



THE ROLE OF CHEMICAL TECHNOLOGIES IN THE RECYCLING OF ECOLOGICAL HOUSEHOLD WASTE

Saibnazarova Gulnara Bektemirovna
Jizzakh Polytechnic Institute

Abstract: *There are two approaches to technical innovations in the field of ecology. The first is that new technologies and processes minimize the costs of eliminating sources of pollution, and the second is that new technologies (the correct option for approaching this issue) provide a radical elimination of the cause of real or potential environmental problems.*

The focus on improving the environment is traditional, which requires taking into account direct costs. In recent years, a number of leading companies have focused their attention on preventive measures against pollution.

Keywords: *Correlation, resource, raw material, petrochemicals, oil, gas, portfolio, organochlorine, catalyst, organochlorine substances.*

Аннотация: *Существует два подхода к техническим инновациям в области экологии. Первый заключается в том, что новые технологии и процессы минимизируют затраты на устранение источников загрязнения, а второй — в том, что новые технологии (верный подход к решению этой проблемы) обеспечивают радикальное устранение причины реальных или потенциальных экологических проблем.*

Традиционно акцент на улучшении состояния окружающей среды требует учета прямых затрат. В последние годы ряд ведущих компаний сосредоточили внимание на превентивных мерах борьбы с загрязнением.

Ключевые слова: *Корреляция, ресурс, сырье, нефтехимия, нефть, газ, портфель, хлорорганические соединения, катализатор, хлорорганические вещества.*

Environmental policy, the economy, and innovations allow Germany's chemical and petrochemical industry enterprises to strengthen their leading positions. A careful attitude toward the environment makes it possible to use new and eco-friendly raw materials. Accordingly, the final products are also considered environmentally friendly.

A human being always strives for goodness. Therefore, everything surrounding them should be beneficial and harmless. However, the chemical and petrochemical industries are among the main sources of environmental pollution. In terms of total emissions released into the atmosphere, the chemical complex ranks tenth, while in terms of discharges into natural water bodies, it ranks second among industrial sectors. Over the last decade, the approved concept of sustainable development has required the harmonization of economic and environmental policies.

Environmental policy is being actively implemented in the economic strategies of developed countries and major corporations. It includes a system aimed at the rational use, protection, and restoration of natural resources both domestically and internationally. This policy is carried out at the state level and by companies that have committed to following these standards within their development strategies. Consequently, the European Union has recently tightened control not only over product quality but also over environmental safety.

The close integration of environmental policy, economy, and innovation allows Germany's chemical and petrochemical industry to maintain its position as a leading supplier of products. Therefore, the final product is also environmentally clean [1].

In Germany's chemical and petrochemical enterprises, strict compliance with EN ISO 9001 and EN ISO 14001 standards ensures consistent production process monitoring and sustainability. Implementing and certifying ISO 14001 increases competitiveness by improving technological processes, reducing costs, and introducing new, more reliable, and efficient ideas [2].

The advantages of internationally recognized standards are well known. Participation in international tenders requires adherence to the technical

requirements and standards specified in the tender conditions. Such international standards guarantee equal conditions for all participants.

In many cases, there is still a perception that high environmental efficiency is associated with high costs, low profits, and other unfavorable indicators. However, from a realistic point of view, there is a stable positive correlation between high environmental efficiency and profitability among companies. Over the past decade, positive progress has been observed between addressing environmental issues and achieving economic success [4].

For Germany, this represents one of the most demanding environmental laws, which simultaneously demonstrates high economic growth.

The environmental management system can also assist managers who are genuinely concerned with solving environmental problems that affect their enterprises. The existence of an environmental management system also plays an important role in protecting companies from legal liability

Many managers still do not fully realize how costly environmental disasters and other harmful factors can be. In fact, about 91% of total losses occur due to shortcomings in management systems.

A properly designed environmental management system makes it possible to identify effective ways to reduce costs, encourage managerial and technological innovations, and lower the cost of production.

There are two main approaches to technological innovation in the field of ecology.

The first approach aims to minimize the costs of eliminating pollutant sources through new technologies and processes.

The second approach—which is considered the correct one—ensures the elimination of the root causes of actual or potential environmental problems through new technologies.

The focus on improving environmental conditions has traditionally been associated with taking direct costs into account. In recent years, however, more advanced companies have begun to concentrate primarily on preventive measures against pollution. One such measure is known as “source reduction”, which involves addressing problems at the earliest stages of production in order to minimize environmental impact and reduce pollution.

