

ENVIRONMENTAL-ECONOMIC IMPACT ANALYSIS TOOLKIT (EEIAT)

Research Question

The fundamental question of the research is how to assess effects of Australian economic activities and environmental policies on waste flow.

Which type of technology can be applied to assess the effects accurately and precisely?

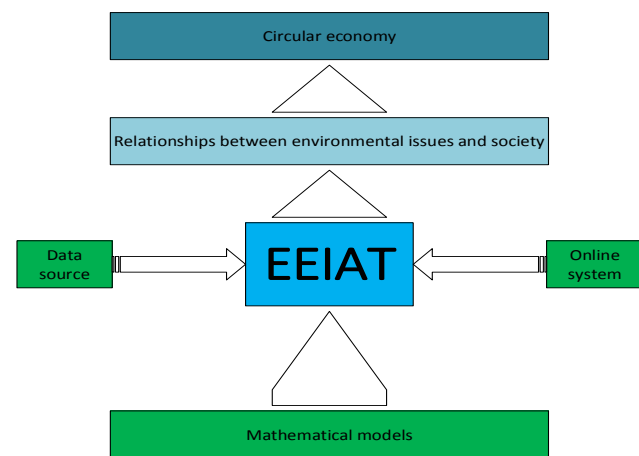


Figure 1: Basic framework of EEIAT.

Methodology

EEIAT is an assembly of online analysis tool based on an environmental input-output (EIO) model for Local Government Areas across the nation. The tool currently provides a standard approach for estimating the effects of Australian economic activities (e.g. the growth of Gross domestic product (GDP) in the Construction sector) on waste management. And the tool also offers information regarding the effectiveness of the impact of environmental policies on regional development.

Results

The first finding is the foundation of waste footprint, which quantitatively describes waste generation and

treatment in the Australian economic system. The waste footprint makes the origins and destinations of 12 types of waste easily identified.

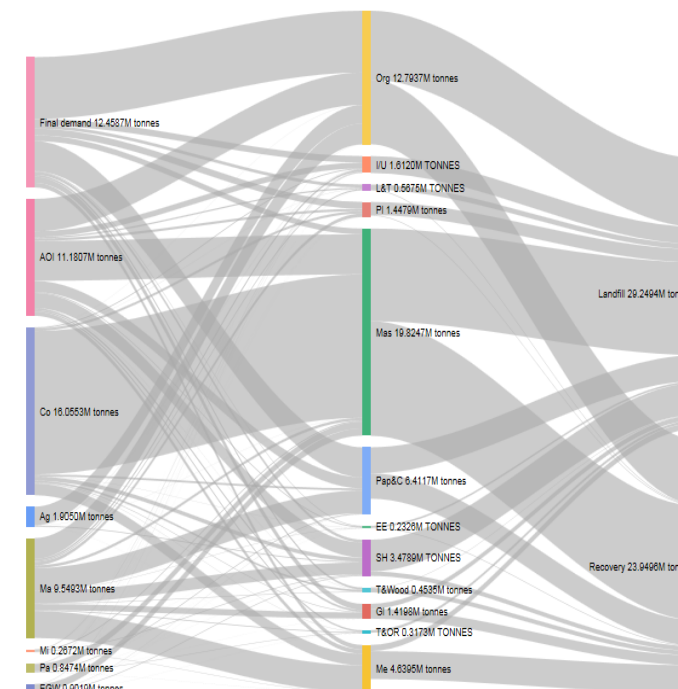


Figure 2: Australian waste footprint in 2009-10.

The second finding is to identify the major drivers of waste generation with the development of Australian economy based on structural decomposition analysis (SDA). The level effect of Final demand plays the most important role on waste generation during the period. Although the application of more ecological technologies has led to the decrease of waste generation, it cannot diminish the growth of waste generation caused by the Final demand. Therefore, in order to lower waste generation and lessen environmental burden, it is not enough only to consider the application of the new technologies, but pay more attention on how to reduce the demand of the society.

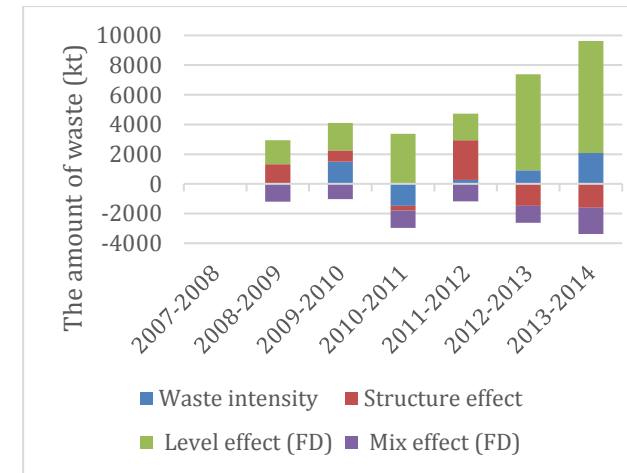


Figure 3: Cumulative SDA of changes of Australian waste generation from 2007-08 to 2013-14.

The third finding is to construct a closed waste supply-use table to assess the effect of the Household sector as an “endogenous” factor on waste flow. It indicates that Australian waste policies should focus more on the supply chain of goods and services consumed by household consumption rather than only focusing only on on-site waste collection.

Table 1: A closed waste supply-use table (CWSUT)

	Intermediate demand sectors		Waste treatment sectors		Waste types	Final demand	Gross output
	1...N _i	Household 1	1...N _j	Import 1			
Intermediate sectors supply	1...N _i	T ₁₁ (\$)	T ₁₂ (\$)	T ₁₃ (\$)		f (\$)	x ₁ (\$)
Income 1		T ₂₁ (\$)		T ₂₃ (\$)			x ₂ (\$)
Waste treatment sectors	1...N _j				W ₁₅ (t)		x ₃ (t)
Export 1					W ₁₆ (t)		x ₄ (t)
Waste types	1...N _j	W ₅₁ (t)	W ₅₂ (t)	W ₅₃ (t)	W ₅₄ (t)	W ₇ (t)	x ₅ (t)

Conclusions

EEIAT has a comprehensive view of the dynamic analysis between the economic activities and waste flow to illustrate if the current Australian economy moves towards a circular economy. It also provides guidance on the impacts of different industrial sectors and services with respect to waste management.

Anticipated impacts

This research aims at developing the EEIAT to offer knowledge of sources and drivers of waste generation for policy-makers (such as Green Industry SA) to design waste strategies effectively and accurately.

Future research

The scope of EEIAT can be extended to deal with other environmental issues (such as energy consumption and carbon dioxide emissions). It also can conduct a comparative analysis of different territories’ waste management in Australia.

The combination of Life cycle analysis and EIO model will become a leading research to analyse impacts of different types of products, materials, services, or industries with respect to resource use and emissions in the Australian economy.

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