Eco-Innovation and Service Activities in the Context of Sustainable Development in Romania

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Abstract

Eco-innovation and sustainability are two concepts that follow the same driving direction in the sense that it determines each other having as purpose a decrease of the impact way of production on the environment by increasing the resistance of nature to environmental pressures and, not least, by obtaining a use of natural resources in an efficient and responsible way.

The action of all stakeholders and all economic sectors in reducing aggression on the environment are increasingly asserting more stringent if there are taken into consideration the climate change or diminishing resources and biodiversity, eco-innovation being seen as an opportunity for businesses of any kind and with any object of activity.

Service activities can be the beneficiaries of eco-innovation through the emergence and development of high-tech services. But, need to be aware also of the role they play in the environmental protection, in this way exemplifying a small part of them, namely: services of research and development leading to products and innovative services, sanitation services, waste management services where ecology is already a brand presentation and we refer here to ecological tourism services, etc. All these issues can lead to increased quality of life and create new jobs, for which we intend to analyze how can influence healthy to each other two actual concepts namely service activities, innovation and ecology. We also follow to determine how eco-innovation can contribute to the development of innovative services and together can reduce the adverse environmental effects by promoting healthy development and a sustainable economy.

In order to achieve the objectives proposed, we analyzed the main literature on this subject and used descriptive statistical methods for interpreted the statistical data available in the official databases. The results of this study establish the relationship between eco-innovation, services, and sustainable development on the one hand, as to identify the place of Romania in the Eco-Innovation Scoreboard - Eco-IS in the European context and the exact

situation existing in Romania in relation to support services for the eco-innovation process, on the other hand.

Keywords: Innovation, eco-innovation, sustainable development, high-tech services, sustainable economy

Introduction

Innovation is a process by which advances achieved after an extensive process of research and development are put into practice and are obtained so the change of any product, service or process or an organizational change or marketing solution is designed to bring utility to those who will request.

We find into literature intense debates on issues that may separate the concept of invention to the concept of innovation. There are different opinions in the sense of differentiation or complete similarity of the two concepts. Thus, F. Malerba claims that the invention is a new idea, a new scientific discovery or technological innovation that was neither disseminated nor applied unlike innovation that involves a market able application of an invention that is integrated in the economic and social practice (Malerba, E., Orsenigo, L, 1997). In this manner, innovation is the result of the new ideas emergence, which was materialized.

Innovation is based on the use of previously acquired knowledge, on the results of new technologies, on technological development or new combinations of existing technology (Diaconu, M. 2011).

Schumpeter brings up the types of innovation that involves five categories namely: new products, new production methods, exploiting new markets, new ways to offer the market products, and new ways of organizing business (Schumpeter, J., 1934).

Remaining in the field of taxonomy, J. Schmookler (1966) found in his work the gap between "product technology" and "production technology" in terms of how to create or improve products, respectively, depending on their production.

The current trends of environmental protection, sustainability and competitiveness, has led to a new concept namely eco-innovation, which is a term rarely used in our country because there is an association between eco-innovation and a complex and very abstract scientific research. The reality says that certain forms of eco-innovation can be implemented in a simple way. Innovation must contribute to environmental performance and thus obtains eco-innovation connotations, something necessary given the current challenges faced by the climate change, energy security, and natural resources. Besides these aspects, any organization following this concept finds eco-innovation as a lever to increase its competitiveness in the goods and industrial services market.

The role of tertiary sector in any economy is well defined. Thus, any country who aspire to a rapid economic growth and join to global economy based on knowledge encourage the development of tertiary economic sector as a determinant factor of national competitiveness. (Zamfir, B. Rabontu, C, 2015)

The term of eco-innovation is relatively new. The first used in 1996 by the authors C. Fussler and P. James (in the paper *Driving Eco-Innovation*) by reference to new products and processes which provide value to customers and businesses, while significantly decreasing the environmental impact, showing a similar significance the "environmental innovation", the "innovation for sustainable development" or the "sustainable innovation".

Making analogy with innovation, we can say that the eco-innovation means the "modification of any product, service, process, organizational change, or marketing solution that helps reduce resource utilization and reduce the release of toxic substances throughout the life cycle" (www.eco-innovation.eu).

In 2009, OECD defined eco-innovation as "the implementation of new, or significantly Improved, products (goods or services), Processes, Marketing Methods, Organisational structures and institutional Arrangements Which, With or Without intent, lead to Environmental Improvements compared to relevant alternatives " (OECD, 2009).

