

GREEN SOLUTIONS FROM BULGARIA 2025

FOCUS: INNOVATIONS



**Second national survey of green innovation
projects - startups, civil society initiatives,
and research projects**

MOVE.BG

2025 National survey Green
Solutions from Bulgaria 2025
carried out by **MOVE.BG**
Foundation

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■ **MOVE.BG, AUTHOR OF THE SURVEY GREEN SOLUTIONS FROM BULGARIA 2025**

MOVE.BG is an incubator of ideas and a platform of makers. The organisation seeks innovative solutions for social change and works for sustainable development and promotion of a culture of constructive dialogue, active leadership, and shared values.

Since its establishment in 2013, **MOVE.BG** has developed partnerships with more than 60 Bulgarian and international organisations and has been working with over 2,200 volunteers.

MOVE.BG initiated EDIT, Programme for Economic Development via Innovation & Technology, and Urban Jungle, Programme supporting the green transformation of Bulgaria.

MOVE.BG was the author of [InnovationShip](#), the first national survey of the startup ecosystem in Bulgaria.

Since 2020, the organisation has actively supported Bulgaria's successful green transition through [various initiatives](#), such as open letters, round table discussions, and conferences.

MOVE.BG has published a series of special expert reports in support to the green transition in Bulgaria: [Mission Green Bulgaria](#), [Mission Energy Transition](#), [Mission Green Sofia: Prepared for the Future](#), and [Mission Green Innovation: A Prosperity Compass](#).

MOVE.BG made a special analysis of the management of the climate transition and the green transformation in Europe, which was summarised in an [expert report](#) containing some specific recommendations to Bulgaria.

MOVE.BG believes that Bulgaria has the potential to be among the leaders of green and innovative development in Europe.

Further details at: www.move.bg

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THE ORIENTATION WITH NO ALTERNATIVE: GREEN DEVELOPMENT

The response of the business community and the general public to the re-definition of Europe's green agenda was not straightforward. Some considered the Clean Industrial Deal to be a step back from the ambitious green transition agenda but this new framework of our economic development, if interpreted truthfully, creates the solid practical foundations for Europe's competitiveness and for promoting its role as a leading factor in the economy of tomorrow.

For the economy of the future is not only digitally based and AI integrating; it is inevitably green.

Mitigating climate change effects and restoring nature that has been seriously damaged due to human industrial intervention and consumption call for urgent nonconventional measures. To ensure favourable conditions for the economy and life in the future means to make available entirely new technological solutions and approaches and to fundamentally change our habits of living. These circumstances serve as a powerful trigger to scientific and business development of novel solutions for climate adaptation and green transformation. They include alternative energy systems and efficient use, water treatment and reuse, soil conservation and restoration, use of biological products in farming, cultivation of new and more resilient plant species, introduction of high-tech monitoring systems and zero waste models for urban management and production organisation.

I would like to remind those who doubt the important role of these solutions in future that today USD 44 trillion of annually generated economic value, or over a half of the world's GDP, is moderately or highly dependent on nature. Each one-degree Celsius increase in global temperature costs a 12-percent decline in GDP (EcoWatch). The way out is decarbonisation of the economy in all its aspects. The accelerated introduction of environmentally friendly innovation, the implementation of ESG monitoring programmes, green offsetting programmes and investment in nature-based solutions are all necessary steps to be made by those who want to matter in the economy of tomorrow.



Being aware of these prospects, we at **MOVE.BG** decided to explore systematically where Bulgaria stood in that process. For a second year in a row, we tried to identify the green development "agents" in this country and to research its resources to be a full-fledged participant in the low-emission economy of tomorrow which analysts estimate to be multi-trillion worth. Our survey makes a unique blend of research development and solutions to environmental challenges, green startups and environmentalist organisations because each of them, from their own perspective, contributes to the joint effort to address the global climate challenges and to overcome the loss of biodiversity which is critical to our lives.

I do believe that the data and conclusions from this analysis will help identify the potential of this bank of innovative solutions and introduce targeted policies to promote the green economy and science, to ensure a successful energy transition, and to develop specialised investment instruments and that they will also gain a wide range of supporters and resources for nature restoration projects. Nature is not merely only home; nature is our prosperity.

Sasha Bezuhanova, Founder of MOVE.BG

GREEN INNOVATION: THE FOUNDATION OF A NATIONAL COMPETITIVENESS STRATEGY FOR BULGARIA

Green innovation is not a hope but a solution

Green innovation underlies the recovery of Europe's competitiveness, sustainable economic growth and effective decarbonisation. In 2024, the first national survey Green Solutions from Bulgaria 2024 was conducted with a focus on innovation in the energy sector, energy technologies and decarbonisation solutions in industry.

Energy transformation has become particularly topical over the last two years due to the lively public debate on the just transition and the reduction of the dependence on fossil fuels, the development of new facilities, and the application of a smart approach to the deployment of renewable energy sources (RES), including storage, infrastructure and digitalisation technologies. **The energy policy continues to be in the lead for the overall development strategy of Bulgaria, the European Union and the world at large. The current short-term goal is to implement the [Fit for 55](#) legislative package.**

Last year's survey came to prove the need for more thorough exploration of the various technological solutions for decarbonisation, restoration of the balance of nature and resources, adaptation of the individual sectors to climate change and focused identification of trends in the development of innovative companies, and implementation of innovative solutions. Green innovation or eco-innovation is a particularly significant contributor to the overall economic and energy transformation.

Innovation, science, partnerships: the 2025 focus of MOVE.BG

The European Union defines innovation as one of the three major pillars of [the Compass to regain competitiveness and to secure sustainable prosperity](#), the political document outlining the framework of EU policies in the next five years to come and highlighting green transformation as a strategic objective. Therefore technologies, innovation and the development of innovative enterprises aimed at strengthening the green transformation are the focal point of the 2025 survey of **MOVE.BG**.

They are not considered to be a separate independent sector as they are closely related to:

- the development of the research capacity;
- the participation of civil society organisations;
- the mutual partnership and support in seeking and providing complex sustainable multi-component solutions for industry, for the state, and for conservation and restoration of Bulgaria's natural resources.

Bulgaria and the EU: Competitiveness and challenges

Notwithstanding the clear commitment of the new European Commission for the years to come and the targeted EU policies for innovation, competitiveness and climate neutrality over the last two decades, Bulgaria continues to rank second to last in the [EU Innovation Index](#) (European Innovation Scoreboard 2025) and last in the [EU Eco-innovation Index](#).

The good news: Bulgaria has scored improvement in both indexes over the period from 2014 to 2024, especially as a result of the investments from the EU structural and investment funds in, for instance, incentivising enterprises to introduce environmentally friendly technologies and use the ISO 14001 certificate, or in modernisation and research infrastructure.

But: 2025 saw an annual decline in the innovation index. Generally, the results reveal that we are trying to catch up rather than prioritise economic sustainability and competitiveness policies through real measures and performance indicators. Thus, we remain highly vulnerable to external factors and fail to forecast and develop an adaptive political and financial framework to support innovative companies in their development under the conditions of global competition, high energy prices and technological, often resource-based, dependence.

Strategic advantages and need for change

Bulgaria has a lot of strategic advantages which, provided that focused solutions and specific legislative and financial incentives are available, can speed up the creation of conditions to attract investment, to cope with multiple social and environmental problems in the regions, and to re-inspire and make our entrepreneurs and innovators do business in Bulgaria. **It is only through:**

- developing startups and innovative small and medium-sized enterprises,

- supporting the transfer of technologies to industry and the public sector, and
- involving the civil society sector

that new jobs can be created, sustainable value chains can develop, and the introduction of green solutions can be accelerated.

Mission Green Solutions from Bulgaria 2025

The national survey Green Solutions from Bulgaria 2025 has the following objectives:

- to outline the actual situation of green initiatives in the country;
- to provide data- and evidence-based recommendations for the development and sustainability of innovative companies, products and partnerships.

The focus is laid on green policies because Bulgaria has both:

- strategic advantages (rich biodiversity, a strong research network, water resources, preserved rural areas and crops, etc.); and
- structural challenges (pollution, drought, weak innovation in agriculture, delayed energy reforms, an underdeveloped standardisation system, insufficient implementation of smart data-based urban solutions).

These challenges can turn into opportunities for growth and development based on innovation, entrepreneurship and partnerships.

Climate challenges and the need for a new approach

We believe that a fast large-scale achievement of these objectives with strong impact on society calls for turning policies related to the adaptation to climate change and the restoration of balance and natural resources into an inclusive flagship policy in all sectors.

According to the data from [the European Environment Agency](#) weather- and climate-related extremes caused **economic losses of assets estimated at EUR 738 billion during 1980-2023** period, net of the impact on social systems, financial markets and natural resources.

We need a new way of thinking, new design and implementation of data- and evidence-based policies and instruments by all stakeholders.

It is not by chance that the [Fit for 55](#) package envisaged the establishment of the [Social Climate Fund](#) aimed at synchronising the efforts of Member States to prioritise and join policies for the reduction of emissions in road transport and construction, as well as to support vulnerable households, micro-enterprises and transport users.

This Fund is only a part of the whole range of instruments and policies for innovation and technologies, climate and economic transition which also includes [the Innovation Fund](#), [the Horizon Europe framework programme for research and innovation](#), [the LIFE programme](#), the Just Transition Fund, the Modernisation Fund, the European Regional Development Fund, the Recovery and Resilience Facility and others. The implementation of the national recovery and resilience plans is also expected to produce a substantial impact on the economic transformation of the Union and of Bulgaria.

The European green transition is not just an environmental cause; it is a chance for long-term competitiveness, social cohesion and national security.

The success of this transition hinges on the active investment in, promotion and integration of startups, research institutions and the civil society. **Each of these groups is an indispensable participant, innovation driver, social benchmark and source of knowledge.** It is only through targeted support and collaboration that Europe – and Bulgaria as an integral part of it – can unleash its full potential as a world leader in clean technologies and sustainable development.

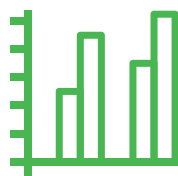


Figure 1. Measuring success and attracting investment.



Data

Data collection and analysis for making informed decisions



Indicators

Measuring the success of green innovation policies



Trust

Regaining the trust in green initiatives



Financial sector

Promoting investment in green startups



Partnerships

Establishing public-private partnerships for the green transition

CHAPTER 1:

THE GREEN TRANSITION –

A CHANCE FOR LONG-

TERM COMPETITIVENESS



1.1. THE ROLE OF INNOVATIVE STARTUPS, CIVIL SOCIETY ORGANISATIONS AND RESEARCH ORGANISATIONS FOR A SUCCESSFUL GREEN TRANSFORMATION AND PROSPERITY

In the pursuit of climate neutrality by 2050, the European Union has developed one of the world's most ambitious political and investment packages for decarbonisation and green transition. This transformation is not a single act or just a statutory requirement; it is a living process which encompasses the whole ecosystem around us and reshapes the way in which industry, regions and societies operate in Europe. The momentous transition is not confined to big industrial companies and political institutions seeking to tackle the crisis with critical resources, the high electricity prices, the decline in the competitiveness of European industries, and the impact of greenhouse gas emissions on health, biodiversity, urbanisation and agriculture. The economic transformation covers, includes and impacts strongly all three key groups involved in this survey: innovative enterprises (startups and micro- and SMEs), civil society organisations (NGOs), and research teams and research organisations.

