Eco-Innovation Observatory

The Eco-Innovation Observatory functions as a platform for the structured collection and analysis of an extensive range of eco-innovation information, gathered from across the European Union and key economic regions around the globe, providing a much-needed integrated information source on eco-innovation for companies and innovation service providers, as well as providing a solid decision-making basis for policy development.

The Observatory approaches eco-innovation as a persuasive phenomenon present in all economic sectors and therefore relevant for all types of innovation, defining eco-innovation as:

“Eco-innovation is any innovation that reduces the use of natural resources and decreases the release of harmful substances across the whole life-cycle”.

To find out more, visit www.eco-innovation.eu

Any views or opinions expressed in this report are solely those of the authors and do not necessarily reflect the position of the European Commission.
Eco-Innovation Observatory

Country Profile 2013: Bulgaria

Author: Todorka Dimitrova

Coordinator of the work package: Technopolis Group Belgium
A note to Readers

Any views or opinions expressed in this report are solely those of the authors and do not necessarily reflect the position of the European Union. A number of companies are presented as illustrative examples of eco-innovation in this report. The EIO does not endorse these companies and is not an exhaustive source of information on innovation at the company level.

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Summary

The main challenges for eco-innovation in Bulgaria are related to achieving high energy efficiency, increasing energy savings and developing renewable energy sources, each of which has a role in combatting climate change and ensuring energy security. Along with these, the country is also facing socio-economic and environmental challenges stemming from the financial and economic crisis, poverty and high unemployment, and poor state of the environment, etc.

Despite efforts made in recent years by national authorities to improve the legislative framework in the country – aimed at promoting innovation and eco-innovation – Bulgaria still lags behind and continues to be among the countries referred to as modest innovators. In 2013, Bulgaria occupied last place in the eco-innovation ranking of the EU member states. The analysis of Bulgaria’s eco-innovation performance showed a lack of balance in the nation’s innovation system with a high number of scientists and engineers and a low level of governmental and investor support.

There is a certain demand for "green" products and services, which is an incentive for businesses, public bodies and educational facilities to invest in their production and introduction. To meet the demand for "greening" and energy efficiency local stakeholders are taking advantage of funding options by the Energy Efficiency and Renewable Sources Fund, which offers credits with below market interest rates and credit guarantees in the field of energy efficiency. Another emphasis in eco-innovation in the past year the focus on sectors that have been identified with potential for growth and conducting cluster policy, aimed at regional distribution and regional specialization of these sectors.

The barriers were of an economic, technical, financial, environmental, administrative and socio-cultural nature and hinder advancement of eco-innovation in the country. With regard to the drivers, the most significant were: a favourable regulatory and policy framework in recent years, high skilled human resource and knowledge capital, market demand for new green products and technologies.

1 | Introduction

The main challenges for eco-innovation in Bulgaria are related to achieving high energy efficiency (EE) and increasing energy savings and developing the sector of renewable energy sources (RES). In this direction, Bulgaria has set ambitious target: a 50% reduction in energy intensity of gross domestic product (GDP) by 2020, resulting in approximately 25% improved energy efficiency.

Some of the main issues related to improving energy efficiency and using energy from renewable sources in the industry include:

- Outdated energy infrastructure that generates significant losses in the transmission and distribution of energy;
- Poor energy management;
- Outdated equipment and technologies used by enterprises;
- Enterprises’ lack of interest for the use of innovative green technologies;
- Insufficient awareness of stakeholders (business, government and local authorities, and potential investors) about the benefits of renewable energy;
- Unawareness of small and medium-sized enterprises (SMEs) for the different procedures for applying for funding;
- Limited access to finance for renovation and modernization of the machinery of Bulgarian enterprises (lack of own resources, inability to attract external resources - different forms of credit);
- Lack of capacity and difficulties in developing eligible projects to apply for EU funding.

Other problems and challenges in the country which are of socio-economic and environmental nature relate to:

- The financial and economic crisis;
- Poverty and high unemployment, especially among young people;
- Poor state of the environment and quality of life;
- Overconsumption;
- Pressure on natural resources;
- Lack of technological and environmental innovations;
- High energy intensity;
- Ecological credit crunch.
2 | Eco-innovation performance

The analysis in this section is based on the EU 28 Eco-innovation scoreboard (Eco-IS) for the year 2013. Eco-IS via its composite Eco-innovation index demonstrates the eco-innovation performance of a country compared with the EU average and with the EU top performers. Eco-IS is based on 16 indicators which are aggregated into five components: eco-innovation inputs, eco-innovation activities and eco-innovation outputs as well as environmental outcomes and socio-economic outcomes.