It is found in the specialty literature that eco-innovation can differentiate depending on the degree of novelty but also on the impact that eco-innovation has on existing products, processes or technologies used. In this respect, K. Smith in 2009, in his paper "Climate Change and Radical Energy Innovation: The Policy Issues" divided eco-innovation into three major categories, namely:

- *Incremental* innovations occur by modifying existing technology to raise the efficiency of resource and energy use, without fundamentally changing the underlying core technologies or system architecture.
- *Disruptive* innovations consist of changing how things are done or specific technological functions are fulfilled, without necessarily changing the underlying technological regime itself. Disruptive innovations typically, though not exclusively, take the form of changes in organisational practices or business models.
- *Radical* innovations occur when an entirely new solution is created and leads to a full-scale shift in the technological regime at the time.

"Eco-innovation is the introduction of any product (good or service), process, organizational modification or marketing solution to help reduce the use of natural resources (including materials, energy, water and land) and allows reducing the release of hazardous substances along the entire life cycle." [European Monitoring Centre for Eco-innovation]

Kemp, R. and P. Pearson (2008) in the paper “Measuring eco-innovation” (MEI Project Final Report), Maastricht: UNU-MERIT (The United Nations University - Maastricht Economic and Social Research Institute on Innovation and Technology) defined eco-innovation thus: "Eco-innovation is the protection, assimilation or exploitation of a product, production process, service management or business method new to the organization (their development or adoption) that, during its cycle life, has as result reducing the risk to the environment, pollution and other negative effects of the use of resources (including energy use) compared to relevant alternatives".

In the report by ECOPartner entitled “An overview of the conditions, challenges, and opportunities for eco-innovation in Romania” is found the definition that "Eco-innovation is the development and application of a business model built on a new business strategy that includes sustainability in all business operations, based on life cycle thinking in cooperation with partners in the value chain. It involves a coordinated set of changes or new solutions for products (goods/services), processes, marketing and organizational structure, leading to increased company performance and competitiveness." [UNEP & DTU: Manual Eco-innovation]

The definitions of this concept are numerous, some of them being very concrete. In this category falls also the one filed by Viorel Dan in 2013, namely: „the eco-innovation means all forms of innovation - technological and non-technological - which seeks significant and arguable progress towards sustainable development, through reducing environmental impact, improving resistance to environmental pressures or by using more efficient and responsible use of natural resources. Eco-innovation is closely linked to how natural resources are used, how it is produced and consumed, and also the concepts of "eco-efficiency" and "eco-industry" ” (Dan, V., 2013).

In the report by ECOPartner entitled “An overview of the conditions, challenges and opportunities for eco-innovation in Romania” is found the definition that eco-innovation can be analysed using the following four categories:

• Input measures: Research and development (R&D) expenditures, R&D personnel, and innovation expenditures (including investment in intangibles such as design expenditures and software and marketing costs);

• Intermediate output measures: the number of patents; numbers and types of scientific publications, etc;

• Direct output measures: the number of innovations, descriptions of individual innovations, data on sales of new products, etc;

• Indirect impact measures derived from aggregate data: changes in resource efficiency and productivity using decomposition analysis (Kemp, 2009).

In addition, eco-innovation is a key element of innovation that opens new paths to achieving sustainable economic activities[13] and here we refer to the four areas of action: economy, environment, society, and politics.

If in the economy through eco-innovation can be achieved cost-reduction materials and energy, new products, new services, new markets but also new business models, in terms of environment can discuss the sustainable management of natural resources, recovery climate change and improving biodiversity and ecosystems.

Eco-innovation has positive effects also in terms of society in contributing to enhancing the quality of life and especially the creation of new jobs and sustainable aspects that can be powerfully sustained also by the policy of security aspects of materials or correctness in resource allocation.

The innovative services represent a new concept of services, significantly improved compared to the traditional concept of services, it is increasingly common in practice. Innovations in services have the potential to change profoundly innovative aspects in other sectors and to support the company's growth. Successful services firms manage to remain competitive through innovation, because no the manner in which a service is designed and delivered has a impact on buying decision to the consumer, but also that innovative element retrieved from the respective service whereby it becomes vastly superior compared to the services offered by competing firms. (Rabontu C., Bălăcescu A, 2013)

Methods

In order to respond to the proposed goal, this paper is based on a large recent bibliography for identify and evaluate the opinions of the other authors who were concerned about this subject. The review of the bibliography was result-oriented. This means that, the results on the subject or on the related topics, were analyzed and presented in this paper. So, were targeted the most relevant aspects regarding the innovation, eco-innovation, its services, and its role in innovation and eco-innovation, the relationship between eco-innovation, green economy, and competitiveness. All this was useful to support us in establishing the actual state of the subject using statistical data.

