ECO-MANAGEMENT FOR SUSTAINABLE DEVELOPMENT USING THE CIRCULAR ECONOMY

Anca IUGA (BUTNARIU)

*" Transilvania "University of Brasov, Department of Engineering and Industrial Management, Braşov, România, (ancadezv@yahoo.com)

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Abstract: *The eco-management is considered a key issue regarding the sustainable development of industrial products using circular economy principles. The article is focused on eco-management as a new way to solve the challenges for Romanian green industry according with European Union requirements.*

Thus, were identified the correlation between the elements of eco-management and eco-sustainable development..

Keywords: *eco-management, product eco-design, circular economy, eco-sustainability, eco-design, sustainable development*

1. ECO-MANAGEMENT

Eco-management is the science or art to develop productive activities or doing business that have a minimal impact on the environment. Sustainable Development Strategy of the European Union has the overall objective of continuously improving the quality of life for present and future generations through the creation of sustainable communities able to manage and use resources efficiently and to tap the potential of eco-innovation and social economy, ensuring prosperity, environmental protection and social cohesion. The rapid technological advance in the field of industrial production led to the phenomenon of obsolescence of products due to the emergence of new models performing shortly, with the ensuing consequences such as lowering the value of equipment, increasing the amount of waste from throwing trash such equipment considered to be obsolete technical and technological and thereby increases in pollution. For this reason, industrial technologies have been developed for secondary materials recovery and recycling of components, which may prove costly and inefficient however.

This will include action on intelligent design of products, reuse and repair of products, recycling, sustainable consumption policy on waste, recycling rates, intelligent use of raw materials, development of stronger markets for secondary raw materials and domain specific measures. It might have been that those industrial products to be designed and constructed in compliance with the eco-design (eco-design). In conclusion, the technological development cannot be separated from eco-development, human development and the concept-design - build - use - recycling of products by a vision of eco-cyclical so in a word, sustainable development (sustainable).

Modern society needs to redesign products as a means of avoiding harmful incineration processes or other harmful waste disposal. [1]

Eco-management and eco-sustainable development are important keys to the success of a circular economy, which is why we propose a common approach. Thus, were

identified the general principles which are specific for industrial product eco-development.

In the industrial eco-design are identified and defined use and operating eco-products characteristics, as their life cycle, with positive results for the environment. It requires intense encouragement to designing products that favor lower use of resources, longer life span of products and facilitate their repair and recycling. The FIG. 1 shows the circular economy concept.

FIG. 1. The circular economy concept
(http://www.wrap.org.uk/content/wrap-and-circular-economy)

2. ECO-SUSTAINABILITY

Eco-sustainability is aimed, achieving a dynamic balance between human and social needs with the eco-system through a policy of stimulating human creativity in finding solutions to the serious problems of the contemporary world such as pollution, depletion natural resources, overpopulation, hunger, housing needs, the need for human self-realization and education.

The practical definition of sustainable development leads to new requirements imposed by socio-economic and ecological urban ecosystems, which adapt industrial cities through a process of adjustment and remodeling [2] geared towards improving the living conditions of a city called urban regeneration, in which housing policies play a critical role.

Sustainable development is development that aims to satisfy the needs of the present without compromising the ability of future generations to meet their own needs. Sustainable development allows reconciling economic and social progress without harming the natural balance of the planet.
The concept of sustainable development has emerged as a solution to the ecological crisis caused by intense industrial exploitation of resources and the continuous degradation of the environment and seeks primarily to preserve environmental quality. Today, the concept has spread, at least at the declarative level, the quality of life through wealth

distribution between developed and less developed countries, decent living population standards at risk in certain areas where the planet seems already suffocated by overexploitation natural resources, especially what is the way to create a healthy planet to future generations.

The eco-development concept was set by Maurice Strong in 1972 at the Stockholm Conference on the environment and human. It is considered a neo-Malthusian theories antidote to the pessimistic included in the World Conservation Strategy (SCM), the depletion of raw materials and energy resources and long-term sacrifices economies. This concept highlights the necessity to combine economics with eco-friendly by launching the idea of "economic development through environmental". This concept was reinforced by the 1992 Rio Conference through Agenda 21 document outlining practical lines of action in adopting a common strategy of the world to meet the requirements of eco-sustainable development.

The overall objective of eco-sustainable development is to find an optimum interaction between four systems: economic, human, environmental and technological. The optimal level corresponds to the long-term development that can be sustained by these four systems. For the model to be operational, its viability must support or apply to all subsystems that form the four dimensions of sustainable development, ie starting from the energy, agriculture, industry, and to investments, human settlements and biodiversity.

The environment is not confined to exploitable resources in any circumstances; It could be considered true milking cows for entrepreneurs, but offers multiple opportunities for investment and creating new jobs, source of income for every human. We need to bring back the human "on the agenda".

