

Waste management

Henning Wilts, Wuppertal Institute for Climate, Environment and Energy, Germany

Although waste management has always been described as a key sector for sustainable management, over the last decades research has focused more or less on technical aspects of waste treatment. Only recently the fascinating complexity of waste – the political economics of waste infrastructures or the social aspects of waste generation – started to raise attention and demand new, interdisciplinary research approaches. The following wants to highlight the magnitude of change waste management is undergoing, the expectations related to these developments and the often still sad reality of waste management. It ends with a very preliminary idea of closed material loops on multiple scales – looking at waste as a resource, not an environmental threat.

Towards a “circular economy”?

Waste management is undergoing a fundamental transition process: historically, waste infrastructures have been established in order to ensure the disposal of waste in a cheap and reliable way. Traditionally, waste has been seen as a potential threat to human health and it was regarded as a public task to take care of it – by landfilling it outside of the city walls, or in later times by burning it in waste incineration plants (the first ones established in Germany and the UK after the last outbreaks of cholera in urban agglomerations). This socio-technical regime of waste disposal with all its technical infrastructures, governance structures and behaviour patterns was and still is focused on this purpose: to prevent society from drowning in waste. In the public opinion, large-scale systems based on municipal waste collection schemes and end-of-pipe technologies like waste incineration, shredding or other volume-reducing waste treatment procedures seem to have completely minimized these sorrows – in most developed countries and especially in the EU, waste seemed to be a “solved problem”.

Only recently has this perception has been contested, and the idea of a circular economy has raised increasing interest in the public debate, e.g. in the European Commission’s Communication on Zero Waste: “Since the industrial revolution, our economies have developed a ‘take-make-consume and dispose’ pattern of growth – a linear model based on the assumption that resources are abundant, available, easy to source and cheap to dispose of. It is increasingly being understood that this threatens the competitiveness of Europe.” (European Commission 2014)

High expectations...

The roots of circular economy go back to the 1970s and are based on the principles put forward by many thinkers and business innovators, including Walter Stahel and his conceptualisation of the performance economy (Stahel 1976), John Lyle and his work on regenerative design (John T. Lyle) or the cradle to cradle models of Michael Braungart. Nevertheless, the narrative of a circular economy is increasingly gaining the support of business and enjoys increasing recognition from policy makers worldwide.

The expectations linked to this aspired transition from securing disposal towards a sustainable resource management in a circular economy could not be higher – especially in Europe: “Moving to more circular economic models promises a much brighter future for the European economy. It would allow Europe to rise to the current and future challenges of global pressure on resources and rising insecurity of supply. Pumping resources back into productive use again and

again, cutting waste and reducing dependence on uncertain supplies is a direct route to improving resilience and competitiveness. By helping to decouple economic growth from resource use and its impacts, it offers the prospect of sustainable growth that will last.” In addition, circularity is also expected to have a significant impact on innovation, employment, and capital productivity. In its reports “Towards the Circular Economy”, the Ellen MacArthur Foundation estimates an annual net material cost saving potential of a rapid scale-up of circular business models up to USD 630 billion (EMF 2012).

Disappointing reality

But although the public debate seems to focus on zero waste, design for recycling and closed material loops, the discourse shows a significant disparity between rhetoric and actual concepts of how to initiate, steer or support this transition. Obvious trade-offs between waste prevention as top of the waste hierarchy and job creation in the recycling sector as one of the identified green lead markets are neglected, waste infrastructure planning is still focused on regional autarchy – based on a polluter pays principle and not on the perception of waste as a resource. But especially indicators and targets that clearly set incentives for R&D and innovation patterns in the waste sector still refer to waste as something to be disposed of and not to a potential secondary resource. Despite all the on-going initiatives to transform Europe into a “recycling society”, the reality still shows a clearly different picture. In 2011, total waste production in the EU amounted to approximately 2.5 billion tons. But only a limited share (40%) of the municipal waste generated in the Union was recycled, with the rest being landfilled (37%) or incinerated (23%), of which around 500 million tons could have been otherwise recycled or reused (EEA 2013).

A global view on waste

A review of the reality of increasing waste shipments shows that waste is no longer just transported to the next waste processing facility where it is disposed of in an environmentally sound way. According to the Trade Council of the International Recycling Association (BIR), 68% of the global steel production is based in Asia; at the same time, about 60% of the steel waste is generated in the US, South America and Europe. Therefore, any attempt to increase the share of recycled steel needs to take into account the necessity of global waste exports. It becomes increasingly clear that from the perspective of a sustainable resource management, municipal and national waste policies have reached the limits of their capabilities.

While waste is seen less and less as an environmental burden, and more as a possible source for the production of secondary raw materials, the goal can no longer be to keep it within strictly limited disposal areas. Therefore the scope of future waste infrastructure planning has to be broadened and needs to take into account the resource efficiency potentials of recycling and closed material loops at different spatial scales depending on the value and mass flows: spatially short-cut for high volume flows with low value (e.g. construction waste), longer transport ways, and even internationally for high value flows.

References

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