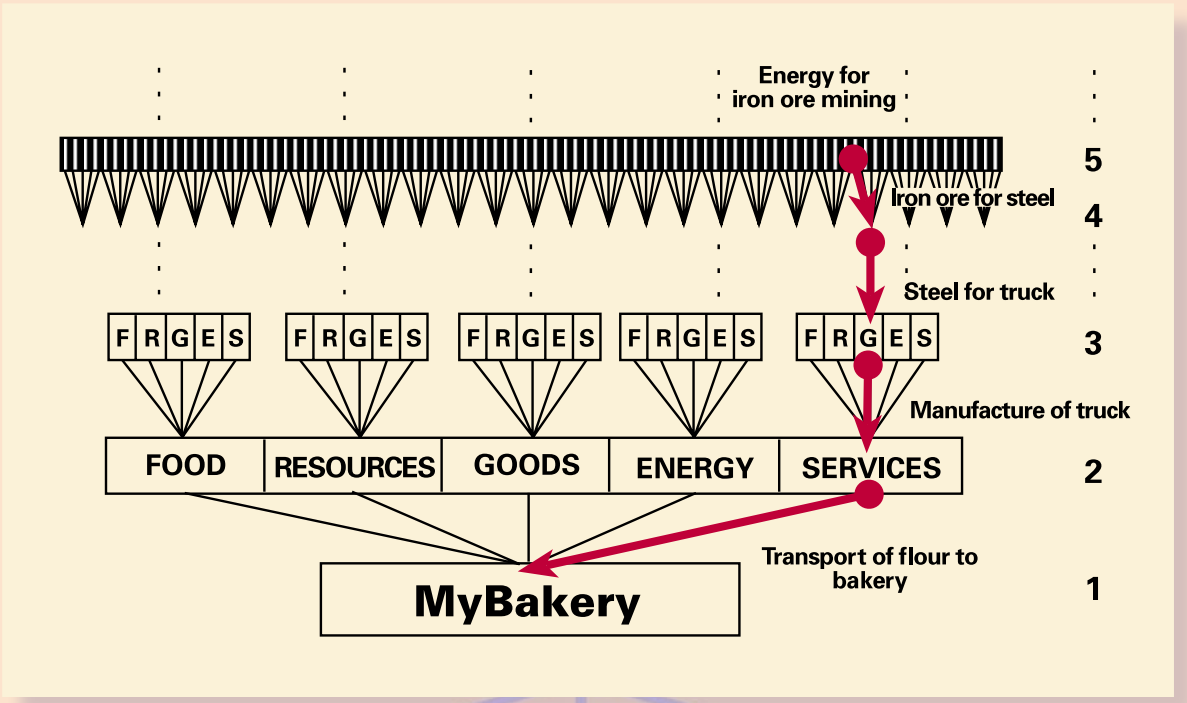
Figure 1: Upstream suppliers and the issue of boundaries



Imagine MyBakery at the foot of a tree that represents MyBakery's supply chain. The first "canopy" up from the foot is MyBakery's suppliers. The next canopy up is the suppliers of MyBakery's suppliers, and so on. This tree is an infinite tree of suppliers. The foot is called *production layer 1*, the first canopy is labelled '2', the second '3', and so on.

Impacts occur in every production layer. Take the indicator 'energy' for example. MyBakery is connected to town gas to fire its ovens. The gas used on-site belongs into production layer 1. MyBakery buys flour. This flour needs to be produced by a flour mill. The energy used in the flour mill belongs into production layer 2, since the flour mill is a direct supplier of MyBakery. The flour also needs to be delivered to MyBakery by a transport firm. The diesel used by the truck also belongs into production layer 2, since the truck company supplies the transport service to MyBakery. The truck that the transport firm uses needs to be assembled by a vehicle manufacturer. The energy used during this assembly process belongs into production layer 3, since the vehicle manufacturer is a supplier of the transport firm which in turn supplies MyBakery. And so on.

The chain of red arrows in the supply chain tree is called a *structural path*. There are millions and millions of structural paths in a typical supply chain tree. This is because the economy is so complex. The complexity of the calculations can be appreciated when you consider that in the ISA model of the Australian economy

- production layer number 2 has 344 members, who each have 344 suppliers, so that
- production layer number 3 has 118,336 "suppliers of suppliers",
- production layer number 4 has over 4 million "suppliers of suppliers of suppliers",

and so on. ISA methodology accounts for the effects of *all* suppliers.