

The concept of sustainable development.

Green technologies are part of the general concept of sustainable development or sustainability of civilization.

Green IT is becoming an increasingly voluminous and important component of sustainable development, so it can be considered in two sections: as an object of analysis (how to ensure sustainable development of IT as a component of sustainable development of technologies in general and civilization in general) and as an object of development and application (for sustainable development) within this concept.

One of the directions of the concept of sustainable development is the assessment of products from the point of view of their environmental hazards.

This assessment can be used to study the environmental impact either during the production of the product, or the impact of the product during its use and subsequent disposal.

Life cycle - consecutive and interconnected stages of the life system of a product or process, starting with the extraction of natural resources and ending with waste disposal.

Ecobalance is one of the methods of estimating costs associated with the production of products, which takes into account ecological aspects and the potential of their impact on the environment, from the extraction of raw materials, through their production, application and disposal."

Life cycle assessment is the process of assessing the environmental impacts associated with a product, process or other activity by identifying and quantifying:

- volumes of consumed energy, material resources and emissions into the environment,**
- quantitative and qualitative assessment of their impact on the environment,**
- identification and assessment of opportunities for improving the ecological status of the system.**

Life cycle assessment is a systematic set of procedures for collecting and analyzing all material and energy flows of a system, including environmental impacts during the entire life cycle of a product and/or process.

The key elements of life cycle assessment (LCA) are:

- Identification and measurement of environmental load, i.e., consumption of energy and raw materials, emissions, discharges and generated waste;**
- Assessment of potential environmental impacts of these loads;**
- Assessment of available options for reducing these environmental impacts.**

Life cycle assessment consists of four stages:

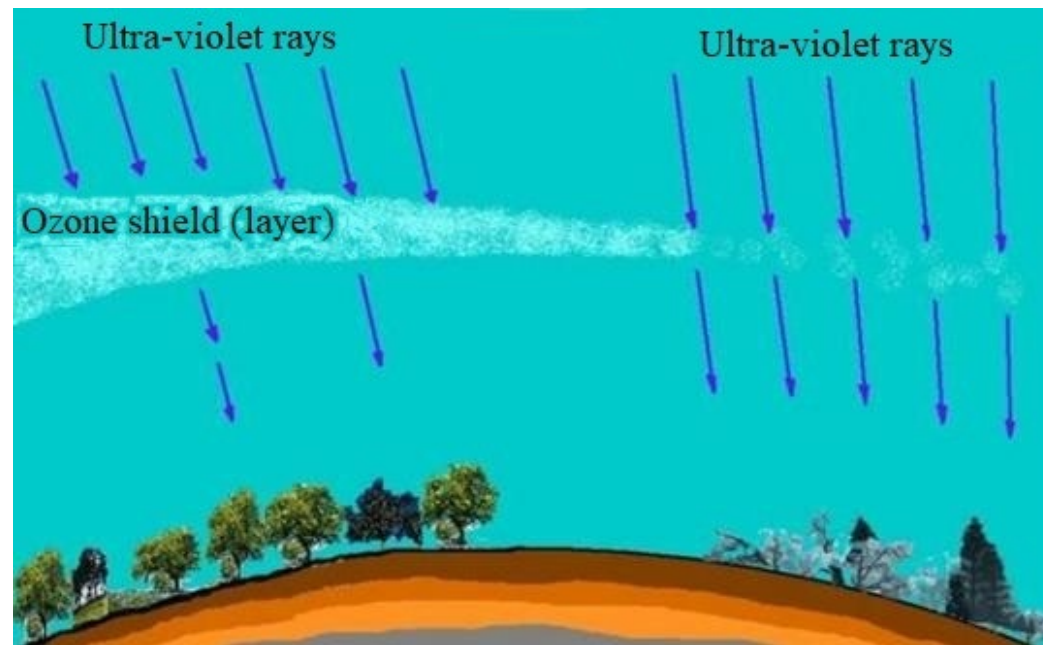
- 1) Determination of the purpose and scope of application**
- 2) Life cycle inventory analysis**
- 3) Life cycle impact assessment**
- 4) Interpretation of the life cycle**

Global warming or climate change.

Are climatic changes that occur as a result of an increase in the concentration of greenhouse gases in the atmosphere, which transmit the sun's rays and retain infrared radiation reflected from the Earth's surface.

Destruction of the ozone layer.

The thinning of the ozone layer occurs as a result of the accelerated destruction of ozone in the stratosphere, which occurs due to the migration and photolysis of gases containing chlorine and bromine.



The formation of photochemical smog occurs in the surface layer of the troposphere during the oxidation of a number of light organic compounds and carbon monoxide with the participation of nitrogen oxides (NO_x) in the presence of sunlight.



Ecotoxicity.

Ecotoxics are understood as substances or wastes that, in the case of entering the environment, pose or may immediately or later pose a threat to the environment due to bioaccumulation and/or have a toxic effect on biotic systems.

Development of green technologies based on resource approach.

The analysis of energy-saving solutions used in the organization and functioning of computer equipment - controllers, processors, microcontrollers, microprocessors, specialized circuit solutions for programmable logic integrated circuits (PLCs) made it possible to identify:

almost all energy-saving solutions exploit the same idea of reducing the supply voltage until it is turned off for temporarily inactive elements of the structure.

For example, the line of STM8L15x/162 microcontrollers implements five power saving modes:

Wait - CPU is stopped, peripheral devices are working;

Low power run - the program runs with charging RAM, selected peripherals are active;

Low power wait - CPU is stopped, selected peripheral devices are active;

Active-halt - CPU is stopped, AWU, WDT and RTC continue to work if enabled;

Halt - clocking of the CPU and peripheral devices is stopped (everything is stopped).

Natural resources.

In the development of resources, a distinction is made between price and value.

The price of the target resource consists of its cost and profit, the size of which is determined by the difference between the value and the cost at the time of pricing.

The cost remains fixed, as do the costs of most paid resources.

Value is formed by the features of the target resource, which are revealed in its internal organization and functioning and are evaluated in relation to other features or features of other resources. At the time of pricing, the features for which the resource is created are mainly taken into account.

The degree of parallelization of the resource into components: target and natural is determined by the success of its development in a particularly parallel and blurred surrounding world.