Potential for efficient use of materials to boost employment levels

A new study has estimated the future employment impacts of five innovations that use materials more efficiently. The results indicate there could be small overall increases in employment levels in all cases, however, this may require substantial structural changes in different economic sectors.

The post-Lisbon goals have highlighted the importance of analysing the economic impacts of policies that encourage environmental innovations. The research analysed five cases of increasing efficiency of material use in Germany and the effects on employment up until the year 2020.

Efficiency increases may cause a drop in employment for sectors that source and produce basic materials, as better efficiency requires less material. However, there may be increased employment in sectors that increase the efficient use of materials, such as companies involved in recycling or producing resource-efficient technologies. The analysis combined modelling results with technological forecasts, expert interviews and scenario analyses to estimate impacts of material efficiency on the economy.

The five case studies were: the sustainable production and use of paper, recycling plastics, prolonging the life span of cars, car sharing and the production of bio-based products, such as oil and textiles made from natural ingredients, including soybeans, flax and jute.

In all case studies, there was a fall in employment in basic material sectors. For example, the sustainable production and use of paper applies various strategies, such as recycling, printing on demand and substituting paper use by increased email communication. Assuming a 10 per cent reduction of paper use, this would have a combined decrease in employment of 40,000 in sectors that produce pulp and paper and in transport sectors. However, there will be an accompanying increase of around 60,000 in employment in sectors, such as collecting paper for recycling, printing on demand and communications technology. This could potentially lead to an overall increase in employment of 27,000 if the development of these ‘new’ sectors were achievable within Germany.

Similarly, if more plastics are recycled, employment will drop primarily in the plastic production and waste incineration sectors, but this will be counterbalanced by increases in employment in companies that recycle plastics or transport them to recycling plants. The study estimated an overall increase in employment of 2000. Both prolonging the life span of cars and car sharing led to decreases in employment in the car manufacture sector, but possible gains in other sectors, such as car repair and maintenance and industries to organise car-sharing. The estimated increases in total employment from these innovations were 13,000-16,000 each.

Lastly, a rise in the use of bio-based products is likely to reduce employment in industries that make equivalent products from traditional materials, such as the petrochemical industry. However, employment in agriculture and new process technology could see positive effects leading to an estimated total increase in employment of about 1000.

Overall, service-orientated sectors tend to benefit. Service sectors tend to be labour intensive and domestically based to a greater degree, which results in small increases in total employment. However, in all case studies there is an assumption that the frameworks are in place to support these shifts of employment to different sectors. In addition, the research tends to assume that gains would occur within Germany, when in reality, services such as recycling, could occur abroad.


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