Figure 2.1 EU28 Eco-innovation scoreboard 2013, composite index

Source: EIO, 2013

Despite the efforts made in recent years by the Bulgarian government and parliament to improve the legislative framework in the country and to promote innovation and eco-innovation, Bulgaria still lags behind in this respect. According to the latest survey of the Innovation Union (2013) and 2013 Eco-Innovation Scoreboard (Eco-IS) results, Bulgaria continues to be among the countries referred to as modest innovators and occupies the last place in the eco-innovation ranking of EU member states.

As shown in Figure 2.1, for the year 2013 the Eco-IS composite EI Index demonstrates that Bulgaria has the weakest eco-innovation performance compared to the EU average and the EU top performers, Sweden and Finland.

Bulgaria's performance is based on the five components of the index: eco-innovation inputs, eco-innovation activities, eco-innovation outputs, environmental outcomes and socio-economic outcomes, is shown in Figure 2.2.
The component Eco-innovation input consists of aggregated figures of three indicators: “Governments environmental and energy R&D appropriations and outlays” (Share of GDP) with a value of 7, "Total R&D personnel and researchers" (Share of total employment) with a value of 47 and “Total value of green early stage investments” (USD/cap) with a 0 value. The Input component's value of 18 positions the country along with Poland, just before Cyprus in the line of EU countries.

The component Eco-innovation activities with its value of 56, positioned Bulgaria before Greece (28), Cyprus (41), Poland (42), Latvia (44) and Malta (54). Compared to the other components, the better positioning of the country here is due to the relatively high value of the indicator “ISO 14001 registered organisations” (per mln pop) – 91, which is close to the EU 28 average of 100. The other two indicators of this component – “Firms having implemented innovation activities aiming at a reduction of material input per unit output” (% of total firms) and “Firms having implemented innovation activities aiming at a reduction of material input per unit output” (% of total firms) show relatively low values - 37 and 40 respectively, thus not contributing for better positioning of Bulgaria within this component.

The component Eco-innovation output also consists of the aggregated figures of three indicators: “Eco-innovation related patents” (per mln pop), “Eco-innovation related publications” (per mln pop), and “Eco-innovation related media coverage” (per number of electronic media). Their respective values are 3, 14 and 122. Because of the higher value of the last indicator, 22 points above the EU average, based on the Eco-innovation output component alone, the country moves up the line and positions before the Czech Republic, the Slovak Republic and Malta. The indicator "Eco-innovation related media coverage" (per number of electronic media) in 2013 is with 22 points over the average for the EU due to relatively large number of electronic media sources in the country.

The component Resource efficiency outcomes is an aggregated figure of the numbers of four indicators: “Material productivity” (GDP/Domestic Material Consumption, €/kg), “Water productivity” (GDP/Water Footprint, €/m³), “Energy productivity” (GDP/gross inland energy consumption, €/toe), and GHG emissions intensity (CO2e/GDP). According to this component, the country is ranged as last among the EU 28 due to the low value of the single indicators. Among them, the “Water productivity” holds the lowest value – 29 which compared to the EU average of 100 lags largely behind the leaders in the group, United Kingdom and Ireland with a value of 140.
Based on the fifth component Socio-economic outcomes, Bulgaria is ranged in the same position as Greece. The component's value is 22, which places the country before Cyprus, Croatia, Latvia and Slovakia. Within this component, the indicator "Employment in eco-industries" (% of total employment across all companies) holds the highest value - 36, compared to the other two indicators in this group - "Exports of products from eco-industries" (% of total exports) with a value of 19 and "Turnover (revenue) in eco-industries" (% of total revenue across all companies) with its value of 13.

The analysis of the composite Eco-innovation index shows that Bulgaria has relative strengths in certain indicators within some components and concurrently weaknesses for the other indicators within those same components. This difference in the indicators' weight and share within the components displays a lack of balance in the nation’s innovation system. A specific example would be the "R&D personnel and researchers" indicator, which is a strength within the EI Input Component and the “Governments appropriations & outlays” and “Green early stage investments” indicators which are weakness within the same component. The results of this component based on its indicators show high level of scientists and engineers with a low level of governmental and investor support.

3 | Selected eco-innovation areas and new trends

In 2013, new areas and trends in the development and promotion of eco-innovative activities emerge. The main challenge for promoting clean and resource-efficient industry production is the formation of public consciousness and culture on environmental issues through information campaigns and environmental education. The aim is to introduce sustainable patterns of behaviour promoting environmental conservation, energy and water resource conservation, renewable energy sources, recycling and more. There is a certain demand for "green" products and services, which is an incentive for businesses, public bodies and educational facilities to invest in their production and introduction.

To meet the demand for "greening" and energy efficiency, the Energy Efficiency and Renewable Sources Fund offers to Bulgarian companies, municipalities and private individuals financial tools such as credits with below market interest rates and partial credit guarantees in the field of energy efficiency. For FY 2013, there were 160 projects financed by the fund. The projects were applied for by municipalities, corporate clients, universities and hospitals and totalled a value of 64.8 mill. BGN. A description of each project with its respective results in electricity savings, thermal energy and GHG emissions reduction is available on the Fund's website.