3. ECO-SUSTAINABILITY DEVELOPMENT AND THE CIRCULAR ECONOMY

The circular economy, promoted by the European Commission, involves increasing the life span of products or reduce the use of hazardous materials or difficult to recycle "When last year the European Commission launched generic package called" circular economy ", this launch marked another important step in trying to implement the desire" Resource efficient Europe in terms of resources". Why we did get here? Because natural resources that underpin the functioning of the European and global economy and ensure life quality are becoming less.

Unlike economic model characterized by "take-make-consume and dispose", "the circular economy" seeks to preserve the value of the materials and energy used in products as much as possible, minimizing the waste and resources use. The transition towards a circular economy in Europe will promote competitiveness, contribute to economic growth, create jobs and protect our environment.

It can also provide consumers with innovative more sustainable products, help them to save money and improve their quality of life. The environmental, economic and social dimensions of circular economy will go hand in hand. By my opinion, three main principles should be applied for the eco-design of a product:a multi-steps approach must be developed, i.e. a “life cycle thinking” must be adopted, which means that the different steps of the life cycle must be described (FIG. 2).

Starting with the industrial revolution the waste has constantly grown. This is because our used economies have a "take-make-consume and dispose" pattern of growth - the linear model assumes that that resources are abundant, available and cheap to dispose of.

We must ensure that products are designed to be repaired, reused, reprocessed and then recycled. European Union encourages the transition towards a circular economy and spur

private investment in the field. According with my view, the pillars of sustainable development in circular economy are shown in the FIG.3.

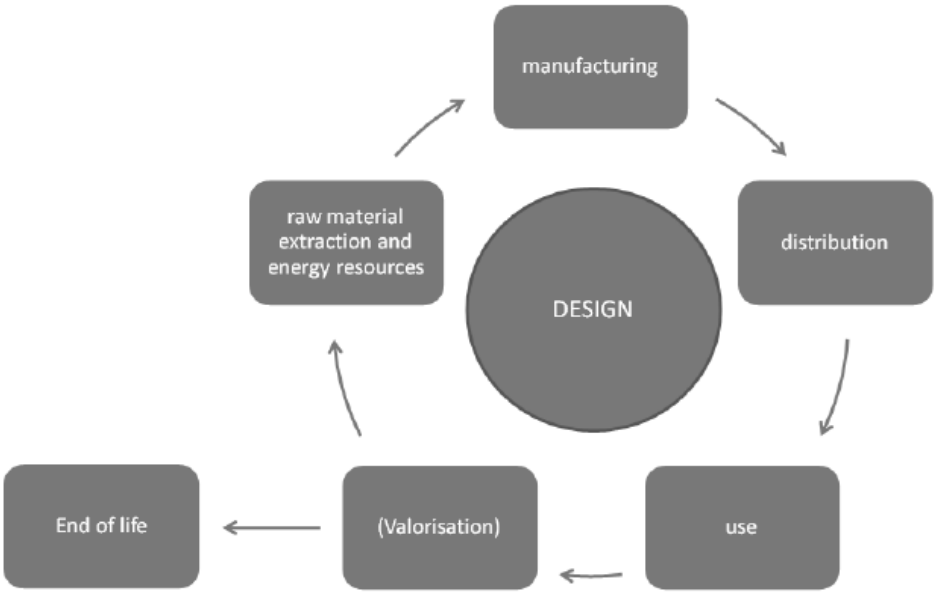

FIG. 2. Life Cycle Assessment for a design process[9],

With the market introduction of new technologies, some existing equipment to a certain extent becomes useless.

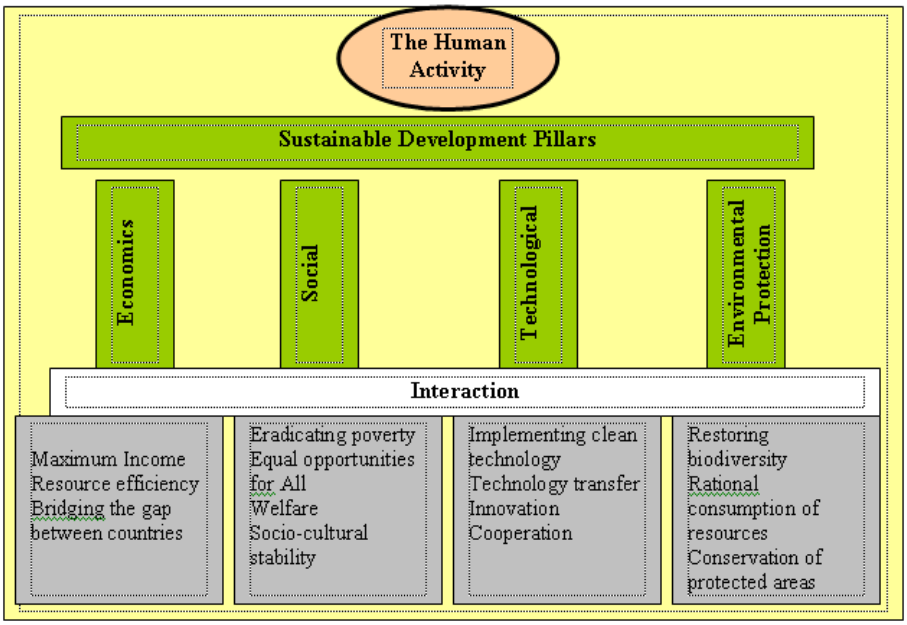

FIG.3 . The pillars of Sustainable Development in Circular Economy (realized by the author)

