Constructing a time-series of physical input-output tables for Australia using RAS

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Author: Jacob FRY
Co-Authors: James West, Manfred LENZEN, Timothy M Baynes

A large proportion of physical material flows in the Australian economy involve the construction industry. However unfortunately, there is currently no complete account of these physical flows for Australia. This hinders environmental impact analysis and makes assessing progress towards the `circular economy' difficult. If the magnitude and composition of these material flows was known, future resource requirements for building stock growth could be predicted. In addition, the availability of waste products from the dismantling of building stocks for use as inputs to new structures could be estimated. The capability of existing domestic recycling infrastructure to recover these wastes, as well as the existence of markets for recycled products, could also be assessed. Producing an account that maps these physical flows can be difficult since generally physical data describing the economy is less detailed than monetary data. In addition, physical production data is both limited in the number of products covered and to economy-wide totals, and industry-level consumption information typically does not exist. In this study, we construct a time-series of physical input-output tables (PIOTs) for Australia that contain high-detail for the construction industries from 1985 to 2012. A RAS procedure is implemented to leverage all available physical data and to impose conservation of mass on the system. A variety of constraint types are used, including point, summation, ratio and balancing constraints. These are the first physical IO tables to be constructed for Austalia to the authors' knowledge and have a resolution of 130 products/industries. The usefulness of these tables is demonstrated by the tracing of waste products back into new production.