The “continuous improvement” concept outlined in the ISO 14001 standard enables progress and improvement at all stages of the product life cycle.

Many German companies that have implemented the ISO 14001 standard have discovered numerous opportunities to save resources, including improving efficiency and reducing material and water consumption.

The advantages of implementing ISO 14001 in German chemical industry enterprises include:

- Reduction of waste volume;

- Decrease in waste management costs from \$72,000 to \$24,000;

- Energy savings;

- Improved strategic planning.

Let us consider the solution to environmental problems in the chemical industry using BASF as an example.

The BASF Group is one of the world’s largest international chemical corporations, founded in 1865 in Ludwigshafen. BASF operates nearly 150 industrial sites on various continents and supplies its products to more than 200 countries, making it a global leader in the chemical industry.

The company’s portfolio includes oil and natural gas, chemicals, plastics, specialty chemicals, agricultural and fine chemical products. BASF employs about 95,000 people, and in 2007 its sales volume amounted to 58 billion euros.

From basic raw materials such as oil, natural gas, and sulfur, the company produces more than 8,000 different products. The large amount of intermediate

products generated during production are not discarded but instead used as raw materials for other industrial processes.

BASF's activities include the extraction and processing of raw materials and energy resources, production of various chemicals, agricultural products, consumer goods (including paints, coatings, information systems, and pharmaceuticals).

As early as 1985, BASF began implementing measures aimed at protecting the environment, ensuring safety, and maintaining health. These measures include:

Economic interests never taking precedence over safety, health, and environmental protection;

Manufacturing environmentally safe products, ensuring their efficient use, and proper waste disposal;

Minimizing environmental impact during production, transportation, and storage of products;

Assisting consumers in the safe and effective use of products;

Continuously developing science and technology to enhance environmental protection and safety.

The Ludwigshafen site alone has about 350 production units where chemical products are manufactured in an integrated system. Environmental monitoring (air, noise, water quality, and soil) is conducted at 43 internal and external locations within the site.

BASF disposes of its waste using a specialized European facility, where 200,000 tons of waste are processed annually in eight furnaces.

The company's experience in catalytic chemistry and chemical technologies can be illustrated with several examples. BASF also produces catalysts used for oxidizing various waste gases. The use of these catalysts has significantly reduced the emission of pollutants into the atmosphere. In recent years, the company has developed new catalysts that are now being used in many cities around the world for waste recycling processes.

The effective use of catalysts in the chemical industry is considered highly efficient, as they not only reduce energy consumption but also increase the selectivity of processes. Currently, catalysts are used in about 80% of various technological processes. The significant environmental impact of intermediate products can be observed in the catalyst used for acrylic acid production. Acrylic acid is effectively utilized in the manufacture of dispersions, lacquers, superabsorbents, and other products.

As a result of research conducted over the past 25 years, the amount of unnecessary intermediate products has been reduced by up to 75%. Catalysts are also efficiently used in obtaining desired products from raw materials. The reduction of waste has also led to a considerable decrease in energy consumption.

In vinyl chloride production, an important intermediate product, dichloroethane, is obtained by oxidizing ethylene in the presence of hydrochloric acid and air. This process is accompanied by the formation of CO and chlorinated hydrocarbons. To reduce the amount of such gases, it is advisable to use oxygen as an oxidizing agent.

The water formed during the technological process is contaminated with chlorinated organic compounds, and to minimize its environmental impact, an additional regenerator column was installed, which helps eliminate chlorine-containing organic substances. Cooling water was also used in this process, which, before the modernization of the workshop, was discharged into a nearby harbor basin. After the necessary engineering improvements were carried out, the release of organic substances into seawater was completely prevented.

List of used literature

1. Сергеева З.Х. Роль химических парков в развитии инновационных технологий в сфере переработки углеводородного сырья (опыт Германии)//Вест. Казан.технол.университета-2012,-Т-15,№1-с. 250-259

2. Салли Л. Гузман ISO 14001-выживание бизнеса //материалы 3-ей международной конференции по системам охраны окружающей среды и

стандартам ISO 14000. Дубай, 14-17 февраля 1998 г (<http://iso 90002000.narod.ru/index.html>)

3. Мурзин Д.Ю. Примеры решения экологических проблем. //Аналитический портал химической промышленности (<http://www/newchemistry.ru>)

4. Ғ.Авалбоев.,З.Норқулова. Глобал экологик муаммолар. //Экология хабарномаси-2018,11/2018, 40-42бетлар.