The relationship between Eco-innovation, green economy, and competitivity

The sustainable development is a concept quite used lately that attracts the attention of all and beginning to take shape through the multitude of measures taken by market participants even through eco-innovation that aims to obtain products and sustainable services through sustainable technologies.

[13] http://www.cnpcd.ro/application/media/upload/user/files/PPT_ecoinovarea%20.pdf

The environmental benefits through innovation and therefore through eco-innovation, have in the foreground reducing resource consumption and / or emissions of pollutants and thereby avoid the destruction or damage the environment. A protected environment leads to a quality of life life higher if not at least at current levels, determines access to natural resources for future generations and also to preserving intergenerational economic potential.

It also should not be overlooked that between sectors there are close links that reflects a sustainable economic development in the sense that once made products and processes conform to sustainable development it will be find also in other areas which in turn will be environmentally friendly.

Thus, once eco-innovation implemented we will speak in the moment zero, in which the idea is born and is implemented, yielding a product or process environment, about a healthy development.

The unprecedented development of society as a whole through new discoveries of social-economic and technological progress, makes imperative maintaining environmental quality, namely protecting the natural and man-made environmental. From these viewpoints, service activities contribute in a significant and intensive way meant to protect the environment. The relationship between services and environment takes into account, on the one hand, the role of services to protect the natural environment, and on the other hand, to prevent and combat multiple possibilities for its degradation. This requires the development of services such as geological knowledge services, inventory and protection of natural resources, water management services and hydropower, removals and disposal of toxic waste, etc. All this must be combined with the increasing role of educational services to foster care and responsibility towards the environment, public environmental education.

Maintaining prosperity and a high quality of life in Europe depends critically both on the clean and healthy environment, and the strength and competitiveness of the economy.

The ecological solutions will attract a new generation of manufacturing industries and high-tech services, will enhance Europe's competitiveness, and create highly skilled jobs. Moreover, Europe focuses on stimulating demand for innovation by acting in this context through Eco-innovation Action Plan (EcoAP) proposed by the European Commission as a commitment in the flagship initiative "Innovation Union", part of the Europe 2020 Strategy. The EcoAP mainly aproaches the blockages, challenges and opportunities for achieving environmental objectives through innovation.

In the studies lately conducted in reference to innovation it is reflected entitled arguing for that innovation and implicitly eco-innovation has become the driving force for global competitiveness. Thus some authors (Enache, E. Morozan, C. 2013) consider that without innovation there is no success in history, and the vulnerability to globalization and crisis (resources, population,

etc.) increases. It is even alleged loss of identity issues of countries that do not invest in innovation, being easily absorbed by others.

The European Union concerns to the rank of priority the concerted action of all Member States including Romania to transform EU into a smart economy, sustainable and favorable to inclusion, to build a knowledge-based structure, protected environment, cooperation among peoples. All this can be strongly sustained by eco-innovation and green economy that lead to competitiveness.

In the EU and implicitly in Romania, eco-innovation is considered as one of the determining factors of economy and competitiveness, even considered the engine of global recovery. In order to encourage this new and beneficial concept, but also for its implementation, were formulated a series of thematic objectives among which include: measures to encourage savings by low-carbon, environmental protection, efficient use of resources, susteainable transport and developing a circular economy.

These are closely related to efforts to promote appropriate investments to stimulate economic growth and create jobs. A definition of the EU authorities on this concept says "Eco-innovation includes any innovation that reduces the use of natural resources and decreases the percentage of harmful substances released into the entire life cycle. Eco-innovation is found in all kinds of products, services and marketing methods, new or significantly improved organizational structures"[14].

The importance of this new area has not left unanswered and over 240 projects funded under the scheme for eco-innovation are already underway in areas such as materials recycling, water, materials for sustainable construction, green businesses and food and beverages.

In the current economic crisis and of a society faced with the pressing need to save, the world assist in the business world at a new wave of trends, along with a series of radical mentality changes of the population; the environmental affairs, also known as "green business" represent one of the new trends in the business arena (Pelea, C.I., 2011).

