



Analysing (In)efficiencies in the use of Raw Materials and Underlying Drivers – What are Existing Knowledge Gaps and Research Needs?

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ABSTRACT

Current projections of population growth and income indicate that we run a high risk of causing irreversible damage to the planet's natural environment and thus also its ability to provide sufficient resources for us all. This is why the concept of absolute decoupling is so important – it aims to break the link between economic prosperity and associated resource use and environmental impacts. To achieve absolute decoupling, we must use resources more efficiently. This requires diverse strategies, such as sustainable resource extraction or shifting to more sustainable consumption and production patterns. But what are the areas where resource efficiency has most potential to achieve absolute decoupling?

In order to answer this question,

1. We first conducted an extensive literature review and material flow analyses for selected resources to identify the main areas of resource use that can currently be deemed inefficient and to highlight the magnitude of some inefficient uses.
2. Secondly, we undertook a meta-analysis of scientific articles to identify and synthesize relevant drivers as this knowledge appears fragmented.

In general there seems to be significant potential to increase resource efficiency across all resources and sectors considered. However, the potentials identified are often theoretical (technical) estimates that seldom consider whether to realise them would be economically feasible and socially acceptable. In order to achieve absolute decoupling, research is therefore needed to inform us on:

- What are (economically and socially) optimal investments to be made in resource efficiency and how should we prioritise them?
- How should we address inefficiencies related to use and consumption behaviours such as choice of diets, use of products and overconsumption? Here, preferences and the question of 'sufficiency' need to be addressed.
- What are promising pathways to achieve global resource use that remains within resource limits and sustainability thresholds?

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