MODERN TECHNOLOGIES OF THE WASTE RECYCLING SYSTEM IN THE MODERN WORLD

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Annotation:

The separate collection of waste and the recycling of biological waste are becoming increasingly relevant in today's world, this article presents an increase in population and an increase in consumption that leads to an increase in waste and pollution of the environment. At the same time, these problems open up opportunities for the development of new technologies, projects, companies and startup projects aimed at developing innovative methods of waste processing.

Another major benefit of waste recycling is resource conservation. By reusing materials that would otherwise be discarded, we can help reduce the demand for new resources, conserve energy and avoid the environmental impact of resource extraction. This can also have a positive, economic impact on environmental problems of today's nature, as it helps to reduce costs associated with the extraction and processing of resources. In general, recycling helps to create a more sustainable and efficient economy that is better equipped to meet the needs of future generations.

Recycling also helps reduce pollution by reducing the need for extraction and processing of raw materials, which often involves the use of toxic chemicals and contributes to air and water pollution. By reusing materials that would otherwise be discarded, we will help reduce the amount of pollution generated during the production process. In addition, recycling programs can help reduce garbage and other forms of pollution by storing waste outside our streets and living area. In general, processing has many advantages, and this is an important activity that we all have to strive to participate in as much as possible.

Key words: Waste, modern technologies recycling, technologies, food waste, biodegradable materials, hydrolysis, chemical method, industrial products.

Introduction:

Recycling technologies have been improving significantly in recent years-leading to a reduction in emissions as well as an increase in the efficiency of recyclable resources. One of the most promising innovations in recycling technologies is the development of efficient waste sorting systems. These systems use advanced sensors to detect and separate different types of materials, such as paper, plastic and metal. This, combined with improving the quality of raw materials, reduces nature pollution, these processes facilitate the processing and reuse of materials.

Another main focus of innovation technologies in processing technologies is the development of new materials that are easier to reproduce. For example, many companies are using biodegradable plastics that can be easily broken down and reused for other products. In addition, some companies are experimenting with the use of materials such as wood or bamboo as an alternative to traditional plastics. These materials are characterized by being renewable, easy to process, and having little ecological impact.

Due to the increasing ecalogical impact of waste, significant scientific research achievements in the use of robotics and automation in processing technologies are increasing. Robotics helps to quickly and efficiently sort and process materials, reduces the need for manual labor and increases the speed and accuracy of processing processes. This also opens up new opportunities to increase jobs in the recycling industry as workers can now focus on programming and maintaining these new technologies instead of performing manual labor tasks.

Literature analysis.

Joe Romano, in his article, currently produces more than 2 billion tons of waste annually on a global scale. A large portion of this waste ends up in landfills, where it pollutes the local ecosystem, releasing harmful waste and causing environmental and health problems. Unfortunately, this problem is expected to increase the amount of waste generated globally by 2050 to 3.4 billion tons.

One of the best ways to mitigate the environmental impact of solid waste is to introduce intelligent and technologically oriented solutions to the waste management industry. These innovative processes illuminate

collections as facilitating simplification, tracking emissions levels, and increasing recycling rates for individuals and businesses, and helping the environment.

Today, scientists from all over the world are conducting a lot of research work on the increase in the number of ecalogical tragedies, as well as their prevention. the contribution of robotics is also increasing in this.

Analysis and discussion of results.

Some of the new technologies and projects related to waste recycling include:

Biodegradable materials: The development of biodegradable materials that can decompose naturally in the environment will help reduce waste.

Food waste recycling methods: Food waste is one of the largest sources of waste in the world. Some new methods of processing food waste, such as composting and biogas plants, make it possible to obtain energy and fertilizers from waste.

Disposal of electronic devices: Electronic devices may contain toxic substances that may be dangerous to the environment. New technologies for processing electronic devices make it possible to extract valuable materials and minimize harmful effects on the environment.

Waste exchange: This is a new consumption model that invites people to exchange their waste for something useful. This could be similar to a barter system in which people can exchange their waste for goods or services.

Biodegradable materials

Yes, the development of biodegradable materials is one of the ways to combat the problem of waste. Currently, there are various projects and research in this area aimed at creating biodegradable materials for various purposes, from packaging to textiles.