Green business has more definitions, one of them being promoted by Cooney in 2009 who states that „a business can be classified as "green business" if it complies and simultaneously supports policies to protect people's rights and the environment, while bringing profit to the entrepreneur". Business motivation for eco-innovation, for green business is now widely accepted[15] because:

- The green market worth trillions of dollars
- The retailers require that providers respond to 'green' consumers

[14] http://ec.europa.eu/regional_policy/sources/docgener/panorama/pdf/mag47/mag47_ro.pdf
[15] Source: OECD Sustainable Manufacturing Toolkit, 2011

- A "green" reputation leads to financial value
- A small investment in "green" area can lead to big savings
- The new generation of workers cherishes sustainability and demands "green" jobs - 96% of young people want employers to be environmentally responsible

The effective economic development is a process of continuous modernization. Along their development, nations progress in terms of their competitive advantage and the specific ways of competition. Following Porter's model (2003), we can identify three stages of economic competitiveness. In the first stage, there is factors-based economy, in which the primary factors of production such as cheap labor and access to natural resources are the dominant sources of competitive advantage. The second stage is investment-based economy, where competitiveness is the result of increasing production efficiency and improving quality of goods and services produced. The third stage is innovation-based economy, where the ability to achieve innovative products and services to limit global technology using the most advanced methods becomes the dominant source of competitive advantage (Radu Gheorghiu, Dragoş Pîslaru, Geomina Ţurlea, 2004).

Romanian Eco-innovation in European context

The score or index of eco-innovation (The Eco-Innovation Scoreboard - Eco-IS) is an indicator that can provide us a more accurate performance measurement through eco-innovation in Romania compared to EU countries. This score uses 16 indicators grouped into five thematic areas, namely:

1. The eco-innovation inputs are calculated based on three indicators:

• Government investment in research and development on environmental protection and energy segment (expressed in% of GDP);

• Green investment in early stages (USD / capita);

• Total number of research and development personnel and researchers involved (% of total employment level of labor).

2. Eco-innovation activities are calculated based on three indicators:

• Implementing innovation activities to reduce material inputs per unit of output (product or service) in enterprises (percentage of total firms);

• Implementing innovation activities to reduce energy inputs per unit of output (product or service) in enterprises (percentage of total firms);

• Companies with certified environmental management systems (ISO 14001) (per million inhabitants).

3. The eco-innovation outputs are based on three indicators, namely:

• Patents associated to eco-innovation (per million inhabitants);

• Academic Publications on Eco-Innovation (per million inhabitants);

• Covering the theme of "eco-innovation" in digital media (per number of digital news agencies).

4. The outcomes of resource efficiency is one of the five areas of Eco-innovation score and are calculated based on four indicators:

• Productivity on material consumption (GDP / national consumption of materials);

• Energy Productivity (GDP / capita gross national energy consumption);

• Water Productivity (GDP / water footprint);

• The greenhouse intensity of greenhouse gas emissions (equivalent CO2 / GDP).

5. The socio-economic outcomes are calculated based on three indicators:

• Exports of products from eco-industries (percentage of total exports);

• Employment in eco-industries (percentage of the total workforce of all companies);

• Turnover of eco-industries (percentage of total GDP).

Based on these indicators index was calculated the eco-innovation index on the Member States of the EU level including Romania. We present these data in detail on components of the eco-innovation index in 2010-2015 to determine the degree to which Romania is aligned or that can compare with countries where eco-innovation is valued at its fair value.

Table no.1. The Eco-Innovation Scoreboard in 2010-2015

	2010	2011	2012	2013	2014	2015
EU27	100	100	100	0		
EU28				100	100	100
Austria	131	125	112	106	106	108
Belgium	114	115	118	101	96	97
Bulgaria	58	67	80	38	49	49
Croatia	0	0	0	57	87	67
Cyprus	64	71	74	43	59	60
Czech Republic	73	91	90	71	92	99
Denmark	155	138	136	129	185	167
Estonia	56	74	78	72	74	80
Finland	156	149	150	138	135	140
France	96	99	96	108	112	115
Germany	139	123	120	132	134	129
Greece	55	59	67	66	72	72
Hungary	70	83	73	61	79	81
Ireland	101	118	113	95	136	134
Italy	98	90	92	95	99	106
Latvia	60	77	71	52	72	75
Lithuania	45	52	53	66	71	73
Luxembourg	94	130	108	109	188	124
Malta	66	82	72	67	57	64
Netherlands	110	109	111	91	96	98
Poland	54	50	54	42	63	59
Portugal	72	81	84	79	99	102
Romania	52	67	78	63	76	82
Slovakia	48	52	54	47	68	72