The objective of this study is to identify the main challenges facing the three groups of participants in the green transformation, outlining the opportunities for development, for integration of their potential in the country's growth, and for the preparation or rather catching up in the adaptation to the anticipated changes across the board from the decarbonisation of leading industrial enterprises to a new approach to farming and bioresources, preparation of cities to shift to smart resource management and development of mitigation and adaptation systems, restoration of soils and biodiversity and conservation of water resources.

The EU green transformation policy is subjected to multiple diametrically opposed criticisms by leading industries and the nongovernmental sector alike, especially in the geopolitical context where big countries like China and India open new coal power plants, where we are witnessing some shift in the US climate policy and, last but not least, where a global fight and competition take place among all for access to new resources and rare earth metals (e.g. Africa and Central Asia). It is not the subject-matter of this study to check whether criticisms are justified or not, or whether they belong to a

massive disinformation campaign or even anti-green propaganda or they result from the lack of sufficient information and access to verified and authentic information on climate change because sufficient professional publications are available on this issue and many valuable academic, political and economic debates are underway to address the issue whether accelerated or slowed down green transformation is needed.

Once again, the green transformation is taking place, regardless of whether the issue is still debatable or not. Side by side with the digital transformation, artificial intelligence (AI) and Industry 4.0, the green transformation reshapes economic models, established markets, societal attitudes and education to create exponential opportunities for development of technologies and innovation. Big industrial companies should take up their serious role in and commitment to decarbonisation and the effects of the overall transformation covering also labour markets, transport and the energy sector. However, they cannot and should not be lone players. Of course, politics intervenes with diverse instruments of legislative nature or financial offsetting models, but the truth is that a holistic model is needed where the industrial transformation is supported by innovative enterprises and startups, the nongovernmental sector, and research units.

The green transformation policy offers legislative, financial and other measures to promote and encourage the creation of new jobs, technologies, products and services of pivotal importance for the faster adaptation of big industries, for comprehensive transformation, where possible, for ensuring competitive advantages and reducing the adverse social impacts, be it through changes in the labour market or through new skills and new jobs. The specific measures are laid down in the four main pillars of [the Green Deal Industrial Plan](#).

The green transformation is the pathway to prosperity, sustainability and faith in the future!

Therefore, we focus our study on the three groups of key players that are indispensable if we need to achieve sustainability of the four pillars of the EU Industrial Plan and to ensure public awareness of the need for change of the model but also for speed and transparency of the political decisions made at the national level. Ultimately, our objective is to show and tell how the change can take place and how conditions can be created for prosperity of our society and for faith of the young generation in the future of this planet!

Research communities are sources of expertise,

specialised infrastructure and data, technologies and new knowledge. They generate the conditions for innovation and transfer of technologies.

Innovative companies and startups attract private capital to implement the research ideas and to pilot new technologies. They take the risk to test and launch new products and markets. **Civil society organisations** are part and parcel of the policy of adaptation to climate change and **the just transition**, safeguarding the social legitimacy, regional balance and involvement of the people in the adaptation process. Their participation is a must for coping with the regional, economic and environmental challenges of the transformation.

1.2. BULGARIA'S GREEN ECOSYSTEM: KEY PARTICIPANTS AND TRENDS

The national survey Green Solutions from Bulgaria 2025 was designed to establish the actual state of green initiatives in the country and to identify the specific challenges hampering the development of the key participants in the innovation ecosystem and in the green transformation. For the purposes of this study, "green innovation" or "eco-innovation" means new ideas, processes, models, products or methods that contribute to the advancement of green development, reducing the impact of human activity on the environment. The analysis is based on data collected from March to May 2025. The research methodology is a direct online survey conducted by Nasoca Sociological Agency as assigned by **MOVE.BG**. The questionnaire had been drawn up by the experts of **MOVE.BG** and the respondents were reached through a targeted information campaign. A total of 135 questionnaires were effectively filled in within the three key target groups:

1. Innovative micro-, small and medium-sized enterprises in the startup or scaleup phase: 55 respondents (40.7% of the sample);
2. Green organisations and initiatives: 48 respondents (35.6% of the sample);
3. Research organisations and research projects: 32 respondents (23.7% of the sample).

It is important to note that the data from the survey are not considered to be a representative sample for the whole country as they outline the general trends and the specific characteristics within the defined target groups. Nevertheless, they represent a valuable snapshot of the ecosystem to inform the relevant conclusions and recommendations.

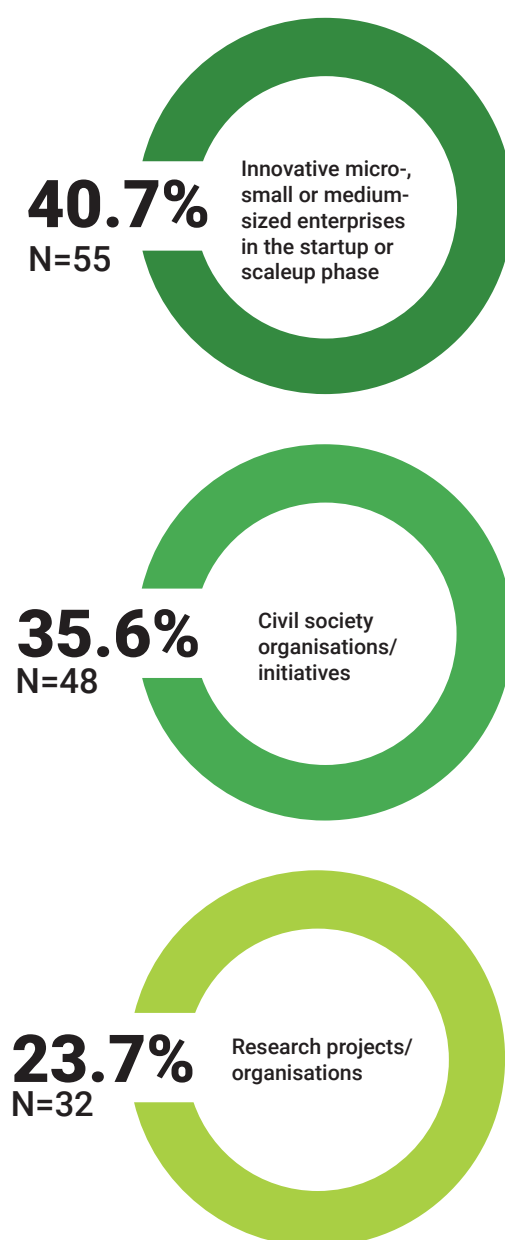


Figure 2. Number of respondents who filled in the questionnaire in 2025 by groups.

The analysis of the results of the survey among the three target groups reveals an ecosystem that is characterised by structural homogeneity and, at the same time, by clear functional diversification. All three segments are dominated by small teams with scarce resources, which suggests the existence of common challenges relating to their capacity and scaleup capabilities. However, their functions within the framework of the larger innovation system are clearly distinct: innovative micro-, small and medium-sized enterprises are focused on the development of commercial products; nongovernmental organisations (NGOs) should encourage the dialogue between different social groups, support the exercise of scrutiny on behalf of the civil society, and perform important social functions like informal education and others; science generates fundamental knowledge and technologies.

1.2.1. INNOVATIVE MICRO-, SMALL AND MEDIUM-SIZED ENTERPRISES (SMES): DRIVERS OF MARKET-ORIENTED SOLUTIONS

The business segment of green innovators is made up of mainly small and flexible but severely under-resourced teams.

- **Structure and scale:** The data show that micro-enterprises prevail in the ecosystem. A total of 80% of the companies involved in the survey have up to ten employees, over a half of them (52.7%) having teams of only one to three employees. The shares of small enterprises (11-50 employees) and medium-sized enterprises (over 50 employees) are much smaller (16.4% and 3.6% respectively). This structure implies a high level of adaptability but also recurrent difficulties in working on larger projects, ensuring specialisation of the employees and entering international markets.

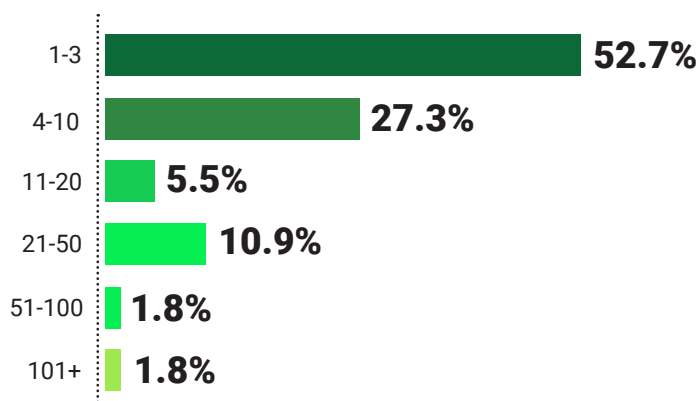


Figure 3. Number of employees (full-time and part-time) in the category of micro-, small and medium-sized enterprises.

- **Spheres of operation:** There is a distinct market focus on sectors with high growth potential and regulatory pressure. **The circular economy** (including waste management and reuse of materials) is the dominating sphere of operation which was indicated by 60.0% of micro- and SMEs. It is followed by **the energy sector and energy efficiency** (32.7%) and **climate** (30.9%). All these data come to show that entrepreneurs are strongly oriented to the development of solutions to the most urgent environmental and economic challenges.

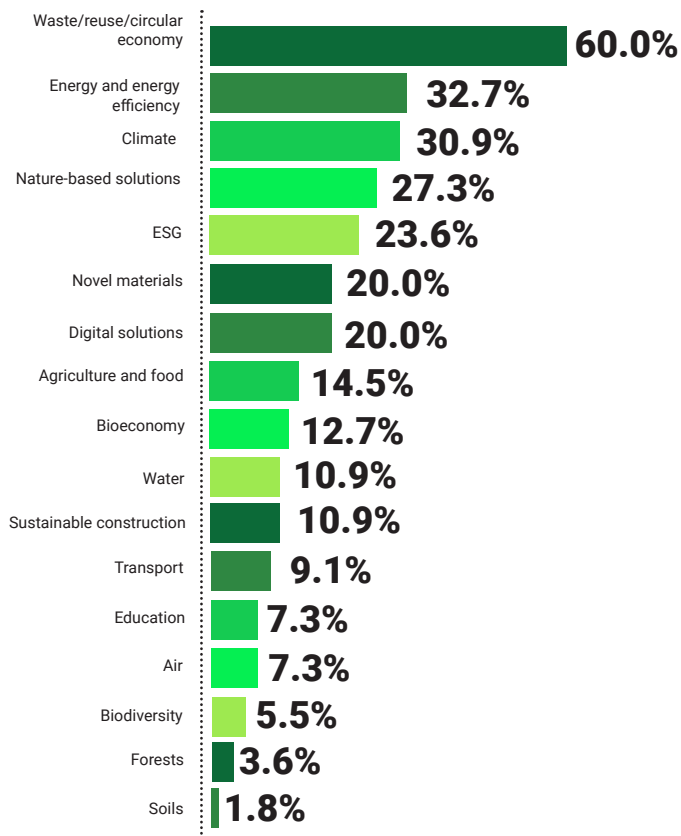


Figure 4. Which sector is the main activity of your company focused on? Category of micro-, small and medium-sized enterprises. More than one answer was possible.

