Press release

BIBKO® INFRA*TEC* - Recycling of infrastructure waste

- a beneficial investment in economic efficiency, environmental protection and fullfillment of legal requirements

At about 240 million tonnes, mineral waste is by far the largest waste stream in Germany. Its recycling for a sustainable and resource-efficient economy, in which the protection of people and the environment is best guaranteed, represents a central environmental policy task.

The two most important ways of recovering mineral waste are recycling (reprocessing) with the corresponding placement options and other reuse options. Through recycling, primary raw material can be substituted by secondary raw material. This saves important natural resources. Especially in view of the fact that neither sand nor gravel are infinite resources, this point is becoming increasingly important.

Recycling of infrastructural waste

What role does the recycling of infrastructure waste play in this context, as it arises for example in sewer cleaning, road cleaning or freshwater drilling, and what are the benefits?

Goals - Benefits

Three goals and the resulting benefits can be derived from the recycling of infrastructure waste.

- Reduction of disposal costs
  = Improvement of economic efficiency
- Creation of secondary raw material
  = Active environmental protection
- §§ Recycling of waste
  = Fulfillment of legal requirements

Disposal costs - economic efficiency

The *material flow without a recycling machine* usually consists of three stages.

After the waste has been collected, it is handed over to an external disposal company. This company treats the waste and ensures that it is disposed of properly. The company that collects the waste incurs costs for the transfer of the waste to the external disposal company.

In comparison, the *material flow with a* BIBKO® INFRA*TEC*-*recycling machine* is shown below:

- Stage 1: Collectiong of the waste

- Stage 2: Recycling with own recycling machine in own yard

- Stage 3: Material flow 1:
  Reuse

Material flow 2:
Disposal

Stage 3 in the material flow with a BIBKO® INFRA*TEC*-*recycling machine* represents the recycled material after the recycling process. This consists of two material flows.

Material flow 1 (mineral) No disposal costs due to recycling (secondary raw material)
Material flow 2 (other material) Reduction of disposal costs due to ▪ Lower disposal volume ▪ Lower allocation value Z

Material flows - Material flow with recycling machine

The following reuse options are available for material flow 1:

- Cable sand (0...2 mm)
- Pipe bedding (0...2 mm)
- Frost protection layer (0...45 mm)
- Floor mortar/ liquid concrete

The recycling of material flow 1 and the disposal of material flow 2 at reduced costs leads to reduced overall costs and thus to an improvement in the economic efficiency of the company.

Secondary raw materials - environmental protection

Gravel is like sand: In itself, gravel is so abundant that its existence is taken for granted. However, there has been talk of a sand shortage for some years now.

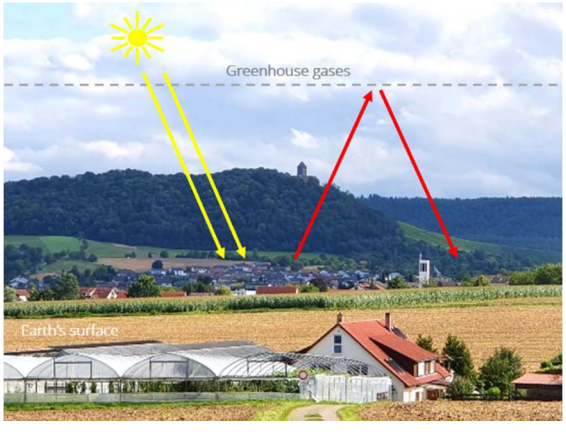
This is the result of worldwide construction projects, in which more of the suitable types of sand are used than are available. This now seems to be the case for gravel as well.
In itself, Germany's gravel reserves are almost infinite. However, a large part of the deposits are now located in water or nature conservation areas, areas are no longer made available by their owners and the designation of new extraction areas takes several years.
Since the demand for both sand and gravel is still considered high, the recycling of these aggregates, including from waste, is becoming increasingly important.

Further benefit

In addition, there is a further benefit: By substituting primary raw materials with secondary raw materials, the emissions (including CO_2) generated during the extraction of primary raw materials are avoided. This additionally contributes to the reduction of global warming and thus reduces the ecological footprint.

What does this mean for the environment?

The earth's surface is warmed by solar radiation. This then emits energy in the form of long-wave infrared radiation. Greenhouse gases (including CO_2) in the atmosphere limit the complete radiation into space. Part of this infrared radiation is reflected back to earth by the greenhouse gases. This results in additional warming. It is thanks to this natural greenhouse effect that life is possible on earth at all. While the average global temperature is around 15°C, it would otherwise be around -18°C.



Greenhouse effect

However, the concentration of greenhouse gases in the atmosphere has increased more and more rapidly in recent years, mainly due to the combustion of fossil fuels. As a result, additional warming of the earth's surface is taking place, leading to the well-known effects such as melting of the polar ice caps, rising sea levels and changes in the extent and distribution of precipitation.

Recycling - Legal requirements

The central law of German waste legislation is the Kreislaufwirtschaftsgesetz (KrWG). The aim of the Act is to promote the circular economy in order to conserve natural resources and to ensure the environmentally sound management of waste (§1 KrWG).
The core of the Kreislaufwirtschaftsgesetz is the 5-level target or waste hierarchy (§6 KrWG). This is a hierarchy of measures to be taken into account for the avoidance of waste of all kinds and specifically in waste management. It includes the following measures:

1. Avoidance
2. Preparation for reuse
3. Recycling (material reuse)
4. Recovery (e.g. energetic)
5. Disposal

5-stage waste hierarchy

In the order of priority, special importance and, if necessary, priority should be given to the measure that best ensures the protection of people and the environment, taking into account the precautionary and sustainability principle. The use of a BIBKO® INFRA*TEC*-recycling machine meets this requirement.

Additional benefit: End of waste status

§5 of the KrWG defines the conditions under which the waste properties of materials and thus the waste-related legal obligations end. This is considered to be fulfilled when a recovery or recycling process has been carried out. The original waste then exists as a *product*. In addition, the following criteria must be fulfilled:

- The *product* can be used for certain purposes
- There is a market or at least a demand for the *product*.
- The *product* meets all technical and legal requirements
- The *product* is harmless to humans and the environment.

Green earth concept

Preferential duty of the public sector

With the new regulation of §45 KrWG, which has been in force since 29.10.2020, federal procurement agencies are also subject to a basic obligation to give preference to environmentally friendly products which

- "have been manufactured using production processes that conserve raw materials [...],
- have been produced [...] by recycling of waste [...],
- are more suitable for environmentally sound waste management than other products [...]".

The public sector is thus obliged to contribute to the fulfilment of §1 KrWG through its conduct.

Summary

With a BIBKO® INFRA*TEC*-recycling machine, secondary raw materials are produced on the one hand, thus actively protecting the environment. On the other hand, the recycling of waste fulfils legal requirements.

Improved economic efficiency

The decisive aspect from a business point of view, however, is the improvement of economic efficiency in the company. Through

- reduction of the disposal volume
  and
- reduction of the Zurodnungswert Z

the disposal costs are reduced. The extent to which economic efficiency is improved is mainly determined by the following two factors:

- Waste volume (t/year)
- Existence of a market or buyer for the secondary raw materials

Recycling of infrastructure waste: goals - benefits (scheme)

Beneficial investment

Based on the above aspects, the recycling of infrastructure waste represents a beneficial investment in terms of economic efficiency, environmental protection and fulfillment of legal requirements.