

Climate Change Scenarios 2050 – Challenges for the Waste Management Sector

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By 2050, the industrialized countries will have to achieve a reduction of GHG emissions up to 80 – 85% referring to 1990. This target range will also have impact on carbon going into material use. Actually, material consumption of carbon has already reached a similar level as its use as energy source, and will gain more importance. In Germany, about 250 million Mg of carbon have been utilized for energy purposes and 228 million Mg for material use in 2000. Material use is dominated by the agricultural sector (assimilation of atmospheric carbon), followed by manufacturing industries and wastes. So the previous focusing of climate balances on the energy and industry sectors has to be reconsidered.

For future scenarios, the non-energetic use of carbon should be taken into better account because it leads to a continuously growing carbon pool in the technosphere. Carbon materials are used for e.g. thermal insulation, plastics substitute metals e.g. in car industry, increasing amounts of building materials are made of organic materials, mainly of fossil origin, all forming at present a growing carbon pool. At the end of product life, in 20 or 30 years, this carbon will end up in the waste sector. Using today's treatment and disposal techniques, it will be released as CO₂ emissions to atmosphere, and this will lead to an increase in CO₂ emissions. In 2050, a 95% scenario of today's waste management would be sufficient to miss the reduction objective mentioned above. So the new task is to manage these materials without considerable CO₂ emissions. Actual questions are:

- Does climate change policy in 2050 in the western industrialized countries stand or fall with overcoming waste incineration?
- Can we imagine a year 2050, when MSWI plants perform input controls because the combustion of fossil share is limited to say 10% of all carbon burnt at a monthly average?
- Can, under these considerations, landfilling experience a revival, as a carbon sink?

If in this scenario landfills are still closed for combustible wastes, material recycling would be the winner. Fossil carbon shows no climate impact as long as it is kept in the material cycle. The most important measures to reduce greenhouse gas emissions will then be to extend the entire service life and increase the recycling rate of plastic products. And material recycling will then be performed technically more advanced than today because there exists an economic basis for it. Then waste management will be „in line“ with climate protection. Can such a scenario work technically and economically?

In the future, the waste sector, or perhaps the resource management of carbon material flows, will turn out to be a core area in the chemical sector to achieve climate protection goals. The discussion of sector goals will come, so the waste management sector should be prepared, because it will be included in this discussion, especially if its impact on climate protection becomes more aware in broader political public life. For this discussion, a better understanding of today's carbon cycles, especially the material use, is needed as basis. Already today, strategic thinking about the significance of managing carbon streams and the potential of waste management and its innovative actors is necessary to meet the future challenges.