- **Market orientation:** The analysis revealed an important strategic change in the market orientation of green startups. In the past, their focus was mainly on end consumers (B2C), whereas today there is a clear shift to business clients (B2B). Most of the innovative micro- and SMEs target other **small and medium-sized enterprises** (78.2%) and **corporate/big clients** (63.6%). Companies oriented to end consumers account for a smaller share (54.5%), while the public sector (B2G) is a considerably less important market (32.7%). This change could be interpreted as a sign of a maturing ecosystem seeking larger, more sustainable and wider (in market terms) business opportunities.

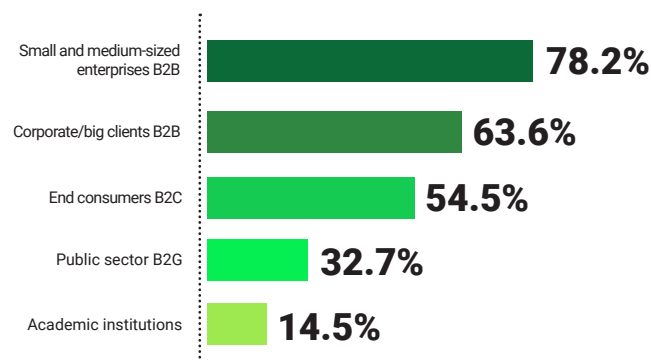


Figure 5. What is your customer base? Category of micro-, small and medium-sized enterprises. More than one answer was possible.

Micro- and small enterprises are the backbone of green innovation, but they remain vulnerable without support to their growth.

1.2.2. GREEN ORGANISATIONS AND INITIATIVES: CATALYSTS OF SOCIETAL CHANGE

The civil society sector plays a key role in raising public support and awareness of green issues but, much like the business sector, it is mainly comprised of small teams.

- **Structure and capacity:** Similar to SMEs, many green organisations are small in size. Close to one quarter of them (22.9%) operate entirely on the basis of the volunteer principle without any hired staff. More than 70% of the organisations in total have up to 10 employees, which raises the issue of their capacity to develop sustainably and to produce a lasting impact.

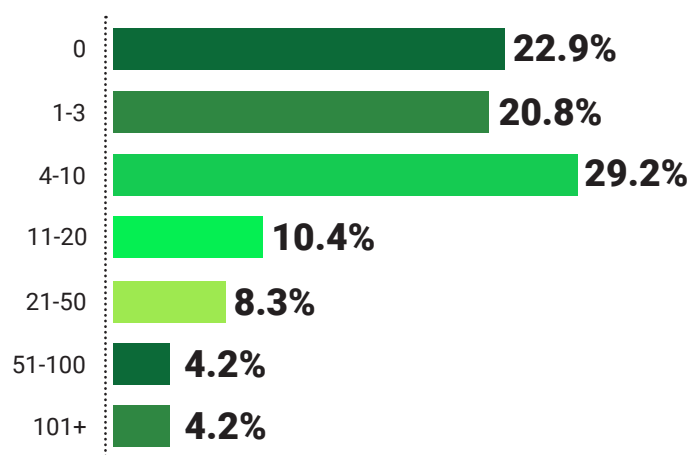


Figure 6. Number of employees (full-time and part-time) in the category of civil society organisations and initiatives.

- **Thematic focus:** The overwhelming majority of green civil society organisations work in the field of education which is the most common activity among them. Many organisations engage in initiatives related to climate and environmental protection which become ever more topical from one year to another. Nature-based solutions, too, have a strong presence in the sector, including projects for conservation of biodiversity, forests and soils, as well as initiatives in the field of the circular economy and energy efficiency.

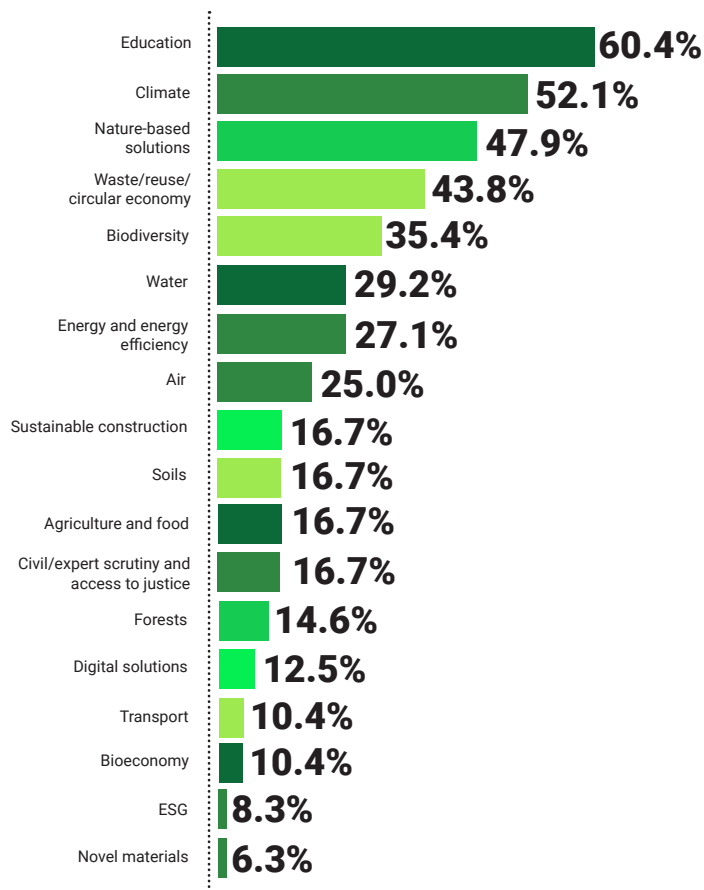


Figure 7. Which sphere is the main activity of your organisation/initiative focused on? Category of civil society organisations. More than one answer was possible.

For the sake of greater clarity, these organisations can be grouped into several main thematic clusters:

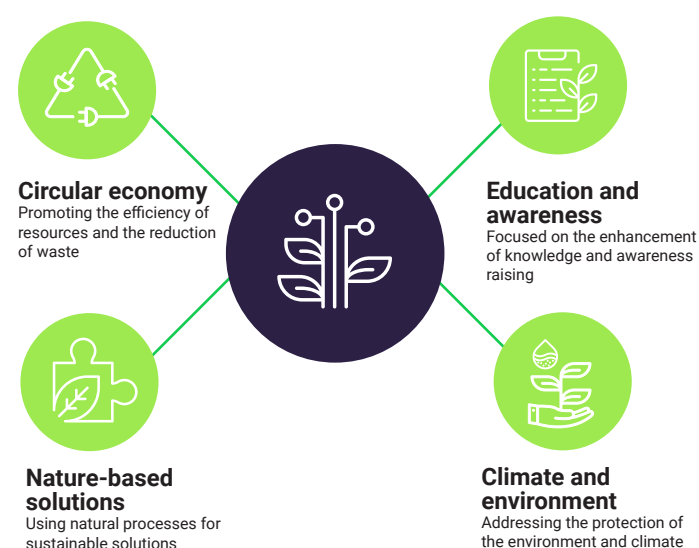


Figure 8. Organisational thematic clusters.

The activities of green civil society organisations are concentrated mainly on awareness raising and public engagement. Almost all organisations in the sector work actively to develop knowledge and understanding on issues related to green policies through campaigns, trainings, educational initiatives and dissemination of information. This educational and communication function is the backbone of the sector.

The second most important activity is focused on the mobilisation of public support through motivating volunteers, setting up collaborative networks and organising public events. Trainings and the work with various target groups are essential components of their day-to-day work.

A smaller number of the civil society organisations engage in **direct nature restoration field work**, such as biodiversity conservation, cleaning events, monitoring of the environment, as well as political advocacy for legislative changes to the benefit of sustainable development.

The highest specialisation level is characteristic of organisations which develop and promote green innovation and solutions for a more environmentally friendly lifestyle, such as campaigns for separate waste collection, promotion of sustainable products or innovation in everyday habits.

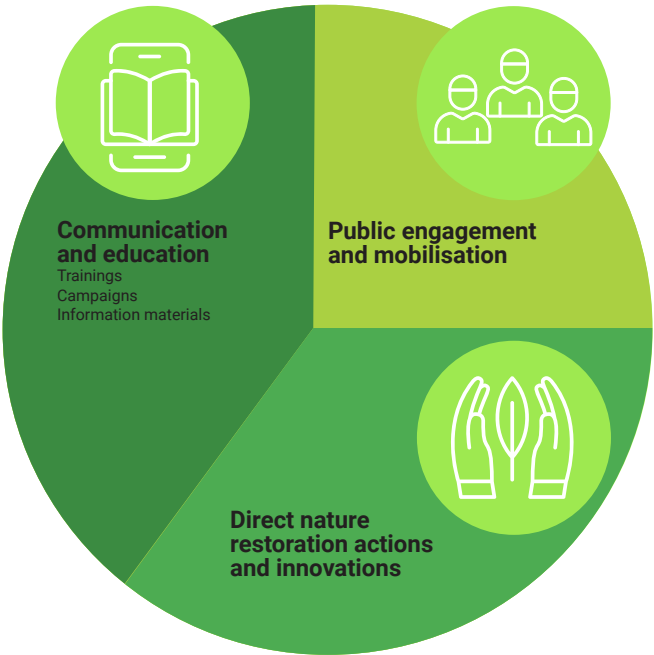


Figure 9. Main groups of activities of civil society organisations and initiatives.

1.2.3. RESEARCH ORGANISATIONS AND PROJECTS: RESEARCH FOR A SUSTAINABLE FUTURE

The development of green innovation needs support to the research teams that are already working on the crucial environmental challenges.

The research sector is the third key pillar of the innovation system which also is characterised by small and highly specialised teams. The target group of research projects and organisations included 32 respondents. Generally, if the number of respondents was compared to the total number of Bulgarian research organisations and universities which have facilities, training, researchers and carry out research and other related activities in key spheres of knowledge related to green technologies, the sample would definitely be insufficient. However, it is important to underscore that the survey was targeted mainly at those research teams which had active projects underway or carried out activities that were aimed at or directly contributing to higher technological levels of development and transfer to businesses.

In this context, it is possible to draw sufficiently reliable conclusions on the overall research ecosystem in Bulgaria as follows:

- **Team structure:** Most research projects (62.5%) are implemented by small research teams of up to ten researchers. The typical size of the team ranges between four and ten members (34.4%).