Slovenia	75	109	115	74	91	96
Spain	101	128	118	110	107	106
Sweden	128	142	134	138	123	124
United Kingdom	103	105	101	122	100	106
Copyright Eco-Innovation Observatory, 2016						

Source:http://www.eco-innovation.eu/index.php?option=com_content&view=article&id=2&Itemid=34

Fom the data presented in Table 1 it is found that the index of eco-innovation is as greater as the economy is more developed and we refer here to Denmark, Finland, Sweden, Ireland, Luxembourg, France, Germany, Italy, Spain, countries which have a score above the European average, but decreasing in the last year of analysis, namely in 2015 in most of these countries. Countries whose index is below 100, among whom enroll also Romania have increases from one year to another, sign that they realized that eco-innovation is important to sustainable economic growth. Romania with a score of 82 in 2015 compared to 52 in 2010 stands well if we take into account that is ahead of older MEMBER countries of the EU, such as Slovakia, Poland, Greece, Croatia, Czech Republic, Hungary.

The increasing of eco score in Romania encourages us to believe that the sector is well positioned in the development strategies of the Romanian economy, which can be detailed by presenting the components that goes into quantifying this indicator.

Table no.2. The component elements of Eco-Innovation score in UE in 2015

2015	Eco-innovation inputs	Eco-innovation activities	Eco-innovation outputs	Resource efficiency outcomes	Socio-economic outcomes	Eco-innovation scorboard
Bulgaria	19	71	27	46	81	49
Poland	40	54	58	62	77	59
Cyprus	14	54	132	77	17	60
Malta	25	72	55	104	46	64
Croatia	21	100	89	80	49	67
Slovakia	38	101	52	78	87	72
Greece	57	37	101	78	61	72
Lithuania	43	94	59	81	87	73
Latvia	43	60	95	70	109	75
Estonia	78	129	53	48	100	80
Hungary	72	98	27	81	126	81
Romania	39	138	53	64	120	82
Slovenia	74	92	98	78	142	96
Belgium	89	116	111	98	71	97
Netherlands	66	77	106	124	108	98
Czech Republic	63	181	47	66	147	99
EU AVERAGE	100	100	100	100	100	100

Portugal	79	167	83	86	99	102
United Kingdom	126	116	74	126	87	106
Italy	75	118	117	116	101	106
Spain	94	134	102	112	105	106
Austria	98	126	136	107	73	108
France	111	110	108	108	138	115
Luxembourg	106	115	205	131	60	124
Sweden	121	154	160	102	93	124
Germany	154	162	140	107	87	129
Ireland	310	135	65	104	63	134
Finland	182	152	190	77	120	140
Denmark	368	71	157	108	86	167

Source: http://ec.europa.eu/environment/ecoap/scoreboard_en

Noted that, into the Romanian eco-innovation index, the eco-innovative activities have the highest share, followed by the socio-economic outcomes. In 2015, Romania has very modest inputs in eco-innovation system, with a score of 39 (vs. 23 in 2012) in the EU average of 100. With a lower score, it is only Croatia (21), Cyprus (14), Bulgaria (19), Malta (25), and Slovakia (38). In this respect, we consider allocations and government investment in research and development on environmental and energy very low as a share of GDP, representing a moderate value compared to trends in the EU. But also the employment in eco-innovation research sector, the number of employees in research and development in Romania being very low in total employment.

In relation to the eco-innovation activities, Romania has significant score, above the EU average, ie 138, resulted from national companies interests in standardization and certification of their environmental management. The ecological responsibility of Romanian companies is slightly higher than the EU average, given that the number of companies that have obtained ISO 14001 certification has increased significantly in recent years. A higher score than Romania have only Sweden, Czech Republic, Portugal, Germany, and Finland.

In the field of eco-innovation outputs, Romania is below average performance with an index of 53 lower than previous years (83 in 2012). Below this value stand Bulgaria, Hungary, and the Czech Republic.

Romania's performance in achieving outcomes on resource efficiency is modest to moderate, given that the economy is on average 40% less efficient than the EU. Materials and water productivity is lower than the EU average, while energy productivity and intensity of greenhouse gas emissions are approaching the EU average.

In eco-innovation area, the performance of Romania leads to socio-economic satisfactory results in 2015, much better than in previous years, partly reflecting lower values of input and oucomes of resources efficiency

and high values of eco-innovation outputs. The total score is 120, being after France, Slovenia and Czech Republic.

