

Necessity of environmental technologies implementation in Romania

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Abstract: Environmental technology refers to those technologies, products, services, facilities, management and organizational systems whose production and application/use involves reducing the negative environmental impact compared with relevant technological alternatives. National Strategy for Sustainable Development of Romania sets targets and ways of action to implement these technologies on the horizon of years 2013, 2020, 2030, according to the EU's strategic guidelines. Main chapters of interest relates to climate change and clean energy, sustainable transport, sustainable consumption and production, conservation and management of natural resources. This paper wants to emphasize the importance of implementing environmental technologies in Romania.

Keywords: environmental technology, environmental protection, resource management, sustainable development

1. INTRODUCTION

Environmental technologies include all technologies whose use brings less environmental damage than technological alternatives on the market. The definition should be understood in a broader sense, which includes know-how, methods and procedures, materials and services, facilities and management systems whose application reduces environmental pressures:

- technologies and processes to reduce pollution (ex. air pollution control equipment, waste treatment plants);
- products and services whose production are cleaner and uses less resources than traditional alternatives;
- how effective management of resources (ex. water efficient systems, energy-efficient technologies).

Environmental technologies thus defined covers technologies in all economic sectors and activities where used, often lead to lower production costs by reducing consumption of resources and energy, generating fewer emissions and less waste quantities.

Need to promote and implement environmental technologies is given the benefits of these:

- Are beneficial for business;
- Stimulate innovation;

- Reduce production costs;
- Create jobs;
- Encourage competitiveness;
- Provides solutions for reducing the intake of materials;
- Reduce energy consumption and air emissions;
- Enable recovery of secondary valuable products;
- Minimising waste disposal problems.

This increase environmental efficiency or, in other words, "do more with less", supporting the implementation of environmental management systems and make ecological the production processes. [1], [2]

2. ETAP

In 2004, the European Commission launched the Environmental Technologies Action Plan – ETAP as a tool for stimulating widespread application of technological solutions for environmental protection, initiative to reduce barriers that impede the development of environmental technologies.

ETAP complement regulation initiatives of the European Commission and addresses directly the three dimensions of the Lisbon strategy: growth, jobs and the environment. On the stage, Member States have developed national roadmaps official describing plans, actions and accomplishments related to environmental technologies and eco-innovations.

This is done through a series of measures to promote eco-innovation and environmental technologies use. The European Commission cooperates with Member States and industry to implement these measures.

Priority is given to the following areas:

- The transfer of environmental technologies from the research stage to market availability;
- Improving market conditions;
- Global action

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For Romania has developed a roadmap for implementing the Action Plan for Environmental Technologies (HG 1568/2008 approving the roadmap for implementing the Environmental Technologies Action Plan - ETAP Romania, covering the period from 2008 to 2009).

EU Member States were invited in 2004 to develop national action plans (national roadmaps) for ETAP objectives. These should include a description of the current situation (policies, programs, relevant economic instruments).

ETAP supports the Lisbon strategy and sustainable development, contributing to economic growth while improving environmental conditions and protecting natural resources.

Importance of eco-innovation is fully recognized in the Lisbon Strategy, the EU Sustainable Development Strategy and the Sixth Environment Action Programme (6EAP). Environmental Technologies Action Plan (ETAP), adopted to be implemented in January 2004, complements the regulation initiatives of the European Commission.

ETAP includes a series of actions to promote eco-innovation and environmental technologies adoption. Its priorities are to promote research and development, to mobilize funds and help boost demand and improving market conditions. [1], [2]

Eco-innovation is financed by the Competitiveness and Innovation Programme and has a budget of 200 million euro for the period 2008-2013. It supports products proven in terms of technology, which helps to make better use of natural resources in Europe. The program is managed by the Executive Agency for Competitiveness and Innovation (EACI).

Research and development is an important element of the Lisbon Strategy, which aims to "make Europe the most competitive and dynamic knowledge-based economy in the world". The Seventh EU Framework Programme (FP7) for research (2007-2013) is also expected to play an important role in achieving the Lisbon objectives. Several European Technology Platforms FP7 will continue to drive the industry needs.

Europe targets: a 20% reduction of greenhouse gas emissions by 2020 (compared with 1990 levels), 20% of energy to come from renewable sources by 2020, and 10% of road transport fuels come of biofuels. Such targets have created a potential for new energy technologies.

There are great opportunities in Europe to efficiently use the latest technologies in energy, transport and use of materials. European companies are strong especially in renewable energy production and waste management and recycling in these sectors with a global market share of 40% and 50% respectively. [1], [2], [3]

3. CATEGORIES OF ENVIRONMENTAL TECHNOLOGIES

A. Pollution Control Technology (water treatment for drinking, wastewater treatment, soil decontamination etc.);

B. "Clean" Process Technologies (new manufacturing processes that are cleaner and / or more efficient use of resources);

C. Waste management services (collection, transport, storage, recovery, recycling or disposal of waste, recovery technologies for useful substances from waste, equipment used in the activity of waste management etc.);

D. Non-invasive monitoring of environment and monitoring tools;

E. Technologies for obtaining the "green energy" (electricity and heat from renewable sources);

F. Control and reduce noise and vibration;

G. Ecological building materials and technologies (ecological construction and isolation systems, passive house, green buildings etc.).