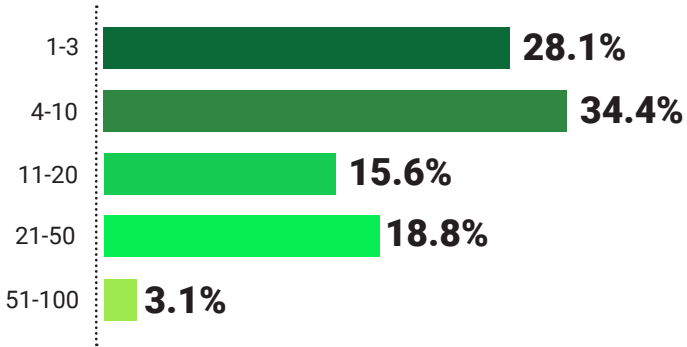


Figure 10. Number of employees (full time and part time) in the category of research organisations and projects.

- **Priority fields of research:** There is significant overlapping between the priority fields of research and business priorities, which is a positive sign of potential synergy with regard to green innovation.

Main green research topics and priorities (2025)

The data from the national survey make it clear that the greatest number of research projects concentrate on the circular economy and waste management (46.9%), followed by the bioeconomy, water and climate (34.4%), energy, agriculture and food (28.1%), and biodiversity (25%). Besides, there is an increase in interdisciplinary projects combining elements of precision farming, digital technologies, nature-based solutions and sustainable management of ecosystems. Most teams emphasized on their work in several fields and a sizeable portion of them also indicated education and training since the training of human resources is an intrinsic part of their work.

Still, it is worth going deeper into the individual fields of research so that to gauge the availability of a critical mass and the existence of real interest in and incentives for the development of research related, most generally, to “green” topics.

1. Circular economy and waste management (46.9%)

Focus on closing resource cycles, recycling, reuse, waste minimisation and development of novel products/solutions from waste materials. Here waste management is addressed as practical implementation of the circular economy but there often are separate innovations focused specifically on the technological processes of waste treatment, recovery or reduction.

2. Bioeconomy (40.6%)

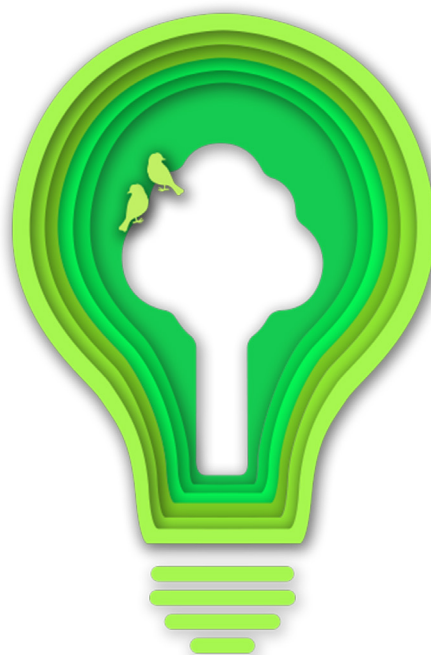
Use of biological resources (biomass, biotechnologies, agri-innovation) to develop sustainable products and services. There is partial overlapping with the circular economy but the emphasis here is on agriculture, food and biomaterials. Bioeconomy and sustainable farming are important separate spheres which complement each other with other fields like water, energy and food.

3. Water and climate (34.4%)

- A substantial portion of the research projects tackle the sustainable management of water resources, new water treatment technologies, the conservation of water resources, and the adaptation to climate change. Their research often uses integrated approaches to the water sector, climate and agriculture.
- Nature-based solutions and ecosystem

services (e.g. afforestation projects, recovery of ecosystems).

The fact that the circular economy features in the top three priorities of all three groups is a major strategic signal. This is not a coincidence; it is a clear sign that the circular economy is the intersection of the market demand (identified by businesses), the public interest (manifested by NGOs), and the research potential (provided by science).





CHAPTER 2:

GREEN SOLUTIONS FROM

BULGARIA 2025:

FOCUS INNOVATION

2.1. BULGARIA AND EUROPE: WHERE DO WE STAND IN THE GREEN INNOVATION COMPETITION?

Bulgaria continues to experience serious difficulties in the dissemination of new technologies and the development of innovative potential. The country ranks last-but-one in the EU innovation scoreboard ([European Innovation Scoreboard 2025](#)). Bulgaria belongs to the category of the least performing innovators (Emerging Innovators) at 51.6 points, but it is substantially lagging behind the first three countries in this group (Hungary, Poland and Slovakia) with 78.3, 74.2 and 70.5 points respectively. The best performers (the top category of Innovative Leaders) are Sweden performing at 155.5 point, Denmark at 152.0 points, the Netherlands at 145.3 points, and Finland at 141.1 points. Furthermore, Bulgaria was the lowest-performing country in the eco-innovation index ([Eco-Innovation Index 2024](#)) in 2024 just like its ranking last in 2014 when the index was published for the first time.

At the same time, we have witnessed quite a number of changes over the last decade and, to be true to facts, a lot of substantial differences can be observed in the innovation ecosystem. Practices have been put in place and there is the political will to adopt important strategic documents, such as the Innovation Strategy for Smart Specialisation, the 2030 Research Development Strategy, and the Research and Innovation Promotion Act adopted a year ago. Furthermore, the ecosystem for startups and innovative enterprises is developing rapidly with significant achievements like the country's first unicorns (Payhawk, Shelly Group) together with the development of a sustainable ecosystem to support such companies through the Fund of Funds, venture capital funding and accelerator programmes, as well as an overall shift in the mindset and support to the development of entrepreneurial skills. For example, over the last ten years, various initiatives of MOVE.BG have involved many startups, some of which have succeeded in achieving a breakthrough with successful projects within the framework of [the European Innovation Council](#) (EIC). Our efforts brought about the government's decision of 2022 [to support](#) innovative SMEs awarded the EIC Seal of Excellence so that to gradually build up a critical mass of companies working in the field of disruptive green and digital innovation.

As far as research is concerned, sizeable investments have been made in the research infrastructure for the first time since 1989, leading to substantial improvements in the availability of

specialised equipment. Targeted measures have been adopted to raise the pay of researchers and teaching staff members. Significant support has been provided to increase the visibility of research results in international databases.

Faster reforms and real investments are needed to turn Bulgaria into a strong innovator by 2030.

The question why we still lag despite all that continues to be a matter of concern, and it seems to have a counter-productive effect because there is no debate on our ranking in the EU innovation scoreboard. Neither politicians nor entrepreneurs pay attention to it because of their understanding that the successful outcomes described above are sufficient. They might be right, and it might be only a matter of time to move up in various indexes and scoreboards. But what if we reverse question and ask **how we can become a strong innovator by 2030?** Because the country's policy is actually to catch up and, therefore, we are moving with a lag in terms of investment in research, innovation and the civil society sector. In reality, there has been no budget investment in these three growth groups over the recent years. All three groups involved in the survey rely on foreign funds or EU financing (excluding the funding from EU structural funds under national programmes) or on their own resources. Regrettably, there are no legislative initiatives to make the funding of the research ecosystem attractive to the private sector. The country is the lowest performer in this indicator, too. **Public and private financing should go hand in hand for growth of mutual interest in order to build a sustainable and attractive environment for competitiveness, to create jobs with added value to the development of regions, and to attract foreign investment in technological industries.**

Of course, the speed of reforms and development is also important. Time is crucial! In fact, the political crisis (or crises, depending on the viewpoint) has an essential impact on the knowledge sector because, in the time of a crisis, the agenda of politicians shifts to other key factors of great relevance to the public like social policy, education, healthcare, transport or regional development. These are sectors of structural importance with huge concentration of investment, including resources from the EU structural and investment funds and, of course, there is much greater public sensitivity to them. Notwithstanding the willingness and success of the innovative sector in attracting politicians from different political parties to support our aspiration for turning Bulgaria into an attractive place for investment and development of innovation and technologies, all measures prove rather limited,

insufficiently fast, underfinanced, and lacking interinstitutional support.

Next to the indicator on the underfunding and delayed reform and investment process in the EU innovation index comes a second extremely important indicator which is often ignored for the simple reason that talking about it is unpopular. It refers to human resources, i.e. the critical mass of highly skilled people in the research sector and the system of knowledge institutions (universities, institutes, high-tech companies, laboratories, specialised units). We have extraordinary personalities, leaders, researchers, innovators; we take pride in our digital entrepreneurs and inventors in the fields of artificial intelligence, satellites, optics, electronics, biotechnologies, but in reality we still lack the critical mass to make a quantum leap and to catch up by a whole decade (after all, our mission is to promote positive attitudes on the basis of the objective situation and the actual capabilities!).

There is no debate on this topic because we have no supra-partisan national human resources development strategy in Bulgaria.

We fail to shed the eternal debate “who is to blame” and thus we do not see the big picture, staring at a previous or upcoming term of office. Culprits are sought, whereas the root causes are clear and shown and told long ago by experts. Bulgaria has been losing significant resources of highly skilled and motivated people who have chosen to “vote with their feet” and quit the country ever since the early 1990s. These are one million Bulgarians, although no accurate statistical data are available, and the process has been underway for decades. Bulgaria also suffered serious consequences from what was called “the big excursion”, the massive exodus of Bulgarian citizens from the Turkish minority in the country which started in totalitarian Bulgaria back in the summer of 1989, but its impact has been felt in the following decades. **In reality, almost two million people have left the country and, as a result, Bulgaria has scored and will score the biggest demographic decline in Europe between 2020 and 2050.** Once again, our position is that these indicators and facts should be the motivators of a new way of thinking and creating policies and working conditions in Bulgaria for both our compatriots and foreign talents.

Omissions cannot be undone, but they should turn into an opportunity. The fastest model to achieve this is to invest in a favourable ecosystem which will attract young scientists, entrepreneurs, startups and innovative companies with an environment to

grow, to create jobs and to find career and family opportunities here in Bulgaria.

The rationale of laying the emphasis on the three groups involved in the survey, i.e. innovative micro- and SMEs, research units, and civil society organisations, and their development can be seen in the third important indicator, i.e. **the introduction of environmentally friendly sustainable technologies**, where Bulgaria has “tumbled” recently in the EU innovation scoreboard.

“Bulgaria faces considerable environmental challenges, particularly in transitioning to a low-carbon and circular economy. The circular material use rate averaged just 4.1% between 2021 and 2023, significantly below the EU average of 11.5%, indicating limited recirculation of materials in the production cycle. This reflects a relatively linear industrial model, despite the adoption of a Circular Economy Transition Strategy in 2022, which outlines priorities for improving material efficiency and waste management (Government of Bulgaria, 2022). Similarly, the 2024 Eco-Innovation Index score of 58.8 is less than half the EU average (127.5)”, [reads](#) the Country Profile of Bulgaria in the European Innovation Scoreboard 2025.