Services supporting the innovation process

The research and development services are the first of the services that support the process of invention, innovation, and eco-innovation, enjoying special attention from the developed countries that invest a significant percentage of GDP in these services. In European Union, the share of spending on research-development in GDP increased from 1.79% in 2000 to 2.01% in 2012. The economically developed countries stands more than European average, where are distinguished Sweden and Finland with 3.3% of GDP in 2013, with the largest share, followed by Denmark where the rate grew from 2.19 in 2000 to 3.06% in 2013. Significant share of GDP are found in Germany - 2.23, Slovenia - 2.59, Austria - 2.81 in 2013 from 1.93% in 2000, Belgia - 2.28. At the opposite pole lies developing countries, where the lowest share is found in Romania which in 2013 invested only 0.38%, lower than in previous years (2012 -0.48%). Bulgary invested 0.65% of GDP in 2013 compared to 0.49% in 2000, and Croatia, Slovakia and Greece 0.8% each.

Below is the evolution of research-development expenditure ratio in Romania in the 2000-2014 period.

Table No.3. Total expenditure on research and development in Romania (*R&D expenditure as GDP percentage)*

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Total	0,37	0,39	0,38	0,39	0,39	0,41	0,45	0,52	0,57	0,46	0,45	0,49	0,48	0,39	0.38[1)]

Source: http://www.insse.ro/cms/files/Web_IDD_BD_ro/index.htm

It appears that in 2007-2008 was achieved an increase in the percentage issue that was found in the economic boom in this period, then decrease reappeared reaching in 2014 to 0.38%. As a result of this issue and not only, interposing here aspects related to the lack of facilities offered by the state that could encourage businesses to innovate, we introduce further data on the share of turnover derived from innovation sectors.

Table No.4. The turnover from innovation as % of total turnover, on economic sectors in Romania

	2002	2004	2006	2008	2010	2012
Total	9,4	16,6	18,5	14,9	14,3	3,7
Industry	11,2	20,0	21,9	20,0	21,4	5,4
Services	6,8	11,7	15,3	10,3	6,5	1,6

Source: http://www.insse.ro/cms/files/Web_IDD_BD_ro/index.htm

An encouraging growth recorded until 2008, the maximum being reached in 2006, namely 18.5% compared to 9.4% in 2002. In 2012, the last

year for which we have official data, reveals a very small share. It is noticed that the largest share in turnover of innovation has industry compared to services which in 2006 registered 15.2% and in 2012 only 1.6%.

In 2010-2012, among the enterprises in the business area, the share of enterprises that have introduced or implemented new products, processes, organizational methods or methods of marketing, new or significantly improved it was 20.7%, down with 10, 1% percentage points from 2008-2010. Among them, 14.4% were companies that applied only new ways of organizing and marketing while 1.9% were companies that have introduced or implemented only new or significantly improved products and / or processes. A share of 4.4% of companies have introduced products and / or processes and new or significantly improved methods of organizing and / or marketing.[16]

According to data presented by the INS in the period 2012-2014, the share of enterprises that have introduced or implemented new products, processes, organizational methods or methods of marketing, new or significantly improved was 12.8%, down with 7.9 points percentage of 2010-2012. In terms of innovative potential of business shows that the industrial sector has declined by 9.8 percentage points, from 22.4% in 2010-2012 to 12.6% in 2012-2014. In the service sector, the decline is lower by 5.7 percentage points, from 18.8% in 2010-2012 to 13.1% in 2012-2014[17].

Interesting to be presented is the number of R & D units in Romania, on public and private sectors.

Table No.5. The number of units with research development activity, on performance sectors, at the end of the year, in Romania

Performance sectors	Years			
	2011	2012	Year 2013	Year 2014
Total, from which:	1166	970	920	773
public sector	268	269	273	286
- gouvernamental sector	177	174	186	192
- academic sector	91	95	87	94
privat sector	898	701	647	487
- business sector	884	683	623	460
- nonprofit private sector	14	18	24	27

Source: http://statistici.insse.ro/shop/

It appears that the total number of research units in 2014 fell from 1166 to 773 units compared to 2011. Increases were registered in the public sector but a timid growth, both in the government sector and higher education sector. The non-profit sector cheers up, the number of units being in a continuous growth here, even if they are still insufficient, being those units that can

[16] INS - Press releases, www.insse.ro
[17] http://www.insse.ro/cms/sites/default/files/com_presa/com_pdf/inovatie_afaceri15r.pdf

contribute selflessly to the development of innovative and sustainable economy.