Environmental technologies are used to collect information about the environment - monitoring and data collection for the presence of pollutants, changes in the earth's surface, or to detect effects on human health through biomonitoring.

Environmental technologies are able to, over the next decade to help reduce the 25-80% emissions of greenhouse gases, the ozone depletion by 50% and acidification and eutrophication by 50%. [4]

4. CURRENT SITUATION, PROBLEMS AND ACHIEVEMENTS IN ROMANIA

A. Pollution Control Technology

Romania will have to solve environmental problems related to air pollution, to implement European rules on air quality. These include excess emissions in small particles (PM10). In Romania, in 2005 and so far there have never been dust concentrations to the limit allowed is shocking conclusion to statistics provided by the National Environmental Protection Agency (NEPA).

Most companies providing pollution control technology focuses mainly on the water treatment for drinking, municipal and industrial wastewater treatment. Soil decontamination (especially if oil contamination) and air cleaning are much less represented. [4]

B. "Clean" Process Technologies

In all sectors of economy are need to be upgraded, by replacing old equipment and facilities on the basis of BAT (Best Available Techniques).

The market of "clean" process technology is growing due to legislation which requiring of companies which polluting or use intensively the resource to be refurbished. In Romania exist companies that have realized that sustainable development of the company, even if it requires higher investment, can provide resistance in an environment of increasing competition of company.

Improving the production process for reducing of resource consumption and of the waste amount resulting from the manufacturing process, leading in finally, to substantial amortization of costs.

In Romania, all research institutes develop "clean" process technology and solutions, with the facilities offered by participating in various consortia

in order to attract European grant funds. There are also private companies that have research - development - innovation activity and developed their own "clean" process technologies, some of which are also patented. [4]

C. Waste Management

Waste management refers to the collection, transport, processing, recycling, storage and disposal of waste.

The European Union has firm principles on which based the various levels of waste management systems:

- The principle of prevention;
- The principle of responsibility of payment of production and pollution;
- The precautionary principle;
- The proximity principle.

In the current period is again increasingly imperative need of 3Rs: recover, revaluation, recycling.

Romania ranks last in Europe in terms of waste recycling and stay not good to the selective collection. Percentage of waste recycled is less than 1%. The problem lies not in legislation but in its implementation. However, the deadline for transposition of the European Directive on waste high quality recycling in Romanian legislation was December 12, 2010.

Collection, recycling and treatment of waste is a priority and is reflected in the commitments assumed by Romania to the European Union. According to European legislation, Romania has to recycle in 2013, 55% of generated packaging waste.

Problems of waste management in Romania are:

- existing landfills are often located in sensitive locations (close to dwellings, surface water or groundwater, recreation areas);
- landfills are not properly designed for environment protection;
- lead to water and soil pollution in those areas;
- current waste deposits, especially the deposits of waste from towns, are not operated properly: not compacted and not regularly cover with inert materials to prevent fire and odors spread, not is a strict control of the quality and quantity of waste input in deposit, not exist facilities for produced biogas control, primary and secondary roads on which move the waste transportation equipment are not maintained, vehicles are not washed out of the landfills, many landfills are not equipped with enclosure, with appropriate entrance and warning panels;
- the land for landfills are considered degraded land that can no longer be used for agricultural purposes;
- waste collection from households is not selective, they end up in landfills as such, mixed, thus losing a great part of their useful potential (paper, glass, metals, plastics);
- many useful recyclable materials are stored together with the non-recyclable waste; being

mixed and contaminated chemically and biologically, their recovery is difficult.

After European model, was adopted in Romania the "Green Dot" (Der Grüne Punkt), which marks presence on package certifies that the manufacturer has paid a fee for that type of packaging to a national organization for package recovery, in accordance with the European Directive of packaging waste.

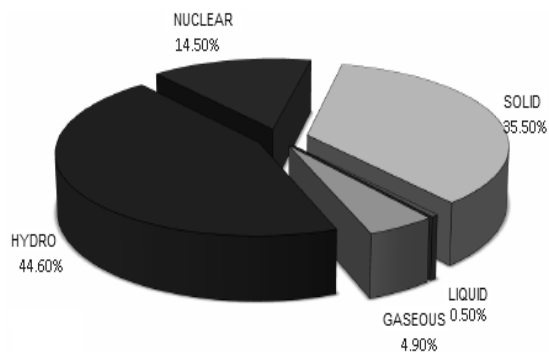
As a member of the European Union, Romania has an obligation to collect and recycle annually 80,000 tons of waste from electrical and electronic equipment (WEEE). Collection and management of waste from electrical and electronic equipment (WEEE) was regulated at EU level by Directive 96/2002 of the European Commission, in Romania being implemented by Government Decision (HG 448/2005). [4]