Another emphasis in the field of eco-innovation in the past year was focusing on sectors that have been identified with potential for growth (such as mechatronics, ICT, transportation and logistics, agriculture and the food industry, creative industries, automobiles and components, and more) and conducting cluster policy aimed at regional distribution and regional specialisation of these sectors. Many of the clusters flourish well and serve as an example of successful growth and opportunities for innovative and eco-innovative products and processes. An example is the Cluster Electrical cars. This cluster represents some of the largest local companies and promotes cooperation with leading global companies. As a result of this cooperation, a successful prototype of the first Bulgarian charging column was designed, patented and prepared for mass production.

1 The Energy Efficiency and Renewable Sources Fund website is available on the following link http://www.bgeef.com/display.aspx
The so-called "Green" economic model is being introduced as fundamental to limiting the dependence on the energy system from imports of fossil fuels and reducing carbon emissions which cause climate change by improving energy efficiency and energy production from renewable energy sources. There is an increase in the number of proposed and patented eco-innovative products, including Internet-based platforms and sites which offer patents and innovative ideas to interested producers in the country and abroad. A good example is the design for roadside noise-protection walls made with photovoltaic panels which in addition to reducing noise also reduce energy consumption while ensuring proper road lighting and the safety of passing birds over the walls.

4 | Eco-innovation barriers and drivers in Bulgaria

Barriers to eco-innovation

There are certain economic, technological, financial, socio-cultural and other barriers that hinder the development of eco-innovation in the country.

Economic barriers to eco-innovation in the country relate to:
- Continued "brain drain", depopulation of some regions and an aging population;
- Limited access to finance and investment due to the financial crisis in the EU;
- Reduced market demand for eco-innovation, green products and technologies;
- Increase in the price of raw materials and equipment;

Part of the economic barriers in the country are related to barriers to GPP, whose potential so far has been used only partially. The most significant barriers to widespread implementation of this practice in the country are:
- A limited number of established environmental criteria for products and services;
- Insufficient information about the inherent cost of a product throughout its lifecycle and the respective cost of environmentally friendly products and services;
- Low level of awareness about the benefits of environmentally friendly products and services;
- Uncertainty about the legal conditions for the inclusion of environmental performance criteria in the tender documentation because of limited practice in this regard;
- Limited resources for implementation/promotion of green procurement and insufficient training of the work force administrating it;
- Lack of coordinated exchange of best practices and information between regional and local authorities.

Technological barriers:
- Outdated technological base and lack of modern infrastructure to support innovation and eco-innovation development in the country;
- Limited access and ability to develop and use technical and technological solutions by Bulgarian members in networks and consortia of EU funded knowledge transfer & cooperation projects;

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2 http://greenclicks.eu - Green clips is a web site which displays part of the Bulgarian experience in designing and building sites with zero pollution, making full use of the free renewable solar, wind and hydro energy as well as a number of proprietary solutions for effective synergistic exploitation of renewable energy sources.

• Limited governmental support (subsidies, grants, etc.) for innovation and R&D development;
• Difficulties created by state and local authorities during the practical implementation of legislation for the use of alternative and renewable energy sources and technologies.

Financial barriers:
• Limited access to specialised national funding schemes and subsidies for eco-innovative products and companies to implement eco-innovative technologies & processes;
• Lack of clusters and regional structures to support business in the development and market deployment of eco-innovative products;
• Lack of capacity for proposal development for funding which could absorb the relatively high percent of co-financing of approved projects and language barriers in local companies eligible to apply for European programmes in the field of eco-innovation.

Socio-cultural barriers:
• Poor awareness of the benefits of long-term investments in eco-innovation and energy-efficient products and technologies;
• Lack of tradition of public recognition of the merits of innovative and entrepreneurial managers and companies for economic development and job creation, especially in times of financial crisis.

Administrative barriers:
• Centralisation, on a ministerial level, of all functions related to assessment, management and monitoring of projects financed through the European structural funds and a lack of capacity in the state administration to adequately assess the effectiveness of innovative and eco-innovative projects, products and technologies and hence cutting the funding for such projects;
• Interpretation and application of financial correction mechanisms of the projects (including those in eco-innovation topic) supported by the EU funds have elements of subjectivity by monitoring experts in ministries. This leads to undue financial correction and denying beneficiaries of funding received. This creates negative attitude by SMEs that get discouraged to apply for EU funding.