In defiance of sustainable development, we present the Romanian imports from developing world countries, which do not use as intense eco-innovation and innovation as developed countries, those imports making a disadvantage for the stage of implementing the principles of sustainable development in Romania.

Table No. 6. The Romanian imports from developing countries in 2012 -2014 period
thousands Euro

The name of the country	2012	2013	2014	The name of the country	2012	2013	2014
Total imports from developing countries, from which:	8662 350,7	9439 849,0	9684 739,4	Total imports from developing countries, from which:	8662 350,7	9439 849,0	9684 739,4
ALBANY	3197,8	2316,5	26,6	JORDAN	2734,3	2753,6	5448,0
ALGERIA	658,2	1046,6	6085,4	KENYA	2135,0	2872,2	5573,1
AZERBAIJAN	3836 2,8	6916 8,7	496,2	KIRGHIZ STAN	514,2	443,9	548,9
ARGENTINA	1057 65,3	4458 0,1	1141 37,9	MALAEZI A	8192 4,8	8708 3,6	7799 1,3
BANGLADESH	1215 4,1	1574 6,8	1456 7,5	MAURIT ANIA	360,8	43,4	65,1
ARMENIA	52,9	482,0	64,0	MAURITI US	3762,1	1827,1	1785,4
BOLIVIA	3985,3	786,3	1291 2,1	MEXICA N STATES	1101 29,2	1401 01,4	1055 63,8
BOSNIA HERZEGOVINA	5789 2,0	5474 9,8	4762 0,1	MONGOL IA	119,4	121,0	62,8
BRASIL	3263 52,4	3564 50,2	2289 42,1	MOLDOV A	3253 33,6	3531 97,4	3733 39,7
MYANMAR	122,5	423,9	99,1	MAROC	9198 1,2	8381 8,3	1119 01,6
BELARUS	6813 2,2	7742 1,4	7146 3,0	MOZAMB IC	2313,1	1607,3	1426 0,3
CAMBODGIA	1751 7,2	2663,4	3211,3	NICARA GUA	1669 4,8	30,8	172,0
CAMERUN	556,2	1568,6	365,6	PAKISTA N	1849 1,4	2241 5,1	2004 0,6
SRI-LANKA	4307,4	4878,3	6215,2	PANAMA	1340,4	698,6	0,5
CHILE	3635,0	1919,4	9001,6	PAPUA-NEW GUINEA	151,0	90,9	29,5
CHINA	1968 639,9	2093 648,8	2348 507,2	PARAGU AY	98,2	56,2	1445 2,2

COLUMBIA	7787,3	7447,8	10114,1	PERU	1845,9	3456,1	2295,5
DEMOCRATIC REPUBLIC OF THE CONGO	368,2	380,2	383,7	PHILIPPINE	14194,2	13482,9	13944,8
COSTA RICA	927,9	2111,5	1044,9	SIERRA LEONE	19290,9	24263,2	41388,3
CUBA	897,5	26254,6	429,8	VIETNAM	61178,5	81564,7	66635,2
DOMINICAN REPUBLIC	182,9	208,2	427,3	SOUTH AFRICA	31973,3	38944,1	33971,4
ECUADOR	2976,8	5951,0	5273,6	ZIMBABWE	6506,5	55064,7	23047,0
ETHIOPIA	3007,9	3359,3	2199,8	SUDAN	17,7	14647,5	9170,8
GRUZIA(GEORGIA)	1218,8	6737,0	3481,5	SWAZILAND	17599,5	26600,9	21135,4
GHANA	100,4	19,5	12,1	SYRIA	1209,2	1932,3	6689,9
GUATEMALA	578,0	1335,9	480,2	THAILANDA	126756,3	102051,3	131578,4
GUINEA	18735,1	22424,4	1740,7	TUNISIA	64747,1	69992,0	45485,1
HONDURAS	786,8	1474,7	594,4	TURCIA	1869177,9	1841734,8	1948737,3
INDIA	306487,1	367070,7	223705,9	TURKMENISTAN	2790,0	3051,9	15927,5
INDONESIA	74502,9	97409,4	93084,4	UGANDA	5375,2	5567,7	6449,3
IRAN	4646,2	13788,0	4988,5	UKRAINE	457506,3	501111,7	457276,4
IRAK	39465,2	45404,9	14561,6	REPUBLIC OF MACEDONIA	69842,4	41765,5	76740,7
COTE D'IVOIRE	6784,3	11195,9	8813,4	EGYPT	50982,2	35904,4	76512,9
JAMAICA	19899,5	2,0	7733,7	TANZANIA	4148,7	3814,1	6678,7
KAZAHSTAN	1786323,5	2276458,1	2288433,3	URUGUAY	3354,5	4250,0	3675,4
SERBIA	270287,8	225752,2	347586,7	UZBEKISTAN	1494,1	3433,8	1126,6
MONTENEGRO	906,9	3124,8	504,1	VENEZUELA	2879,5	1421,3	2199,2
KOSOVO	532,7	4798,6	588,0				