2. THE FUTURE AREAS OF CIRCULAR ECONOMY

In 2014, the Ellen MacArthur Foundation and the World Economic Forum released a report contending that over US$1 trillion a year could be generated for the global economy by 2025 and 100,000 new jobs created within the next five years if companies focused on building circular supply chains to increase the rate of recycling, reuse and

remanufacture. Using the circular economy concepts, some companies will find new markets, moving from selling products towards services and develop business models based on leasing, sharing, repairing, upgrading or recycling products individual components. In this new approach it is estimated to result in numerous business opportunities for SMEs. The European Platform for resource efficiency [6] (EREP) identified several promising areas that may concern the companies, such as better information on the resources contained in a product and how it can be repaired and recycled, as well as new business models and principles for sustainable supply standards. In addition, "financial frameworks are needed to encourage new accounting and resource efficiency and circularity, no wasteful consumption." To help institutional investors to invest more in circular economy, it has been analyzed the potential bond market, including for smaller projects and SMEs.

According with I. L. Popa ,N. V. Popa, [8], eco-design is the integration of environmental aspects in the design phase, taking into account the whole product life cycle from procurement of raw materials to product disposal. The authors have realized *Eco-design of electronic products according with Circular Economy Principles during Life Cycle* (FIG. 4).

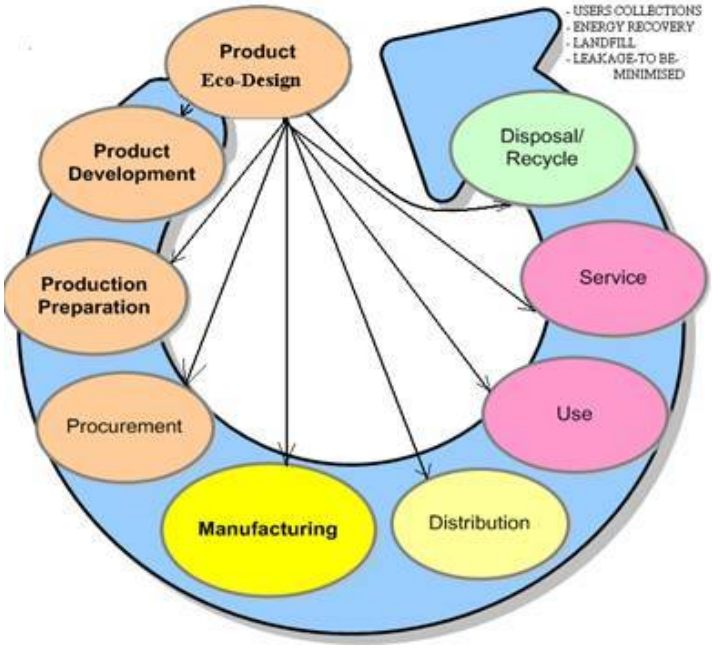

FIG. 4 . Eco-design of electronic products according with Circular Economy Principles during Life Cycle [8]

5. CONCLUSIONS

Low dependence on imports of strategic resources can be an explicit goal of circular economy, but European production consumers systems depend on imports and cannot operate in isolation. It is essential to understand the environmental pressures that occur along the value chain (these pressures will be felt critically) and how that transition towards a circular economy can influence these pressures.
Only then political efforts can be directed to resources and actors for the economic, social and environmental needs are greatest circular approach. The main categories of resources are relevant to the environment and human well-being are food, water, energy and materials (including chemicals), food systems, mobility and housing which creates pressures dominant.

Switching to circular economy is central to resource efficiency agenda, set by the Europe 2020 Strategy. The current linear economic model, in which we exploit, process, use and manufacture the resources, has no future. The circular economic model relies on reuse, repair, reprocessing and recycling of materials and products. The objective of such an economic model is to increase resource productivity and separating economic growth from resource consumption and environmental impact.

We have identified some solutions as following: applying existing legislation and effective implementation of fines stipulated by law for firms failure recovery target; defining the generator targets and immediate implementation of the legislation adopted to increase the storage fee; applying the principle of "pay as you throw"; rethinking public funding policies and interventions programs in an integrated environment.

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