Drivers of eco-innovation

Drivers for development of eco-innovation in the country relate to:

• Favorable regulatory and policy framework - there is an availability of supportive policies, programmes, legal systems, standards and norms, intellectual property rights, subsidies towards greening of the economy, creation of green jobs, green public procurement, etc.
• Human resource and knowledge capital - there are a large number of qualified scientists and engineers, creative entrepreneurs, relevant educational, training and R&D institutions.
• Technological - there are a number of technical universities with long scientific and training experience, many R&D centres in a variety of disciplines such as medicine, aqua and marine sciences, agriculture, etc. In some of the bigger cities, there are also new business centres and high-tech parks, a couple of innovative laboratories, innovation transfer centres, and industry specialised clusters which create demand for further development of innovation and eco-innovation.
• Economic - market demand for new green products and technologies due to the improvement in the quality of life and orientation towards a healthy lifestyle; demand for products with high added and ecological value for export to nation’s traditional markets - Middle East and CIS; demand for new jobs in the areas of green and blue economy; internationalization and globalisation of economy which post requirements for improvement of SMEs competitiveness, based on introduction of innovative & eco-innovative technologies, energy and resource efficiency.
• Cultural capital - change in consumer behavior on one side and risk taking by entrepreneurs on the other.
5 | Eco-innovation policy landscape

The most important eco-innovation policy measures and funding schemes in the country during the 2013 included the following:

- **Innovative Strategy for Smart Specialization of the Republic of Bulgaria 2014 – 2020**

The Strategy includes a separate section on the promotion of eco-innovation in Bulgaria until 2020 with a focus on developing the green economic model, investments for better water management, and Bulgaria’s climate change policy with two main aspects - reducing greenhouse gas emissions generated by different types of industries and activities for adaptation to existing or inevitable changes.

In particular, the specific objectives of the strategy for implementing sustainable patterns of production and consumption, consistent with the capacity and capability for restoring the ecosystems and not causing environmental degradation include:

1. Supporting the development of eco-innovation.
2. Supporting the development of "green" business in Bulgaria.
3. Encouraging sustainable patterns of production and consumption by introducing eco-innovation and eco-technologies.
4. Encouraging and promoting innovative technologies aimed at improving the protection and preservation of the environment.

- **National Action Plan for the Promotion of Green Public Procurement for the Period until 2014**

The purpose of the national plan is to identify the key measures and activities to be implemented in order for Green Public Procurement (GPP) to become a reality. The introduction of GPP practices can have an impact on trends in production and consumption. Demand from public authorities for "green" products can create or expand the markets for green products and services. This, in turn, would stimulate businesses to develop environmentally friendly technologies which produce products and services with a beneficial effect on the environment and on the economy as a whole.

- **Law on Employment Promotion.**

The trend for the development of "green" jobs both in the eco-industries and the "greening" of traditional industries continues. "Green" jobs are now listed in the Law on Employment Promotion. They are identified in economic activities related to the production of goods and provision services, which support environmental protection in accordance with a defined list of economic activities. On 21.12.2013, a Decision of the Council of Ministers adopted a National Action Plan for Employment 2014, which identifies specific measures for the reduction of unemployment, including the support for creating "green" jobs in sectors with growth potential.

- **Ordinance for Mandatory Use of Recycled Materials in Public Construction Projects from 2014**

As of 1 January 2014, the construction of buildings and roads using public funds mandates the need to integrate recycled building materials as required by the Ordinance for the management of construction waste and use of recycled construction materials promulgated in No. 89 of the State Gazette.

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4. The text of the Strategy is available on the following link
It is envisaged that by 2020 the amount of recycled materials used in the construction of buildings with public funds to gradually reach 2%, and in the construction of roads - 10%. In the construction and repair of other technical infrastructure, public entities and private vendors will be required to invest 8% recycled materials by 2020, and in the repair of roads - 3%. In backfilling, contractors will be required to use 12% of recycled construction waste by year 2020. It is envisaged that 80% of the construction waste generated by road construction and repair activities can be utilised.

As of mid-2013, all recycled materials that are placed on the market must meet the European requirements as well as the Bulgarian legislation pursuant to this ordinance. Also as of 1 January 2014, all entities awarding contracts for construction and repair activities will be obliged to prepare plans for the management of construction waste. Contractors will be required to sort waste by type as well as store and transport it to sites for its treatment and separate recycling. Contractors will also maintain a journal for the transportation and disposal of waste, and will account for the output and turnover of recycled building materials.

• Operational Programme "Innovations and Competitiveness 2014 - 2020"7

The Operational Programme "Innovations and Competitiveness" is implemented by the Ministry of Economy, Energy and Tourism. It was developed in 2013 as the one of the seven tactical documents at national level for the period 2014-2020, directed towards the implementation of the objectives and priorities of Europe 2020 Strategy. In its national aspect it complies with strategic priority 2: —Innovation and investment in smart growth, and strategic priority 3: —Connectivity and green economy for sustainable growth from the Partnership Agreement. The common goal of the programme is to assist the achievement of dynamic competitive development of the economy, based on innovations.