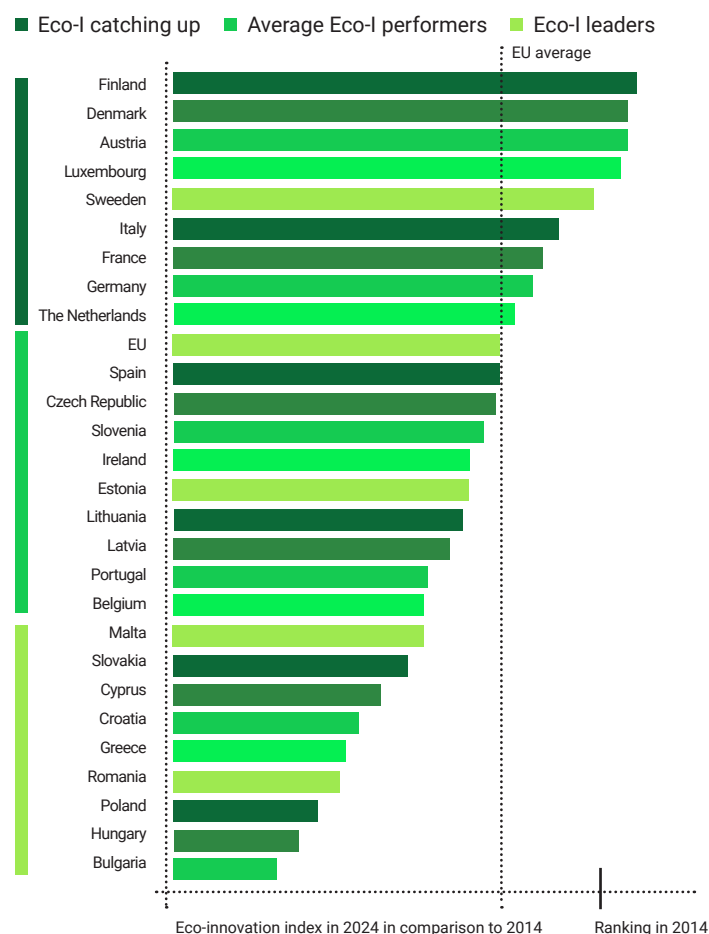


Figure 11. EU eco-innovation development index: comparison of the performance of eco-innovation systems in the Member States in 2024 and 2014. Source: © European Union – EC. License: CC.

This is one of the serious reasons for our poor performance in the European innovation ranking. Drastically delayed rates of adaptation and introduction of innovation and innovative products in small and medium-sized enterprises, adaptation to new technologies and smart management solutions, environmental technologies, energy efficiency, etc. In fact, this is the most serious structural component of both the Bulgarian and the European economy but is also the most sensitive one. Unlike big industrial companies, SMEs suffer from recurrent shortage of manpower and conditions for reskilling and upskilling, access to funding, access to offsetting facilities or to project financing. A substantial challenge for this segment will be the commitment to reduce greenhouse gas emission and the impact on the environment and climate (waste products, water use and other resources), as well as to achieve carbon neutrality or zero emissions.

This creates huge opportunities for involvement of innovative startups, micro- and SMEs in the transformation of the whole industry in general and, more specifically, in the support to a rapid large-scale introduction of eco-innovation in SMEs.

Therefore, the lagging behind in all three key spheres – investment, human resources and innovation in industry - should be reassessed very thoroughly. A courageous and inclusive common position is needed for the next five years to come. Not yet another strategy or vision but a specific action plan of the type of the plan recommended in this report.

The strategic framework is set out in the Competitiveness Compass based on the analysis in [the report by Mario Draghi on the future of European competitiveness](#). It highlights three factors needed to boost the EU competitiveness:

1. Closing the innovation gap
2. Decarbonisation of the economy
3. Reducing dependencies

A clear action plan is available on all three points, such as the proposal for a [new EU Startup and Scaleup Strategy](#), the Clean Industrial Deal and the technological sovereignty strategy specified with an action plan through the Net-Zero Industry Act: [Making the EU the home of clean technologies manufacturing and green jobs](#).

2.2. THE HEARTBEAT OF GREEN INNOVATION IN BULGARIA

This section presents the most important quantitative and qualitative results of the national survey Green Solutions from Bulgaria 2025 relating to the development, profile and main characteristics of green innovation in Bulgaria. The analysis is focused on the three main target groups – startups, innovative micro- and small and medium-sized enterprises, civil society organisations and research teams, - each of them having its unique role and contribution to the ecosystem.

Key trends (pointed out by all respondents):

- In Bulgaria, green innovation develops mainly in small structures and teams focused primarily on the circular economy and bioeconomy, the adaptation to climate change, and education and training as a cross-cutting priority for the need of skilled human resources;
- Most of innovation is disruptive or interdisciplinary, which comes to show a high level of innovation but also lack of consistent support to scaleup. The main reason is the lack of commercialisation and targeted support, for example through the introduction of disruptive innovations in existing companies and business processes. This task is quite daunting without targeted support because Bulgaria's economy generally needs incremental innovation but, for this purpose, it is necessary to have sustainable innovative companies past the startup phase towards scaleup;
- The common challenges include underfinancing, weak protection of intellectual property rights, limited transfer of technologies, weak intersectoral partnerships and international networks and, generally, difficulties in the linkage between business and research.

2.2.1. GREAT POTENTIAL, SCARCE FUNDING: THE STATE OF STARTUPS AND INNOVATIVE MICRO-, SMALL AND MEDIUM-SIZED ENTERPRISES

Context and respondents' profile

Startups are the most dynamic part of the green innovation ecosystem in Bulgaria. The survey covered 55 companies of this type, which accounted for 40.7% of all respondents. Most of them typically

belong to the category of micro-enterprises: 80% of the respondents have up to ten employees, while 52.7% have teams of one to three members, as pointed out in Part 1.2.1. This profile implies a limited capacity in terms of resources and expansion but, at the same time, a high level of flexibility and adaptability to new trends and market conditions.

Sectoral and technological focus

These companies operate mainly in the following spheres: **circular economy and waste management (60%)**, **energy and energy efficiency (32.7%)**, **climate solutions (30.9%)**, **nature-based solutions and ESG policies (23–27%)**. Other sectors like digital technologies, novel materials, sustainable construction, water management and energy efficiency are either related technological topics or interdisciplinary ones.

Innovation activity and types of innovation

Almost a half of the startups (49.1%) are working on both novel products and innovative approaches/processes, while 38.2% rely on disruptive innovations, i.e. solutions which can change the market logic and industrial structure. The same percentage (38.2%) are building on existing solutions, making them more efficient or accessible, and 21.8% are developing innovation of interdisciplinary nature and approaching new sectors.

Market orientation

There is a clear trend of shifting from end consumers (B2C) to business clients (B2B) and corporate clients: 78.2% of the startups work with other companies and 63.6% work with big clients. Only 54.5% are oriented to end consumers, while 32.7% target the public sector (B2G). This comes to reveal that the market maturity is on the growth and companies seek more sustainable and wider (in terms of productivity and markets) business models.

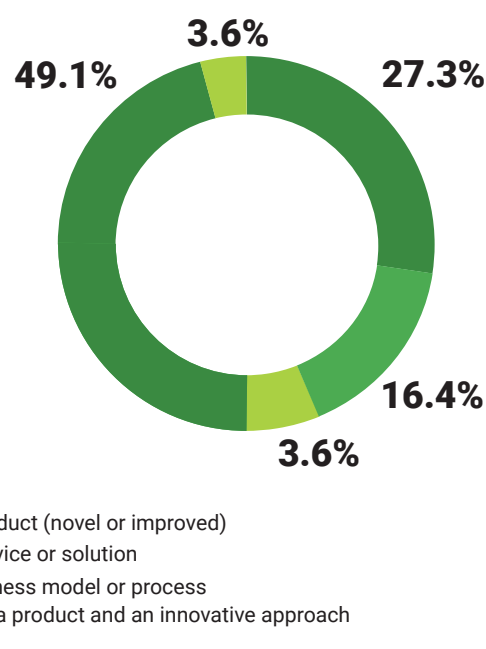


Figure 12. Where is the innovation of your company developed?
Category of micro-, small and medium-sized enterprises.

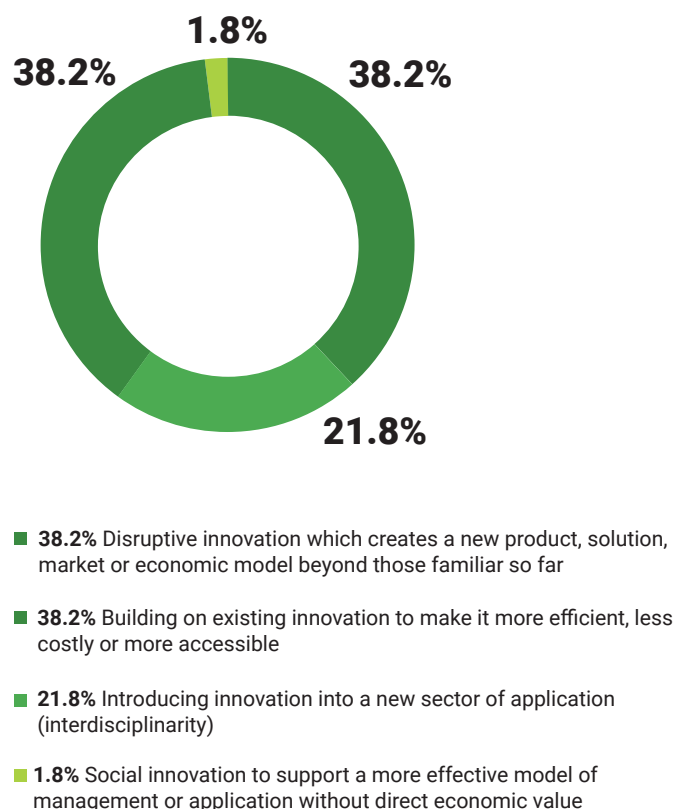


Figure 13. Type of innovation developed by your company.
Category of micro-, small and medium-sized enterprises.

Financing remains to be a key problem:

- Only 21.8% have attracted venture capital
- 41.8% have not leveraged external funding at all or do not rely on external funding

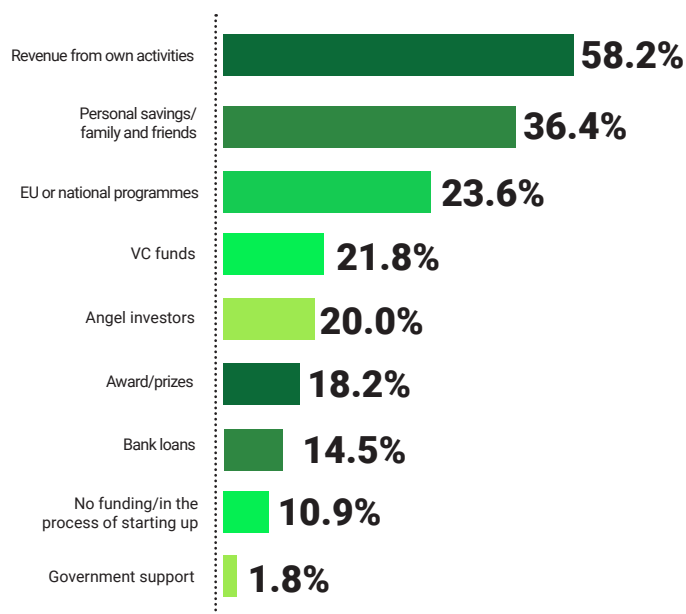


Figure 14. How is the activity of your company financed? Category of micro-, small and medium-sized enterprises. More than one answer was possible.

