

# WASTE INCINERATION AND WASTE PREVENTION: NOT A CONTRADICTION IN TERMS



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## Preface

Recently, various press reports on waste management in Germany have drawn attention to a supposed contradiction between waste incineration and waste prevention. The main claim was that the current expansion of waste incineration in Germany would thwart further efforts at waste prevention and block further advances in recycling and waste management.

The present paper by the German Federal Environment Agency (Umweltbundesamt, UBA) provides a detailed analysis of the current situation and 10 arguments on this issue. It seeks to clarify the facts and put the discussion on a more factual basis.

## Waste incineration - a contribution to climate protection

Waste incineration not only serves the purpose of safely disposing of waste, it also makes considerable amounts of energy available in the form of electricity and heat. In 2005/2006, German waste incineration plants provided some 6 terawatt hours (TWh) of electricity and 17 TWh of heat, equivalent to the supply required by a major city like Berlin. This energy can replace fossil energy sources such as coal or oil and prevent about 9.75 million tonnes of carbon dioxide emissions annually. About 50 percent of the energy contained in residual municipal waste comes from biogenic waste, which can be credited as climate-neutral. After deduction of the climate-relevant CO<sub>2</sub> emissions from the fossil waste fraction and the fossil energy purchased from external sources, the remaining net reduction in annual CO<sub>2</sub> emissions amounts to slightly less than 4 million tonnes of CO<sub>2</sub>. This is equivalent to the annual CO<sub>2</sub> emissions of some 1.6 million passenger cars.

This means that waste incineration is making a contribution to climate protection and helps save natural resources. In order to tap waste incineration's remaining CO<sub>2</sub> emissions reduction potential, additional financial, planning-related and regulatory instruments are needed. According to a study conducted in 2005 by the Öko-Institut on behalf of the UBA (UFOPLAN project no. 205 33 314), waste incineration could achieve potential savings in CO<sub>2</sub> emissions of up to 3 million tonnes, mainly by becoming more energy-efficient.

Some press reports claim that the current expansion of waste incineration in Germany is thwarting further efforts at waste prevention. In support of this claim, their authors mainly argue that the incineration of the additional amounts of waste in

recent years would withdraw these from material recovery.

Regarding this point, the UBA would emphasise that the waste hierarchy laid down in the Closed Substance Cycles and Waste Management Act (Kreislaufwirtschafts-/Abfallgesetz) continues to hold: Waste prevention has priority over recovery and disposal. Nevertheless, the use of waste for energy recovery is an indispensable element of sustainable waste management. Waste incineration's task is to ensure the proper and environmentally compatible disposal of the waste it receives.

## Waste incineration and waste prevention: Not a contradiction in terms - 10 arguments

As waste generation is inevitable in a consumer society, it will remain necessary and effective in future to thermally treat those wastes for which there is no environmentally compatible recovery method. Especially in the manufacture of products, waste can often be effectively prevented – by using natural resources more efficiently. Lower material input in production also results in lower quantities of waste. All experience gained over the last decades suggests, however, that waste legislation is a limited tool for the prevention of consumer waste.

There are several reasons that the claim that waste incineration is thwarting waste prevention efforts is unsustainable. The points below also address waste recovery aspects, since interactions exist between waste prevention and waste recycling and recovery which need to be taken into account in our arguments. It is important to note that waste prevention involves a multidimensional environmental policy task which goes far beyond issues related to waste disposal and recovery.

### 1. Waste prevention in production and consumption

Although waste prevention is not directly related to waste management, the latter may provide impetus – through waste prevention plans, for example – towards waste prevention in production and the consumption phase. Specific incentive structures – e.g. for fees – may enhance this impetus towards waste prevention. Waste legislation defines waste prevention as a principle, not a regulatory obligation. Waste prevention is mainly a matter of changing production and consumption patterns. In production, preventing waste – by production-integrated reduction, multiple use and recovery of the input material – is often associated with financial savings and is thus in the companies' own best interest. To promote waste-avoiding modes of consumption, a range of product-related in-

struments is needed, such as influencing product design (“eco-design”), providing procurement incentives and facilitating product choices through information.

## 2. Resource-efficient products

Waste prevention through product innovation, focused among other things on material efficiency, requires environmentally related product design, modification of product portfolios on the supply side, and market penetration of these more resource-efficient products. When developing products, care must be taken to ensure that measures to increase material efficiency do not adversely affect the products’ recyclability, i.e. their return to the material cycle. A set of instruments that can be used in many and varied combinations is available to promote such product innovations - for example, regulatory environmental law, standardisation, labelling, procurement regulations, communication and information, and market incentives. The aim of these business-related measures and instruments is to increase the range of waste-avoiding and resource-efficient alternative products offered and – taking into account consumers’ price-sensitivity – to ensure that these alternatives are offered at prices comparable to those of conventional goods and services. The positioning of these alternative products through e.g. marketing and advertising activities as part of manufacturers’ and businesses’ strategic environmental communication facilitates their market diffusion.

## 3. Offsetting of efficiency gains by growth in volumes

The specific efficiency gains in production and products are often overcompensated by growth in consumption. These so-called rebound effects erode abatement successes achieved through process and product innovations. In other words, products may be manufactured with a relatively low input of materials and energy, but production and sales figures rise. This is true, for example, for consumer electronics and furniture. Efforts to increase efficiency and thus prevent waste are also frustrated by mass production and low-price products from countries with lower wage and production cost levels. So, if waste volumes are to be reduced, buying resource-efficient products is often insufficient. To do so, people must also change their lifestyles.