D. Non-invasive monitoring of environment

Environment monitoring activity is carried out mainly by research institutes and consulting firms, specializing in environmental issues or environmental engineering. Are available only little information on the tools for noninvasive monitoring environment. [4]

E. Technologies for obtaining the "green energy"

Romania has committed that by 2020 to exceeding target imposed by the European Directive known as "Directive 20/20/20" and reach a share of 24% of energy produced from renewable sources in total consumption (Fig. 1). If until now, these renewable energy sources were represented only by the hydrological resources, since 2008 appeared the investors interested in the development of wind parks, especially in Dobrogea. Increased interest of investors is mainly due to Romania's wind potential estimated at 14,000 MW, the largest in South-East Europe, and the Romanian legislation, which providing incentives for energy producers and taking priority on the network of electricity.

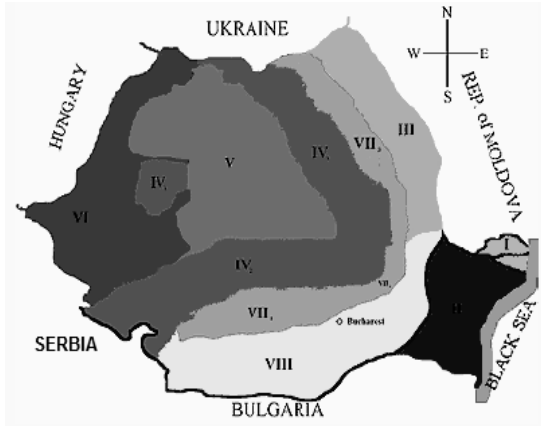


Source: ANRE - Report of the results of the electricity market monitoring in May 2010

Fig. 1. Production structure of the national energy system on the types of resources

But there are problems regarding to wind energy production. The current infrastructure of the Romanian energy system cannot take more than 4000 MW, which is less than 30% of potential production and the development of a wind park required a big number of authorizations.

In addition to the wind energy sectors, which left in obscurity other renewable resources, experts expect other sectors to register increasing. First, the solar resource, which, even if not sufficient to produce electricity on an industrial scale, can offer very attractive solutions for providing heat and hot water. And the six green certificates granted by law to investors in this area can be a substantial boost. However, biogas has great potential for Romania, in conjunction with the development of agriculture, as well as biomass (Fig.2). [4]



Source: Energy Strategy of Romania for the period 2007 - 2020

Fig. 2. Map of available renewable energy resources by regions

Legend:

- I. Delta (solar energy);
- II. Dobrogea (solar and wind);
- III. Moldova (plains and plateaus - micro hydro, wind and biomass);
- IV. Carpathian Mountains (IV1 - Eastern Carpathians, IV2 - South Carpathians, IV3 - Western Carpathians (biomass, micro hydro);
- V. Transylvanian Plateau (micro hydro);
- VI. Western Plain (geothermal energy);
- VII. Subcarpathians (VII1 - Getic Subcarpathians; VII2 - Subcarpathians of curvature, VII3 - Subcarpathians of Moldova: biomass, micro hydro);
- VIII. Southern Plain (biomass, geothermal and solar).

F. Control and reduce noise and vibration

Noise pollution is an increasingly common phenomenon, especially in large urban areas, due mainly road, but there is not interest in reducing its intensity. Activity is confined to monitoring noise and vibration and noise maps making. [4]

G. Ecological building materials and technologies (passive house, green building)

The program of installation of heating systems using renewable energy, including replacing or complementing traditional heating systems, popularly called the program "Green House" became operational from 1 July 2010. The program purpose is to improve the quality of air, water and soil by reducing pollution caused by wood burning and fossil fuels used to produce thermal energy used for heating and hot water production for householders. Through a grant from the Environmental Fund for installation of heating systems which use renewable energy projects, including replacing or complementing traditional heating systems, it encourages the use of systems which use clean, renewable energy sources.

The "Green House" appeared in the context of the European Parliament voted deadline for compulsory green building. Thus, in 2019 all newly constructed buildings in the European Union must produce the same amount of energy they consume. For public buildings, deadline is 2016.

In Romania are already companies that designs and execute passive houses, the price per built square meter was even lower than in a conventional building. Also, there are manufacturers of ecological building materials and insulating boards with a good thermal efficiency. [4]

5. CONCLUSIONS

Only the implementation of environmental technologies cannot solve environmental problems in Europe, respectively in Romania. Is necessary a combination of approaches, from legislative measures to voluntary actions to achieve clear environmental and economic benefits. Regulations like the Directive on Integrated Pollution Prevention and Control (IPPC) proved to be an effective way to encourage industry and businesses in Europe to reduce waste and take recycling by promoting the use of green technologies; similarly, the voluntary approaches like management and audit scheme system (EMAS) determined the continuous improvement of environmental performance for thousands of industries and organizations in Europe.

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