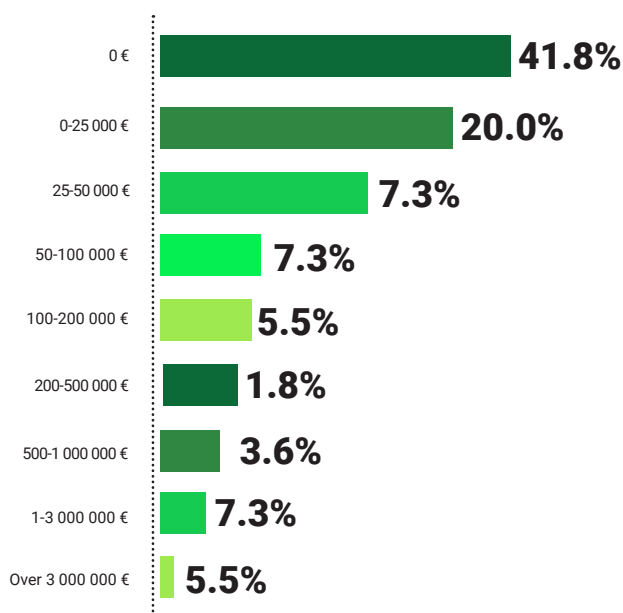
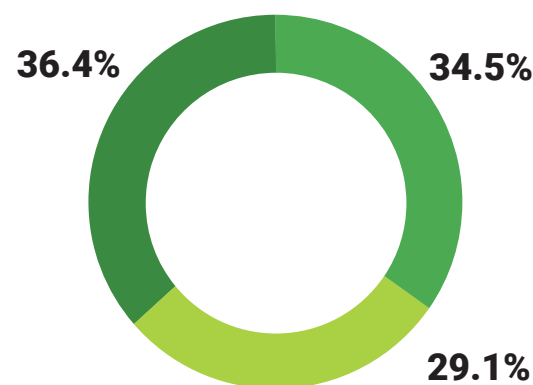


Figure 15. Amount of the leveraged equity. Category of micro-, small and medium-sized enterprises.

This strong dependence on own resources (over 50%) restricts the opportunities for growth, investment in intellectual property and international expansion. Development phases are also diverse: 34.5% are in the early startup phase (no revenues), 29.1% are in the seed phase (early revenues, minimal marketable products) and 36.4% are in the scaleup phase with a focus on expansion of activities.



- 34.5% Early stage (Concept, Early product, No revenues)
- 29.1% Seed (Marketable products, Early revenues)
- 36.4% Scaleup (Scaling revenue and customer base)

Figure 16. Development phase of the company. Category of micro-, small and medium-sized enterprises.

At the same time, **50% of the startups and innovative enterprises have no protected intellectual property rights**. This result from the survey is deeply concerning because it means, on the one hand, uncertainty in the innovation and/or invention but mostly lack of trust and interest on part of potential investors and customers. The explanation can once again be found in the lack of funding. However, given the availability of multiple instruments designed specifically to support patent applications, it would be incorrect to claim that funding is the only reason. There is a whole range of reasons, where essential factors are the lack of training, including lifelong learning programmes, the access to information and, generally, the lack of entrepreneurial knowledge and skills to be taught at school.

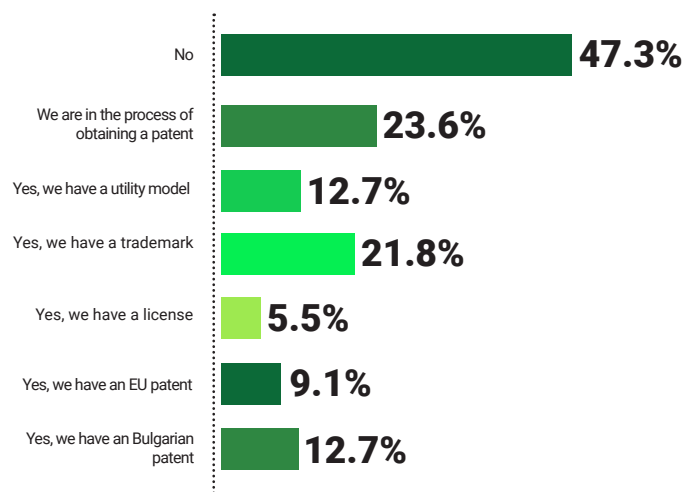


Figure 17. Are the intellectual property rights of your company protected? Category of micro-, small and medium-sized enterprises.

Participation in programmes, partnerships and science transfer

Startups which had received funding or participated in one form or another in a government-funded activity or project (mainly through EU programmes) accounted for the same share as that of the previous year (some 27.3% in 2025). Generally, companies are satisfied with the availability of support grants and assess their collaboration with the public administration working with the [programmes](#) rather positively.

The main barriers continue to be red tape, the complicated access to funding programmes, and the low level of transparency.

The results also show that the collaboration with the government is assessed primarily through the prism of the access to funding programmes, while innovators need a different type of dialogue, mainly about the need for a favourable legislative environment. A total of 38.2% of the respondents among innovative SMEs stated that as far as the development and implementation of green innovation were concerned, they were worried by the lack of environmental legislation and compliance. The lack of adequate legislation is the most typical answer to the question about the deficits impeding green innovators.

This highlights the need to develop a long-term green innovation strategy supported by legislative measures. The effectiveness of these measures can be guaranteed through collaboration between the stakeholders: businesses and civil society initiatives; academia and expert communities; and government institutions (including those entitled to legislative initiative).

Limited transfer of knowledge and technologies:

The data from the survey reveal that the successful science transfer between startups and research institutions is an exception rather than the rule. Few startups benefit directly from the output of Bulgarian academic research. There are several reasons for this situation:

- Lack of contacts and “interface” between businesses and the academia;
- Startups often develop their own solutions based on their own practical experience or international practices;
- Weak culture to license patents and use the know-how of local research institutions.

Innovative companies maintaining active collaboration with academic structures account for a small share of the respondents. The reasons are not only organisational but also related to the lack of trust, understanding or administrative support, such as:

- Insufficient skills of startups to seek and “translate” research outcomes into working business models;
- Underdeveloped commercialisation capacity of the academia; academic institutions rarely have technology transfer offices or units to communicate with businesses;
- Bureaucratic and legal obstacles: complicated licensing procedures, lack of certainty about intellectual property rights, lack of standardised agreements;
- Lack of trust and different work culture of researchers and entrepreneurs.

Bulgarian green startups are drivers of innovation and experimenters in the field of sustainable development. Notwithstanding the prevalence of small teams and substantial financial constraints, these companies are characterised by a high level of flexibility, orientation to new technologies and strategic maturity.

What they basically need is more financing support, better access to protection of their intellectual property rights and closer collaboration with researchers and the public sector so that to ensure larger-scale sustainable development of green innovation in Bulgaria.

Financing is a continual problem, and the most successful companies are those which leverage equity or have partnerships with big customers. The shift to B2B markets is a good sign of maturity, but it should be supported through specialised programmes, financial instruments and training.

2.2.2. SMALL TEAMS, GREAT IDEAS: THE ROLE OF GREEN NGOS

Civil society organisations occupy an essential place in Bulgaria’s green innovation ecosystem. Their role goes far beyond the implementation of specific projects as they are the catalyst of change, a driver of public awareness and a mainstay of civil society participation regarding the green agenda.

Profile and structure

The data from the survey show that over 70% of green organisations in this country have up to ten employees and a considerable portion of them (22.9%) work entirely on a volunteer basis, as pointed out in Part 1.2.2. This is clear evidence of the prevalence of small but highly committed and flexible structures which rely more on enthusiasm and personal contribution than on a large-scale administrative infrastructure. The sector consists of nongovernmental organisations, civil society initiatives, thematic clubs, activist groups and informal advocacy networks often operating without official registration.

Characteristics of small organisations

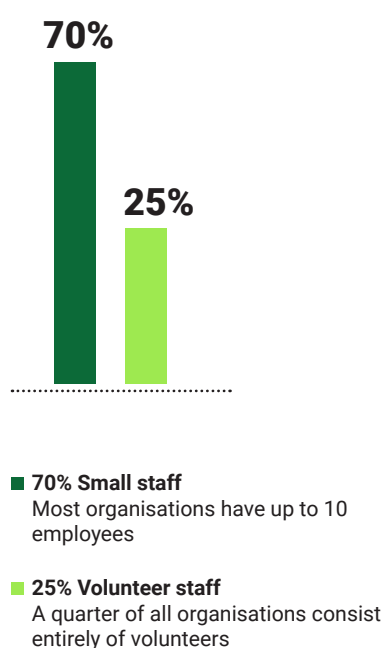


Figure 18. Characteristics of the organisations with up to 10 employees.

Innovation activity

Civil society organisations develop as an innovative sector, although they focus more on social and organisational models rather than on technological or marketable products. A total of 71% of them introduce innovation out of which 38.2% is social innovation relating to new forms of civil society participation, volunteer work or change of public services. Another 26.5% build on already existing practices and only 14.7% experiment with interdisciplinary solutions.

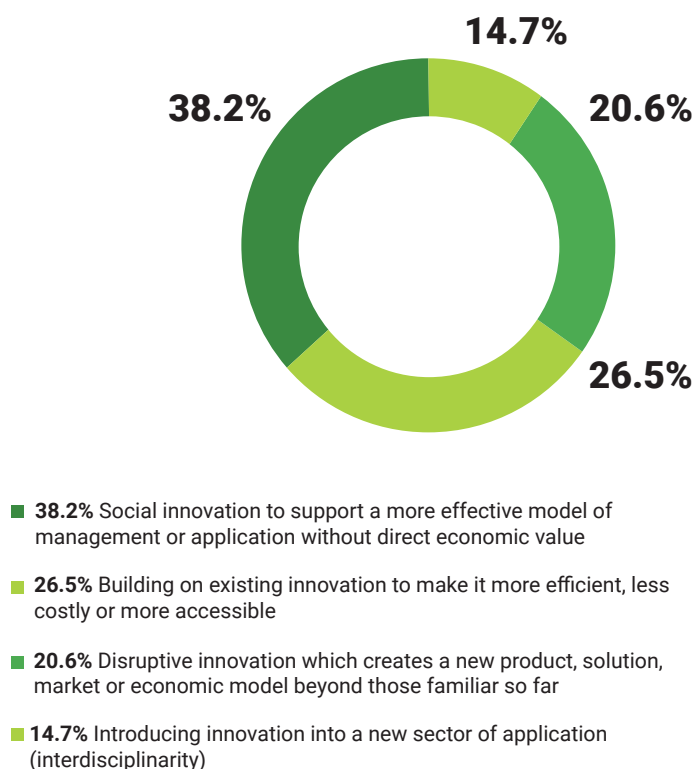


Figure 19. Type of innovation developed by your organisation. Category of civil society organisations and initiatives

The main focus is the dissemination of information and training: 85.4% take part in public awareness campaigns, 64.6% work to mobilise public support, and 60.4% organise trainings and workshops. The share of organisations engaging in direct nature restoration field work is smaller (45.8%) because this activity requires larger resources and expertise.