The operational programme has three priority axes:

1. Innovation and entrepreneurship
2. Competitiveness and resource efficiency
3. Financial instruments, which cover four thematic objectives of the Common Strategic Framework (CSF) of ESIF (technological development and innovation, SME competitiveness, low-carbon economy, environment and resource efficiency).

• BG161PO003-2.3.02 - The Energy Efficiency and Green Economy Programme 8

The Energy Efficiency and Green Economy Programme (the “Programme”) is a joint initiative between the Ministry of Economy, Energy and Tourism and the European Bank of Reconstruction and Development (EBRD) to promote sustainable energy solutions for SMEs. The programme started in 2013. The last deadline for submission of project proposal to the Contracting Authority was extended until 30 April 2014.

The objectives of the Programme are to:

• Improve the efficiency and productivity of environmentally friendly technologies utilised by SMEs.
• Reduce the energy intensity and adverse environmental impacts by promoting environmentally friendly, low waste and energy saving production technologies.

This new Programme is innovative because it combines the EU Structural Funds grants with commercial bank lending in one process. The grant component of the Programme is provided by MoEET as the Managing Authority from the Operational Programme “Development of the Competitiveness of the Bulgarian Economy 2007-2013” (OP Competitiveness). The loan

7 The last version of the Programme, dated 08.10.2013 is available at http://www.opcompetitiveness.bg/images/module3/1211_131008_OPIC_draft_fin_CKZ_clean_BG.pdf
8 Internet: http://www.beeciff.org/cms/en
component is managed by the EBRD and provided within the framework of the Bulgarian Energy Efficiency for Competitive Industry Finance Facility (BEECIF). Under this Financing Facility, credit lines are provided to local commercial banks (Participating Banks) to on-lend to SMEs.

- **BG 10 “Green Industry Innovation”**

Green Industry Innovation is one of the programme areas under the Norway Grants assistance for the financial period 2009-2014. Total contribution from Norway is more than EUR 11 million. This programme area is focusing on business development. Private sector is the primary target group. The overall objective of the Green Industry Innovation programme area is to increase the competitiveness of green enterprises, including greening of existing industries, green innovation and green entrepreneurship. The expected outcomes from this programme area are:

- Realisation of business opportunities of greening the European economy;
- Reduced production of waste and reduced emissions to air, water and ground;
- More use of environmentally friendly technologies - Increased green job creation and entrepreneurship.

“Greenest Companies in Bulgaria”\(^9\) and “BAPRA Bright Awards 2013”\(^11\) are examples of the several campaigns and competitions which have been organised in an effort to increase the visibility of and recognition for applied innovative and eco-innovative models, technologies and processes of public organisations and businesses in Bulgaria.

### 6 | Good practice examples

**Installation for biological treatment of green and biodegradable waste**\(^12\)

The installation is part of the Integrated System for Waste Management of the capital city Sofia and is financed primarily by the Operational Program “Environment 2007-2013”.

Its intended purpose is the treatment of biodegradable waste from parks and gardens as well as households and food-processing plants.

Total project value - 346 mill BGN, including EU grant - 291,5 mill. BGN. Structure of funding: EU grant 61,86%, state funding 10,92%, loan IMF 21,82%, local financing 5.4%

The installation’s recycling capacity is 44 tonnes annually: 24 tons bio-gradable waste from parks and gardens, and 20 tonnes of food and kitchen waste. The main technological processes include composting of green waste, anaerobic degradation, and storage and fine treatment of bio-waste.

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\(^9\) [http://www.norwaygrants-greeninnovation.no/](http://www.norwaygrants-greeninnovation.no/)

\(^10\) [http://www.bpva.org/bg/articles/article2398.html](http://www.bpva.org/bg/articles/article2398.html)


\(^12\) Video presentation about installation is available on the following link: [https://www.youtube.com/watch?v=omr5xNGEfM&feature=youtu.be](https://www.youtube.com/watch?v=omr5xNGEfM&feature=youtu.be)
compost. The main annual production yield is 30 tons of ammonium sulphate for agricultural use, 13 tons of compost, and 600 MWh of electricity.

Barriers for eco-innovation development include lack of suitable places for the storage of recycled biodegradable waste, high cost for its transportation and lack of tradition for separate collection of waste.

Drivers for eco-innovation development refer to demand for the optimization of recycling processes employing reuse of materials and the production of new products and their utilisation.

Economic, social and environmental impact of the eco-innovation project:

- The new product (compost from biodegradable waste, ammonium sulphate) will be sold to interested organisations and companies and thus generate funding for self-support through covering its operational expenditures;
- The project creates new jobs and employment in the recycling sector;
- The project contributes to reduce the use of scarce natural resources through reuse of valuable components after processing of waste.

