Improving industrial efficiency across the supply chain

Using resources more efficiently reduces the impact of industry on the environment. A new study suggests it could be better to tackle efficiency across supply chains rather than at the level of the individual manufacturer.

Resource efficiency can be defined as the percentage of purchased raw materials to finished product. It tends to be measured in terms of what an individual manufacturer consumes, but if the figures are added up along the supply chain, then the cumulative inefficiency may be greater. For example, if each company in a supply chain of four companies has a resource efficiency of 75 per cent, it follows that the overall efficiency of the chain is around just 30 per cent, i.e. around one third of the material inputs to the first company is expected to leave the fourth company as finished goods.

This study presents results from a programme in the Australian state of Victoria to help businesses reduce their environmental impacts by engaging with supply chain partners.

Two timber furniture manufacturers participated in the project. A supply chain map and audit indicated that one was more efficient than the other. In the less efficient chain there was a duplication of a coating process, due to a lack of communication to suppliers about customer needs. This duplication was eliminated and produced a 4 per cent increase in material efficiency, which equated to a saving of 6.5 m$^3$ per 100 m$^3$ of wood.

The study also examined recycling opportunities for shavings, short timber lengths and wood with defects. The manufacturers formed partnerships with a timber recycler and for one manufacturer recycling increased from 43 to 71 per cent, with an annual cost saving of AU $40,000 (€23,000). Selecting optimal timber lengths was also identified as a means of improving efficiency.

Two food distribution chains of frozen and tinned goods also participated in the project. These were selected because they had the largest potential to reduce product damage and loss through the supply chain. Once a food product is damaged it is usually sent to landfill, reducing efficiency.

The supply chain audit located several sources of product damage. These included incorrect stacking of pallets and poor handling by forklift trucks. Improved understanding of the science behind types of packaging such as slip sheeting and the need for correct stacking resulted in a reduction in product loss of about 10 tonnes on a single product line. Forklifts were also modified to minimise loading/unloading damage. The programme also helped better communication of acceptable quality standards throughout the chain.

The study demonstrated efficiency gains in all four supply chains and savings to the manufacturers. While the research was on specific types of manufacturer, the results indicate that effective communication of quality standards throughout the supply chain is an important step to improving efficiency for all types of industry.


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