Source: http://www.insse.ro/cms/files/Web_IDD_BD_ro/index.htm

It is noted that Romania imported in significant amounts of total imports from countries that do not focus on sustainable development and eco-innovation. Romania's most important imports are found in trade relations with China from where we import 22% of the total amount, but also with Turkey where the share is 20%. We must not neglect the imports from less

developed countries where derives share of 4.7% in Ukraine, 3.7% in Brazil and other countries such as Guinea, Kazakhstan, Vietnam, Zimbabwe, Tanzania, Indonesia, etc.

In Romania there are organizations, entities that can provide eco-innovation and can create models of collaboration and support for business and policy makers. These units through their expertise but also through the system of relationships and partnerships can stimulate eco-innovation in the Romanian companies to adopt approaches and can establish a strong approach in order to promote eco-innovation.

First we must appeal to educational services where there is improved the understanding of eco-innovation and are creating new skills among experts that will support businesses to apply and promote mechanisms and policies that will promote eco-innovation. Another service-support of eco-innovation is the access to information.

For eco-innovation is a need for a range of support services such as access to information; training and capacity building; research and education; specialized services (assessment, energy efficiency, material efficiency, ecodesign).

The technical and legal consultancy services are services that every entity needs, any individual may be interested in such a field goal. Waste management is another type of service activities that can contribute to sustainable development through eco-innovation. Eco-innovation is a concept that can contribute to the emergence and development of services such as ecotourism, ecology services, sightseeing tours, creative tourism, etc.

Conclusion

From the foregoing, the first conclusion that we withdraw is that for a sustainable economic growth is extremely important to realize investments in new green technologies and eco-innovation. Even if Romania started on this path and shows some successes in the recent years, it is find on the last row in the rankings of EU on eco-innovation and especially among small and medium enterprises, given the fact that we are facing a lack of funds to support innovation and eco-innovation.

Eco-innovation can be obtained by increasing the competitiveness of green enterprises, including greening of existing industries, green innovation, and entrepreneurship. We are talking about environmental technologies successfully adapted for use in new areas; environmentally improved products and services; eco-initiatives related to efficiency of materials and improving waste management, innovative initiatives to increase efficiency in business operations; newly created 'green' jobs.

Romania must consider the example of developed countries that have succeeded in terms of eco-innovation and who share their national systems of

research and innovation well organized, funded and productive, but also a strong relationship of collaboration between the two sectors - public and private. Although was not identified a recipe generally valid for achieving performance in innovation and eco-innovation, what confirms that they can obtain such performance is the fact that countries like Finland, Sweden, Denmark and Germany, leaders in this field, are characterized by huge spendings in Research and Development, including businesses. The eight dimensions of innovation that must also consider Romania, namely human resources, finance and support and business investment, collaboration and entrepreneurship and intellectual capital vs innovators and economic effects and marketing their knowledge of technology are priority issues for those in leading places of the ranking leaders in innovation.

Eco-innovation can be achieved with maximum success in SMEs, aspect experienced in winning countries of eco-innovation, given the large number of companies in this category in from all countries. This requires all companies to move towards sustainable development and SMEs benefit from accurate information on environmental impacts and risks, on posible benefits of environmental management of eco-innovation and the approach focused on cycle life etc.

Eco-innovation is considered to be urgently required to avert the serious effects that may arise in the future, to response to major challenges - today and tomorrow - on the environment and its protection, while helping and finding evidence to contribute to the correlation fair and healthy relationship between the standard of living to which we are accustomed and created pressures on the environment.

Between eco-innovation and services, there is a double bond, namely: services may be the support for eco-innovation and eco-innovation in return can contribute to the development of existing services but also to the appearance of new ones.

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