Integration of green energy solutions for transportation in an urban environment

The eco-innovation consists of an autonomous photovoltaic parking lot with a charging station for electrical vehicles, incl. bicycles and scooters. It was aiming at popularizing and integrating alternative forms of transportation which contribute to emission reduction.

During the European Week of Mobility 2013, the Bulgarian Photovoltaic Association organised a campaign aimed at popularizing innovative applications of photovoltaic technologies in the transportation sector as well as other areas of life. As part of this campaign, the association built an autonomous photovoltaic parking lot with a charging station. The energy used by the photovoltaic panels was used for charging electrical vehicles including bicycles of the brand “Drag” and scooters of the brand “Eco-mobility”. The Association offered event visitors to make a test drive with the objective of opening doors toward the integration of green energy solutions into the transportation sector and the urban environment. The campaign was a good example of displaying how ecological transportation and the production of clean energy could together effectively tackle the problems of the contemporary urban communities.

Barriers for eco-innovation development refer to dominance of conventional technologies in the national construction market. Drivers refer to lower fuel cost, reduced carbon emissions and higher recycling capacity of battery-powered motors as compared to gas-powered engines.

Economic, social and environmental impact of the eco-innovation project:

- Increase in fuel cost savings through the use of alternative forms of energy.
- Reduction of emission pollutants and increased health benefits through cleaner air.
- Preservation of scarce natural resources as well as reduction in air pollution through encouraging utilization of alternative energy sources.

http://ecomobility.bg/%D0%B0%D1%82%D1%83%D0%B0%D0%BB%D0%BD%D0%BE
Speedy Goes Green Project¹⁴

Speedy, a company for express delivery services invested in electric cars in order to lessen its transportation costs as well as aid in reducing air pollution. In addition, for environmental and economic purposes, Speedy Ltd transitioned its customers to electronic/paperless invoices.

Recognizing that electric cars are the future for transportation of people and goods due to their relatively lower exploitation costs and low harm to the environment, in 2013 Speedy Ltd began a new eco-innovative initiative by replacing its vehicle fleet with electric cars, brand: Renault Kangoo Zero Emission. Speedy is one of the first companies in Europe which started the exploitation of electric vehicles for business purposes. The total value of this investment is approximately 750 000 euro, funded through a standard financial leasing with no government subsidies, with an estimated 5 year period on return of investment. The initiative started with vehicle exploitation in the central part of the capital city of Sofia in November 2013.

Barriers for the eco-innovation development refer to the lack of well developed infrastructure in the country for charging electric vehicles and low promotion for and knowledge of the benefits of transportation means powered by alternative energy sources. Drivers are connecting with lowering transportation costs and preserving the environment.

Economic, social and environmental impact of the eco-innovation project:

- Low exploitation and transportation cost leading to increase in company profit and better economic performance and competitiveness;
- Creation of new work positions for company employees, engaged in charging stations for the electrical cars of the courier;
- Reducing air pollution and emissions.

The Nature Gate¹⁵

“The Nature Gate” is a designer product, developed by students E. Georgieva (New Bulgarian University), S.Mitova (University of Architecture), K.Kalachev and P.Domitrov (University of Forestry) in Bulgaria. It is constructed entirely from recycled materials, intended to embody the beauty and functionality of the basic elements in the urban environment, while passively educating society about sustainable living through proper recycling. The design is intended to educate not only through demonstrating the process of recycling, but also through an emphasis on the balance of nature.

The concept of "The Nature Gate" is intended to cover the entire range of topics on recycling and reuse of materials. This is a facility suitable not only for park but also for urban environment. Its

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¹⁴ http://www.speedy.bg/
¹⁵ http://ecodesignworkshops.files.wordpress.com/2013/07/9-1.jpg
structure is bio-morphine, created so as not to intrude, but rather naturally blend with its surrounding area. At the same time, the visual design employs the three characteristic colours associated with the separate collection of garbage—yellow, green and blue.

The design aims to help pedestrians recognize the facility’s function, even if only by its colour. The inspiration for its shape and structure, the interplay of two semi-arches, is drawn from the infinite form of the spiral. Both arches are constructed fully of recycled materials, which can be recycled and reused again. The semi arches are purposefully arranged asymmetrically relative to one another - one with a trash basket and the other with a bench. The concept is a comparison between organic and inorganic, nice and ugly, useful and harmful, etc. Although consisting of two halves, when pedestrians walk through the gate they have the feeling that it is one whole - a gate through which wholeness and a balance with nature can be achieved. The role of the Gate is to passively educate people of all age groups about the benefits of waste collecting and recycling, as well as display how waste can be transformed into something beautiful and functional. Both semi-arches use energy-efficient lights powered by a solar panel placed on the top of the Gate. The semi-arch with the bench is designed with grass beds in a way to create a feeling of sitting in a lawn. The semi-arch with the trash basket is intended to create a counterpoint to the one with the bench for the purpose of creating a comparison between life in a contaminated environment as opposed to life in harmony with nature.