New methods of processing food waste

There are several new and effective methods of processing food waste, here are some of them:

Hydrolysis. This method of processing food waste consists in placing food waste in a reactor where it is exposed to water and temperatures above 100 degrees Celsius. This decomposes proteins, fats and carbohydrates in the waste, creating liquid and solid fractions. The liquid fraction can be used to produce biogas or fertilizers, and the solid fraction can be used to produce animal feed.

Composting. This is the process of recycling organic waste, including food waste, into compost. Compost can be used as fertilizer for a garden or

vegetable garden. Currently, there are new composting technologies that can speed up the composting process, such as the use of electronic devices and microbes.

Biogas plants. This method of recycling food waste involves the use of bacteria to decompose waste and produce gas. This gas can be used for electricity generation or heating.

Animal feed. Some companies recycle food waste into animal feed. This allows you to reduce the amount of waste and use it as nutrients for animals.

Biodegradable polymers. Some companies use food waste to produce biodegradable polymers that can be used as packaging or other products. This reduces the amount of waste and reduces the negative impact on the environment.

Chemical method: This method consists in the use of various chemical reagents for the processing of food waste. The result is the production of products that can be used in various industries.

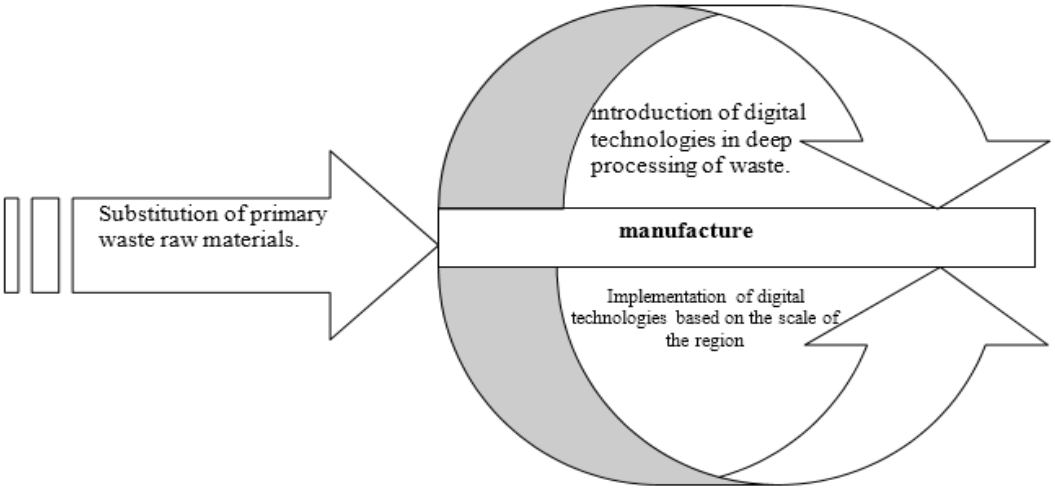

Figure 1: Technologies aimed at minimizing waste production.

Currently, a number of ulclubs are used in the treatment of dirty sewage and wastewater. The most important of these are mechanical, chemical, electrolysis, biological cleaning techniques.

1. Mechanical cleaning style. When cleaning dirty wastewater with a mechanical method, a special facility is built and water-insoluble substances are captured. If the volume of impurities in the water is greater than 5 mm with the help of an iron grid, if smaller, it is captured through iron nets. Liquid substances that float over dirty waters are captured with a lubricant, a lubricant, a lubricant, a lubricant. Also, dirty water is infused in special clarifiers, solid particles are immersed, light ones are released to the

surface of the water and captured.

2. In chemical treatment, contaminants dissolved and insoluble are precipitated or neutralized by adding reagents (reagents) to dirty wastewater and reacting. Through the chemical treatment of dirty water, it is possible to clean up to 95% of the insoluble substances in the water and up to 25% of the dissolved ones.

3. In the electrolysis treatment style, an electric current is sent to the dirty waste water collected in a special facility (electrolysis). As a result, harmful organic substances in dirty water are absorbed, and metals, acids and other inorganic substances are isolated from water. The electrolysis treatment of dirty wastewater has been widely used in recent times.