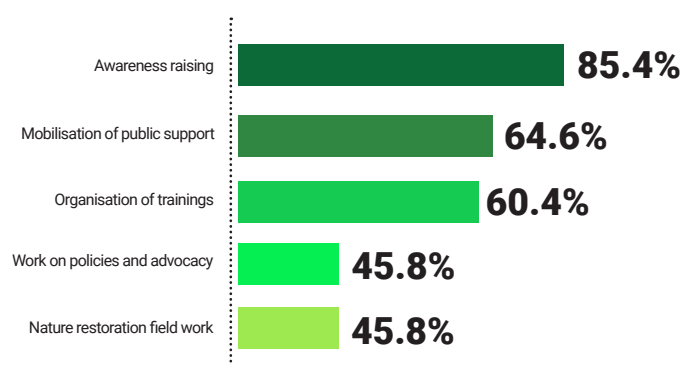


Figure 20. What type of green activities do you carry out? Category of civil society organisations and initiatives. More than one answer was possible.

Financing and sustainability

The financing of civil society organisations continues to be a major challenge. Over a half of them (54.2%) rely on EU grants and projects and a similar proportion of the organisations rely on own resources (56.3%), donor campaigns and sponsorships. Few of them have partnerships with the business community (16.7%). The barrier

mentioned most frequently by the respondents was the lack of long-term sustainable funding: 70.8% of the respondents assessed it as a crucial problem impeding their planning and sustainable development.

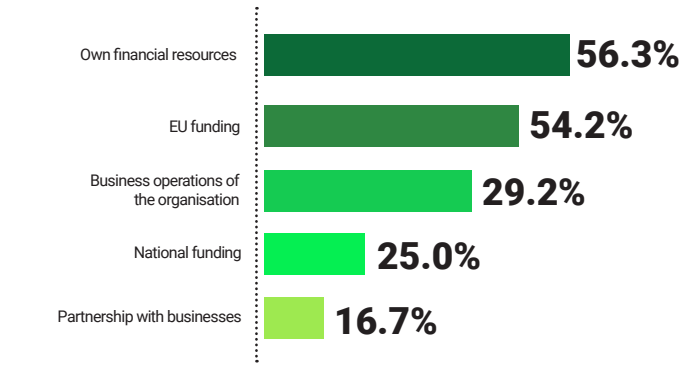


Figure 21. How is your organisation/initiative financed? Category of civil society organisations and initiatives. More than one answer was possible.

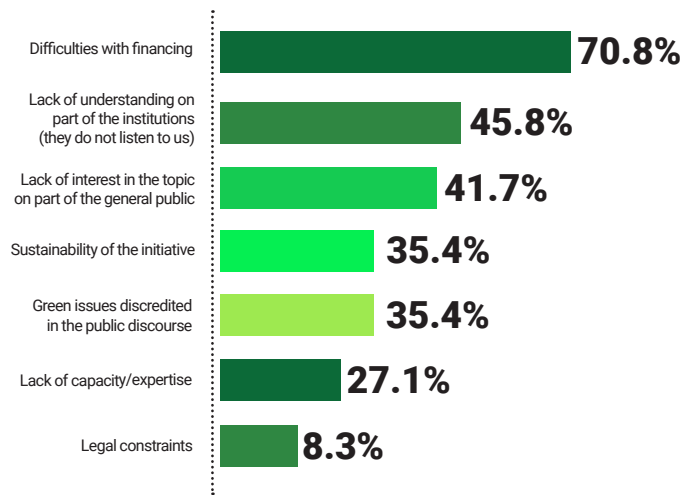


Figure 22. What are the main challenges to the development of your green initiatives? Category of civil society organisations and initiatives. More than one answer was possible.

Leaving aside programme funding, it is interesting to trace out the attitude of the sector to its collaboration with government institutions in one or another form. Both last year and this year, less than two-thirds of the respondents (64.6%) stated that they collaborated with various government institutions for the development of their organisation/initiative. As for the level of satisfaction from this interaction, the data show that positive assessments prevail over negative ones: 16.1% fully positive and 58.1% rather positive versus only 9.7% rather negative.

The comparison to the data from the previous year reveals a significant improvement and growth in the satisfaction of green organisations from their collaboration with the government. Fully positive

assessments have doubled (from 8.1% to 16.1%) and rather positive assessment have increased from 51.4% to 58.1 percent. Fully negative assessments were not given either last year or this year. There is a slight increase of the share of those organisations which assessed their interaction with government institutions as rather negative (from 8.1% in 2024 to 9.7% at present).

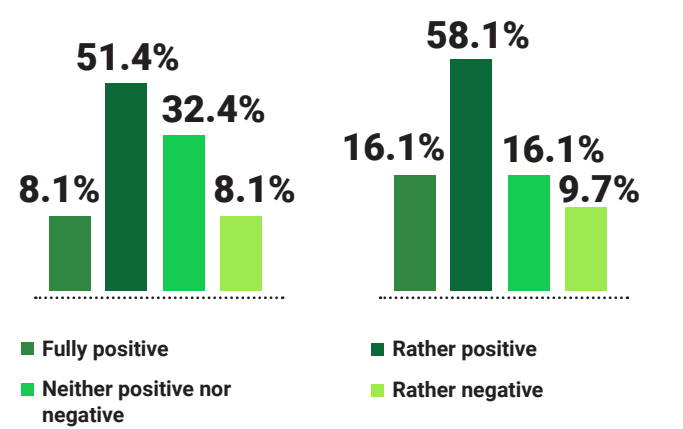


Figure 23. How do you assess your collaboration with government institutions for the activities of your organisation/initiative? Category of civil society organisations and initiatives.

Challenges and recommendations

Civil society organisations face multiple barriers: limited access to national funding, strong competition for EU resources, substantial bureaucracy and often insufficient administrative capacity. The lack of strategic interest in partnerships with NGOs on part of businesses is a constraint on the additional sources of support. Furthermore, green issues are sometimes the target of discreditation or politization in the public debate, which makes it difficult to reach out to the general public.

At the same time, the improved indicator of a positive attitude to the collaboration between the civil society sector and government institutions means that there is better understanding of the need for joint work on the challenges relating to the adaptation to climate and environmental changes and the threat to many natural resources and biodiversity. This is a favourable factor for a sustained dialogue aimed at developing targeted green innovation policies and raising the awareness and knowledge of eco-innovation and eco-technology issues among all generations of citizens and stakeholders.

In response to all these challenges, the sector gave its clear recommendations in the survey. The idea to set up a **National Green Fund** gained the biggest support (70.8%) so that to ensure stable and predictable national financing.

Local advisory boards, access to new funding programmes and easier access to existing ones like the structural funds and more transparency were identified as urgent needs for supporting and developing the sector:

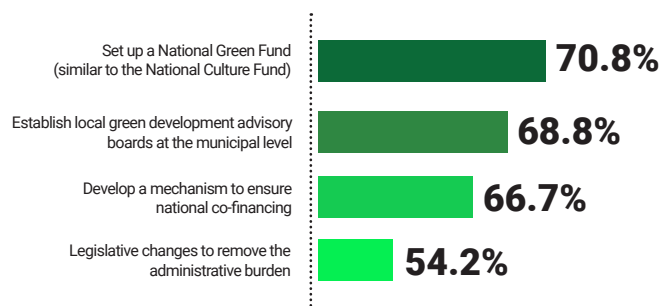


Figure 24. What government support measures are needed in your opinion? Category of civil society organisations and initiatives. More than one answer was possible.

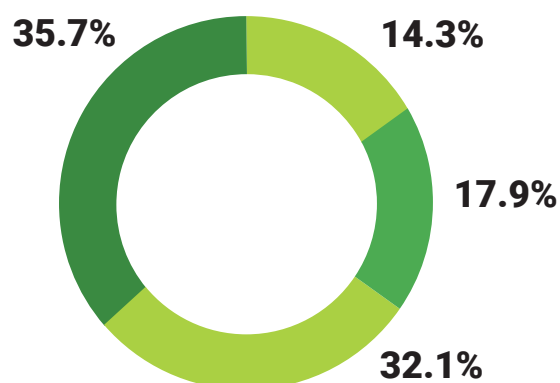
Civil society organisations are a key catalyst of social change. They generate knowledge, build a sustainability culture, exert pressure on institutions, and set up networks of committed individuals. Without their activity, green innovation would be much more difficult to accept and implement on a large-scale and policies would be much less legitimate and sustainable.

2.2.3. NEW IDEAS, LIMITED CAPACITY: THE IMPORTANCE OF RESEARCH PROJECTS AND ORGANISATIONS

Research teams and organisations play a particularly important, albeit often underestimated, role in the green innovation ecosystem. They are the source of new knowledge, basic scientific discoveries and technological advancement which are all indispensable to sustainable development and the transition to a green economy.

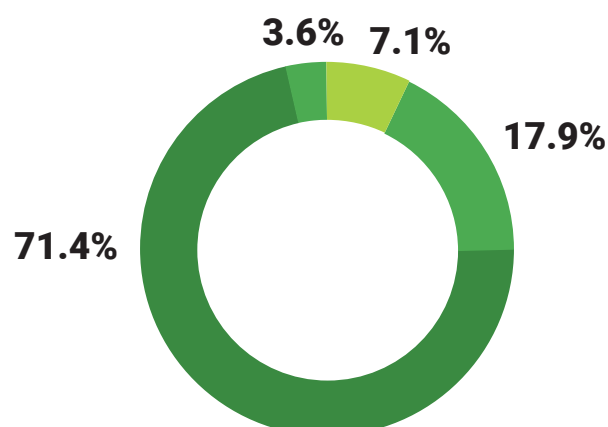
Innovation activity and transfer

Research teams demonstrate a high level of innovation activity: 88% of them work on new development. Innovation is often interdisciplinary (32.1%), which means introduction of solutions from one field of science into another. Besides, 71.4% of the teams develop “combined” innovative products and processes which balance between basic and applied research.



- 35.7% Building on existing innovation to make it more efficient, less costly or more accessible
- 32.1% Introducing innovation into a new sector of application (interdisciplinarity)
- 17.9% Disruptive innovation which creates a new product, solution, market or economic model beyond those familiar so far
- 14.3% Social innovation to support a more effective model of management or application without direct economic value

Figure 25. Type of innovation developed by your research project. Category of research projects and organisations.



- 71.4% In both a product and an innovative approach or process
- 17.9% In an innovative approach
- 7.1% In a product
- 3.6% Other

Figure 26. In what of the items listed is the innovation of your project developed? Category of research projects and organisations.

A quarter of market-oriented research outcomes reach the commercialisation stage. More than a half of them (53.6%) remain isolated in the academic sphere. The main reasons for this situation are the lack of capacity and experience with transfers to industry (46.9%), the weak links between science and business (31.3%) and the lack of specific skills but also the lack of specialised technological infrastructure to test and develop demo projects and technologies. Hence the lack of trust on part of potential investors, partners and businesses. It

should be added that there is almost no targeted policy to “export” research outcomes abroad, while the domestic market has no capacity of absorbing new technologies or at least such capacity is not available all the time. In this way, the weak internationalisation (only 50% of research teams work on international projects) leads to substantial inability to achieve transfer of research results to the benefit of the economy and society.