Barriers for the eco-innovation refer stereotypes and traditional views on garbage-collecting vessels. Drivers refer to creating something beautiful and artistic of waste materials and educating people about conservation as part of a lifestyle.

Economic, social and environmental impact of the eco-innovation:

- Reducing the costs for materials and overall economic performance of organizations through recycling and reuse of waste.
- Passive education through demonstrating the visual and function benefits of waste recycling.
- Reducing the use of natural materials through the use of recycled ones thus protected the scarce natural resources and reducing air-pollution.

The Musical and Illuminating Trash Bins16

The Trash Bins were Designed by students Martina Chokova – University of Architecture, Civil Engineering and Geodesy, Petya Ilieva – University of Forestry and Konstantin Stoychev – National Academy of Arts.

Students designed a musical and an illuminating trash bin within the events taking place during the Sofia Design Week 2013. The proposed bins aim at promoting the idea of creating something pretty, useful and amusing from “waste stuff” and at the same time encourage a culture of recycling.

The trash bins are intended for use in open public places such as parks and playgrounds. The goal of their different and interesting design is to engage people and demonstrate how waste can have a second life and be used for creating functional and at the same time artistic items and products.

The illuminating bin is used for glass bottles. Its outer body is made from metal fitments. Metal mosquito net is used to keep the glass bottles inside and the lid is made from an old music record. The culminating element, which forms the bin as a colourful composition, is a light source mounted at the bottom which illuminates the broken glass inside the bin.

The musical bin is used for plastic and metal bottles. It is made out of parts from an old ventilation system which form the outer body. On the top, guitar strings attached in the form of a stairway produce chord sounds when an item is being thrown into it.

Artists’ intent is to change the filthy and boring trash bins with new, recycled “works of art”.

Drivers for eco-innovation development refer to the desire for bettering and diversifying the public urban environment through the introduction of creative and artistic solutions using waste materials. Barriers refer to the difficulty for accepting non-traditional designs for public property and lack of culture toward protecting and preserving it.

Economic, social and environmental impact of the eco-innovation:

- Lowering the costs associated with the production of trash bins for public and private parks as well as playgrounds;
- Encouraging a culture of recycling through different and interesting designs;
- Reducing natural materials' use via re-use of waste materials.

References


### ANNEX 1. Policy measures addressing eco-innovations in Bulgaria

<table>
<thead>
<tr>
<th>Group of policy measures</th>
<th>Type of policy measure</th>
<th>Specific measure</th>
<th>Focus of policy measure</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Equity/business support</strong></td>
<td>Venture capital funds</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>
| | Public guarantee funds | Bulgarian Development Bank\(^\text{17}\) has established a bank group of its own, which comprise:  
- Bulgarian Development Bank  
- National Guarantee Fund\(^\text{18}\)  
- Capital Investment Fund  
The Bank aimed at improvement, stimulation and development of overall economic, export and technological potential of small and medium-sized enterprises by facilitating their access to financing;  
Energy Efficiency and Renewable Sources Fund | X |
| **Support for R&D in public sector and industry** | R&D funding | Bulgarian Science Fund\(^\text{19}\) | X |
| | Collaborative grants | - |  |
| **Fiscal measures** | R&D infrastructure | Accelerated tax depreciation for machinery, manufacturing equipment and devices that are part of the initial investment or acquired in connection with an investment to improve energy efficiency | X |
| | Tax incentives for R&D and start-ups | Accelerated tax depreciation (100 % per annum) for the asset formed as a result of R&D  
Tax deductible expenses for donations in favour to Fund “Energy Efficiency and Renewable Energy.” | X |
| | Tax incentives for R&D personnel | Exemption from corporate tax and income tax - Bulgarian Academy of Sciences, Academy of Agriculture and other | X |
| **Education** | Tailored training courses | Project “Associations for qualification” | X |

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\(^{18}\) [http://bbr.bg/en/%D1%81%D0%B5%D0%BA%D1%82%D0%BE%D1%80-%D1%80%D0%B8%D0%B1%D0%B0%D1%80%D1%81%D1%82%D0%B2%D0%BE.html](http://bbr.bg/en/%D1%81%D0%B5%D0%BA%D1%82%D0%BE%D1%80-%D1%80%D0%B8%D0%B1%D0%B0%D1%80%D1%81%D1%82%D0%B2%D0%BE.html)