4. Biological cleaning method. As you know, cleaning dirty water with mechanical, chemical and electrolysis methods is the first stage. The second stage consists of biological treatment of treated water, followed by disposal into bodies of water.

Biological treatment of dirty water in natural conditions is carried out by watering separately isolated lands. In this case, the allocated field is watered, filtered in dirty soil, and then turned out to be clean. At a thickness of 80 cm, the soil has the ability to adequately clean dirty water.

For biological treatment of dirty water in artificial conditions, a special biofilter facility – clarifiers are built. In this case, dirty water is carried out in large materials covered with a biological veil consisting of aerobic microorganisms. By biological treatment of dirty water, industrial, municipal wastewater can be treated up to 98%.

The following 3 sources of solid waste are known in the chemical industry:

1. Remains of raw materials, semi-products, materials and objects, products that appear during physical and chemical processing of raw materials, as well as waste that occurs during mining and enrichment of minerals.

2. Substances that are contained in natural and wastewater and are retained in the treatment of dirty gases.

3. Household waste

Waste in the first batch is formed during the production process. The Material or product will have completely or partially lost its physical and chemical properties. In the process of processing mines (for example, in the processing of apatito-nepheline mines, potash, sulfates, phosphates and other mines), 30-40% of the product is obtained in total. The rest of the material is left in the form of pebbles and moths in pits, trenches and powder

collectors.

Waste in the second group occurs mainly in dust-holding devices during mechanical cleaning of gases. The amount of this waste is relatively low, which is returned to the production process. Dust stuck in the filters is removed along with the filtering material during preventive maintenance of the filter.

It is known that during the mechanical cleaning of wastewater, sediment and turbidity appear. They will be composed of aqueous suspensions of mineral and organic substances. The concentrations of sediment in wastewater can range from 20-100 g/L, with volumes ranging from 0.5% to 5% in industrial and domestic wastewater co-treatment stations, and 10% to 30% in local treatment facilities. The composition and physical and chemical properties of sediments can be different. Therefore, they can be divided into three groups:

1. Mineral sediments.
2. Organic sediments.
3. Excess active turbidity.

It is known that during the biological treatment of wastewater at aeration stations, wet (raw) precipitates are obtained from the grates and the first clarifier, and active turbidity is obtained from the second clarifier. These sediments differ in composition and physical and chemical properties from one to the other. Wet (raw) sediment is an aqueous suspension composed of 6-7 different substances, 75% of which is organic matter. While active turbidity consists of 99% moisture and 160 g biomass in 1m3 water.

In order to neutralize the sediments formed during the treatment of wastewater, they are burned in special furnaces and turned into powder. In most cases, organomineral fertilizers are obtained from these waste and used in agriculture.

The waste in the third group includes plastics that have passed the use respite, have become obsolete, unsuitable for use, rubber and films made from them, fibers, mortars, metals and their alloys and other similar materials. They can be processed and obtained from various products.

Taking into account the environmental and economic aspects of this problem, let's dwell on it in more detail.

Currently, the population of the land, production products and industrial waste are increasing over the exponential law. Environmental polluting emissions associated with human activity are increasing more rapidly compared to land population growth. For example, Japan Z5 million t per year., Russia has a net worth of 70 million t. and the US 210 million t.

waste disposal. The amount of household waste in the world is about 3%, and in some countries it is 10%. Paper and cardboard waste accounts for 10% of garbage collected in landfills, and glass waste accounts for 3%. In Moscow, Z million t per year. solid waste is collected, and household waste accounts for 80% of it. This means that 270 kg of household garbage per year is suitable for every Muscovite citizen. About 8500 t per day from Moscow. garbage is released, which is 3 times less than in New York.

Waste in the third group also includes vehicles and similar devices and equipment that have become obsolete, run-down, unsuitable for use. At the moment, instead of reviving 286 and 386 stamped computers in developed countries, they are selling them to developing countries and making huge profits. Because the process of their restoration or processing requires a lot of energy and funds.

The household waste group includes cardboard, paper, wrapping paper, agricultural waste, utility and food waste. Paper and cardboard account for the bulk (37%) of municipal solid waste. At the moment, there is such a misconception that it is as if "paper products are a fast-breaking product". One of the factors that accelerate the decomposition of paper is water. But in practice, water is not poured in the landfills, since water causes the formation of methane (SN4) gas. The paper, on the other hand, has been rotting in garbage dumps for years.