## 4. Consumer behaviour

Contrary to what is the case in production processes, where microeconomic self-interest may provide incentive to prevent the generation of production waste, everyday habits and obstacles make it dif-

ficult to motivate private and public consumers to opt for a waste-preventing consumption behaviour. Although consumers are broadly willing to contribute to waste recycling in their everyday lives by collecting waste separately, only a minority is prepared to give up certain habits and amenities in favour of waste prevention. Yet, there is a whole range of possibilities for utilising goods and services more intensively and thereby preventing waste: renting, rather than buying, devices seldom used, car-sharing, repairing the dishwasher instead of buying a new one, refurbishing furniture or computers instead of buying new. Up until now, few consumers have made use of these possibilities. The number of households with sustainable consumption habits could grow – to a certain extent – if state and consumer organisations stepped up efforts to provide practical everyday guidance for a resource-efficient consumer behaviour, communicate good-practice examples and show consumers the benefits of such a behaviour.

## 5. Need for waste management

The use of technical processes for the management of residual waste does not influence the public’s consumption habits. The same amount of residual waste for incineration would have arisen without an expansion of thermal waste management. The efficient recycling of, or energy recovery from, these wastes not avoided in production and consumption plays a significant role for environmental protection, as does the associated replacement of primary raw materials.

## 6. Influence of long-term waste management contracts

Some articles in the print media have claimed that waste management contracts – with durations of up to 20 years and fixed quantities for delivery to waste incineration plants – would have a negative impact on waste prevention. This influence is negligible, however. This is because waste management companies have no control over waste volumes, as explained above, but can only influence the ratio of waste quantities for recycling to waste quantities for energy recovery. It seems rather unlikely, and would be difficult to explain to residents, if existing collection systems were changed in favour of the quantities of residual waste destined for incineration. The interest of both municipal and private-sector operators of waste incineration plants in reliably covering investment and operating costs through long-term contracts is justified.

## 7. Product responsibility

Today's arguments against waste incineration as addressed above ignore the fact that the overall situation in waste management has changed fundamentally compared to what it was in the 1980s. At that time, the guiding principle in waste management, "prevention takes precedence over recovery and recovery in turn takes precedence over disposal", was merely a programme, which had not yet been fleshed out by regulatory obligations governing return, take-back and recovery. Today, in contrast, important groups of products are covered by the principle of product responsibility. This principle is a fundamental element of the concept of closed material cycles. Mandatory return and recovery now exists for end-of-life vehicles and waste electrical and electronic equipment, for example, and the Packaging Ordinance regulates the return and recovery of yet another sub-stream of municipal waste. These Ordinances provide incentives for both waste recovery and waste prevention. Waste recovery in trade and industry, as well, is better developed now than ever before (see points 1 and 2).

## 8. Highest recovery rates despite incineration of residual waste

The situation in Germany and other countries with advanced waste management concepts shows that countries that have high waste incineration rates also achieve the highest recycling rates. This is due to effective waste policies and waste management strategies, as applied by several countries such as the Netherlands, Switzerland, Austria, Germany and the Scandinavian countries. These countries recycle much waste, or use it for energy recovery, because they have sharply restricted landfill as a cheap disposal route, for example by taxes, or have even banned it completely.

## 9. Precise sorting as a prerequisite for recovery

To achieve high recycling rates and high-quality recycling, certain waste fractions must be available in a condition as well-sorted as possible. This is achieved predominantly by separate collection, although subsequent sorting of waste fractions collected jointly – for example, in bins for dry recyclable materials – is also possible in some cases (and may be increasingly in future). The remaining residual waste, which cannot be sorted at all or only with an unjustifiable input of resources and therefore is non-recyclable, goes to waste incineration for energy recovery or, in countries where depositing such waste is still allowed, to landfill.

## 10. Disposal security through waste incineration

The current expansion of incineration capacity in Germany is necessary to ensure the proper disposal of wastes which may no longer be landfilled for environmental reasons. As well as expanding recycling, waste incineration is available as an environmentally compatible waste management method.

## Conclusion

Waste incineration does not have a negative impact on waste prevention. Its primary task is the safe and proper disposal of wastes not avoided and not recycled. Waste incineration thus delivers the disposal security which remains necessary in a recycling economy based on material and resource efficiency. The aim is to use the energy contained in waste as efficiently as possible and to fully recover the remaining residues such as slag. Waste prevention is a matter for product design, production, and consumer behaviour. The quantities of product and consumer waste to be disposed of can only be noticeably reduced through resource-efficient products and changes in consumer behaviour. Reducing production waste is possible only through production-integrated measures. Measures in waste management and waste law have a negligible influence on these areas. Once generated, waste must be disposed of in an environmentally sound way. In conclusion, this means that waste must continue to be prevented. Consumers, particularly large-scale, can ensure this by changing their consumption habits; manufacturers, by producing products that involve less consumption of environmental resources and result in less waste and by making manufacture itself more resource-efficient. The wastes that are generated despite these measures are channelled in large part into a recovery process, and waste that cannot be recovered must be disposed of. For this, waste incineration – with energy generation and utilisation of slag – is an environmentally sound option.