\(^{19}\) [http://www.bulfund.com/?lang=en](http://www.bulfund.com/?lang=en)
<table>
<thead>
<tr>
<th>Training and mobility</th>
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</thead>
<tbody>
<tr>
<td>for companies, entrepreneurs</td>
<td>Pilot approbation of Austrian attempt to create associations for qualifications that could provide better opportunities for education and training to employees of small and medium enterprises.</td>
<td>X</td>
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<tr>
<td>Scheme “Social Innovation in Enterprises”</td>
<td>X</td>
<td></td>
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<tr>
<td>Scheme “I can do more” for employees to adopt a new professional qualification and new key competences (foreign languages, computer skills, etc.)</td>
<td>X</td>
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<tr>
<td>Advise/consulting for start ups, companies, entrepreneurs</td>
<td>Scheme “Encouraging the start of projects for development of own business activities” with two components: training and financing.</td>
<td>X</td>
</tr>
<tr>
<td>Scheme “Qualification and training for employees” - Objective: Provide training for employees in micro, small, medium and large enterprises to increase productivity and create conditions for sustainable employment.</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Placement schemes for students</td>
<td>“Career Start” Program - Objective: Provide opportunities for gaining of work experience by young graduates in order to facilitate the transition between education and the labour market.</td>
<td>X</td>
</tr>
<tr>
<td>Scheme “A New Job” - Objective: To encourage employers to hire young unemployed under 29 years of age, by providing employers support to cover investment costs and labour costs associated with the creation of new jobs for the target group.</td>
<td>X</td>
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<tr>
<td>Scheme “First Job” - Objective: To support employment of young unemployed people up to 29 years, by providing incentives for employers to hire them.</td>
<td>X</td>
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<tr>
<td>Scheme “System for career guidance in school education”</td>
<td>X</td>
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<tr>
<td>Scheme “Creation of youth employment by providing internship opportunities”</td>
<td>X</td>
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<tr>
<td>Scheme “School and Student Practices”</td>
<td>X</td>
<td></td>
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<tr>
<td>Scheme “Development and implementation of a management system of vocational education in vocational schools”</td>
<td>X</td>
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<tr>
<td>Support for R&amp;D workers recruitments</td>
<td>Scheme “Support for the development of PhD students, postgraduate students and young scientists”</td>
<td>X</td>
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<tr>
<td>Scheme “A system for training and career development of university professors”</td>
<td>X</td>
<td></td>
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<tr>
<td>Networks and partnerships</td>
<td>Competence centres,</td>
<td></td>
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<tr>
<td>Scheme “Developing a System to identify and recognize informally acquired knowledge, skills and competence”</td>
<td>X</td>
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<tr>
<td><strong>DEMAND SIDE FOCUS</strong></td>
<td><strong>Regulations and standards</strong></td>
<td><strong>Public procurement</strong></td>
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<tr>
<td></td>
<td>Regulations, targets, cap &amp; trade schemes</td>
<td></td>
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<tr>
<td></td>
<td>Performance standards, labeling, certification</td>
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<tr>
<td></td>
<td>&quot;Green&quot; public procurement of goods and services</td>
<td>National Action Plan for the Promotion of Green Public Procurement for the Period until 2014</td>
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<tr>
<td></td>
<td>R&amp;D procurement</td>
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<td></td>
<td>Pre-commercial procurement</td>
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</tbody>
</table>

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20 http://sofiatech.bg/%D0%B7%D0%B0-%D0%BD%D0%B0%D1%81/%D0%BA%D0%B0%D0%BA%D0%B2%D0%BE-%D0%B5-%D1%81%D1%82%D0%BF/

21 http://www.bulfund.com/2012/04/26/%D1%83%D1%87%D0%B0%D1%82%D0%B5-%D0%B2-era-net-%D0%BF%D0%BE-7%D1%80%D0%BF/?lang=en#more-635

22 http://lex.bg/laws/ldoc/2135472978

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**Eco-innovation in Bulgaria**
<table>
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<tr>
<th>Technology Transfer</th>
<th>Support of private demand</th>
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</thead>
<tbody>
<tr>
<td>Advisory support for technology adopters</td>
<td>Demand subsidies (e.g. eco-vouchers, consumer subsidies)</td>
</tr>
<tr>
<td>Financial or fiscal support for technology adopters (e.g. grants for purchasing new technology)</td>
<td>Awareness raising and information provision</td>
</tr>
<tr>
<td>Tax incentives for consumers (e.g. for purchasing environmentally efficient products)</td>
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</tr>
<tr>
<td>Tax reductions for products and services (e.g. VAT reductions)</td>
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</tr>
</tbody>
</table>

Financial or fiscal support for technology adopters:
- Scheme “Development of electronic distance learning in higher education system”
- Scheme “Improving quality of vocational training”

Support of private demand:
- Tax incentives for consumers (e.g. for purchasing environmentally efficient products)
The Eco-Innovation Observatory (EIO) is an initiative financed by the European Commission’s Directorate-General for the Environment. Since 2009 the Observatory has been developing an integrated information hub on eco-innovation addressed to business, policy makers, innovation service providers and researchers. The EIO supports the implementation of the European Eco-Innovation Action Plan of the European Commission.

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