In terms of quantity, the second place is kitchen waste.

5% of solid household waste is made up of artificial and synthetic materials (polyethylene, polypropylene, polyvinyl chloride, organic glass and films made from them, fibers, wrapping films and other items). Most types of plastics are not recirculated and do not decompose under the influence of microorganisms.

Metals and glass products account for 3% of household waste. Wood fragments, bones and stones make up 1-2%, but synthetic fabrics and fabrics make up 5%.

In addition, if the garbage generated in the extraction of raw materials forms a separate group, the waste of nuclear fuels, which are subject to use responders, forms a separate group. It is known that raw materials for the production of electricity (gas, oil, coal, etc.) that produce waste from mining and processing them. It is natural that they contain radioactive and toxic waste. And they are extremely dangerous for human health and the environment.

It is worth noting that over the past 5-10 years, scientific journals have been talking about a new type of garbage-space garbage. Indeed,

astronauts who have climbed into space can inadvertently drop this or that material from their hands. These materials (ombir, gloves, conductors, bolt, nut, shurub, etc.) crashing into a Space Station flying at great speed can cause the spacecraft to crash. Therefore, recently the International Space Station has been moved from its orbit to a different orbit. On the Jaxon scale, such disasters have been observed 4 times. In addition, in recent years, not only space, but also oceans have been transformed into an "international dump". For example, recently, the Mir space station, weighing 150 tons, was sunk in the Pacific Ocean after passing a performance respite. According to data, 95% of all debris in Earth orbit is being accounted for by failed satellites, astronaut collars, and similar debris. 75% of" space garbage " corresponds to the Russian share. Such garbage poses a great danger not only to the Earth's population, but also to all spacecraft, satellites and shatls operating in space.

In the words of noted scientist and science fiction writer Arthur Clark " " solid waste is such a raw material, or we will not use it because of our defective ignorance!".

Summary

In the main years, measures were developed to use valuable outputs in the national economy. For this, hygienic rules are followed, waste is used in cases where it does not harm the health of the population and the environment.

Industrial Products Act as raw materials in the preparation of mineral and organic products, building materials and products. For example, if 1 million tons of tailings (cuttings) from chemical and oil industries are processed back, then 4,300 tons of cobalt can be obtained from it. Metallurgical combinations can be obtained from stone quarries (slag) and from enterprises where thermal energy is produced, mineral ores, cement and finally transferred mineral fibers. Payment for their concreteness can work qualitatively, from which the definition of services can be made of resilient materials.

The industry works for the purpose of producing agricultural crops in the places of harvesting produced water. But on an industrial scale, such outputs will be raw, there is no way to use them. They are discharged by means of elimination or reddening, and in financially made proligons. For example, the plant produced for agricultural processing of 65 thousand tons of inhabitants per year, processing small Organics was built in the city of St. Petersburg. Iron, plastic, stones, bottles and other solid materials are separated from the network tarpaulin key, which are taken into a working

drum with a length of 60 m and a diameter of 4 m. In this biobaraban, garbage is separated, after 1-3 days the information name is given, and information about biochemical processes is up to 50-60. This temperature definition is said to be a pile of garbage due to the activity of microorganisms.

Currently, a 600-700 ton per day population processing plant is being built in industrialized countries. It is possible to obtain information about long distances of 300-500 m, since the enterprises produced between them work and work around 1000-1300 years. It works to obtain electricity in bathrooms, businesses and from the heat generated.

If the waste is that poisonous (mercury, margarine, yolk, agricultural products) and water-soluble, then in the trenches in which they are, the wall is accompanied by containers prepared with a thickness of 10 mm. The taiga, upperside, and secondary sides of the Uranium will be detected.

The grooves are filled with clay 2-2.5 m thick,then the soil is pulled to replace the plants.

If the exits continue and in situations where it is difficult to process them, it turns out that it is separated from the Water, leads and leads to help, continues. In terms of waste processing, the temperature reaches 1300 DK, and thermal energy can be used in this.

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