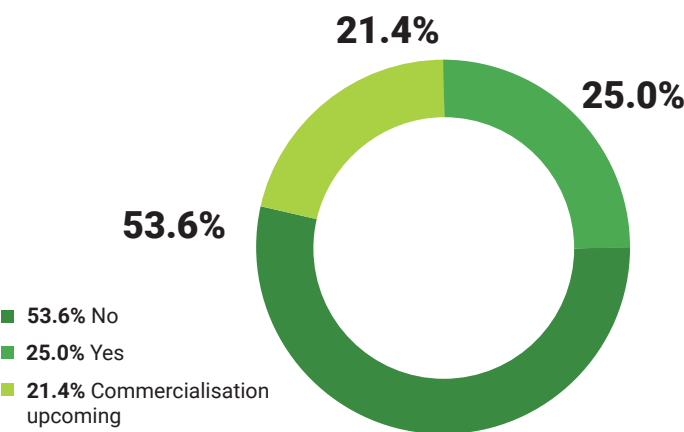


Figure 27. Has your innovation been transferred to business and/or another sector? Category of research projects and organisations.

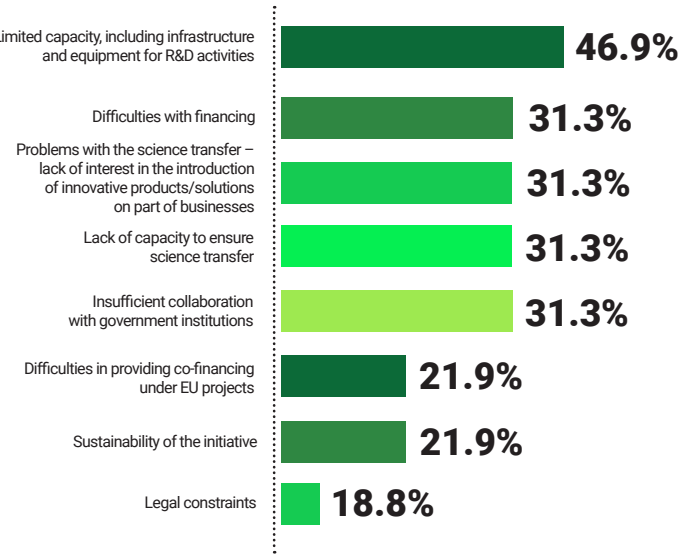


Figure 28. What are the main challenges for the development of your project? Category of research projects and organisations. More than one answer was possible.

Research funding is almost entirely dependent on public sources, which is only natural. But only 50% of the teams take part in international teams and apply for funding from EU programmes. This is a sign of weak internationalisation. Some respondents stated that they were unable to take part in larger-scale research due to lack of human resources and national co-financing. Only 18.8% of the projects received funding from the private sector which cannot be extrapolated to the entire

sector. The relatively high percentage is due to the fact that the survey involved research teams in the field of the circular economy and bioeconomy, and their projects had been contracted by industries. Generally, the interest on part of businesses to directly invest in research remains low.

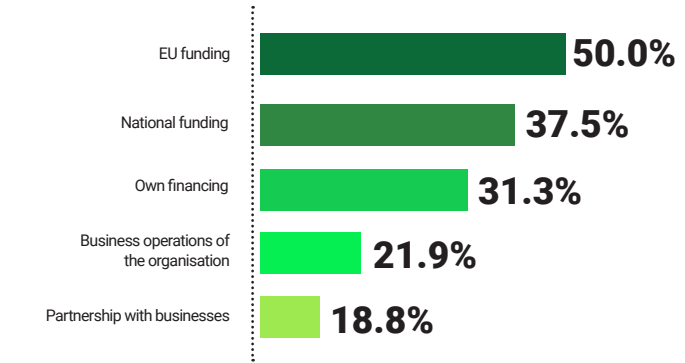


Figure 29. How is your project financed? Category of research projects and organisations. More than one answer was possible.

As for the protection of intellectual property rights, 56.3% of research teams do not use any form of protection. Even where attempts are made to obtain patents, typically they mean trademarks or national patents, whereas international and EU patents are the exception. It is arguable whether they or specialised units at the academic institutions should engage in this task, and it rather depends on the strategy of academic units. Generally, there is a risk that innovation could remain uncaptialised or be appropriated by third parties but generating and maintaining patents cannot be a goal in itself for research teams. This is the role of spinoffs, startups, and innovative companies.

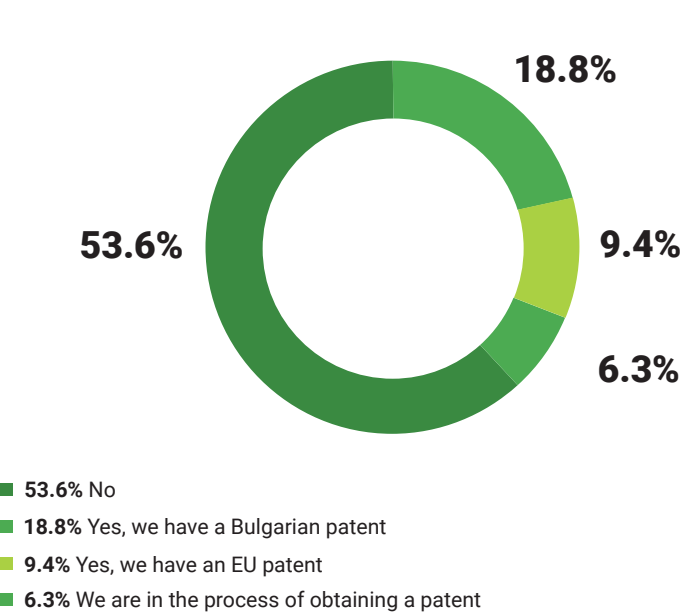


Figure 30. Are the intellectual property rights of your project protected? Category of research projects and organisations.

Innovation needs not only inventions but also an environment linking them to the market, to people, and to real solutions.

The main problem still lies in the weak collaboration between science and business, the lack of the culture, working rules and legal awareness needed to engage in joint development, although other countries have been promoting this practice, e.g. contract research, for years. The prevailing attitude in this country is that businesses should be proactive and seek the results of research work instead of working together. The opposite attitude also exists, i.e. researchers are expected to be proactive and seek business collaboration opportunities. Both attitudes are wrong. The intentions of some institutions to obligate academic units to actively pursue such collaboration are also misplaced.

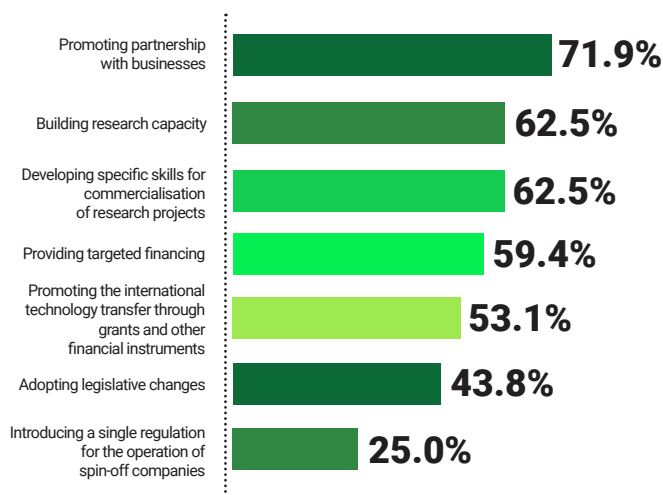


Figure 31. What do you think needs to be done to improve scientific transfer in Bulgaria? Category of research projects and organisations. More than one answer was possible.

In reality, the process could provide conditions for mutual trust, investment in training and mutual understanding of the benefits from high-quality research and reliable data and, conversely, from business processes, capital markets and financial instruments. Next, it is important to have liaison offices and a clear policy and commitment to set up one-stop shops or technology transfer offices that guarantee the interests of researchers and provide business services. Innovative companies often need assistance and access to specialised infrastructure, which implies not only opportunities for testing their materials but also access to data, computing models, and targeted research support in developing and testing new technologies.

Last but not least, greater opportunities are needed for targeted funding of the collaboration between industries and the academia, for increased

funding of spinoff companies, side by side with improvement of the legal framework and other measures.

Role in the ecosystem

Research organisations are a pillar of the innovation ecosystem which is indispensable to the real transition to green economy. Despite all their constraints, they continue to generate ideas, new solutions and technological base. However, for their full potential to be unleashed a more active linkage is needed with international research organisations and between research institutes, universities and industries in Bulgaria.

This is the way to create a critical mass of green technology and innovation professionals, shared understanding and knowledge of the legal environment and the key strategic documents, as well as access to the global knowledge on the development in the climate sector. As a matter of fact, the whole support to the transfer of knowledge and technology and to commercialisation should be remodelled through targeted programmes, training and access to information. What is often ignored about training is that managers of research institutions, policymakers and lawmakers, and public sector employees who are in charge of the academic sector and higher education should also be trained so that to enhance the policies and measures of assessing the quality, outcomes and productivity of the sector. They should be able to make a clear distinction between the real collaboration with industries and transfer of technology, one the one hand, and the collaboration in training, organisational processes or services to industry that are typical of research institutes, on the other hand.

Both civil society organisations and research projects are indispensable pillars of the green innovation ecosystem, the former with their societal impact and the fostering of public support and the latter with their fundamental knowledge and opportunities for technological advancement.

The green transition will remain only a good intention and will never be translated into reality without the active linkage between research, industry, the civil society and the public sector.

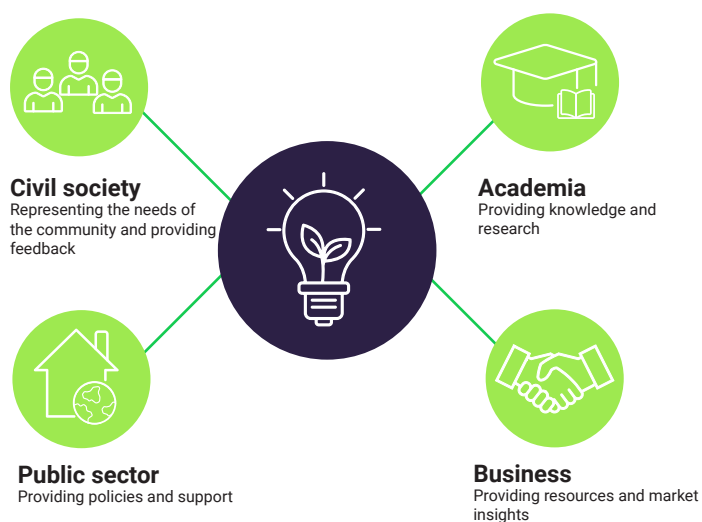


Figure 32. Benefits from the quadruple helix commitment.

2.3. QUESTIONS WITH AN EYE TO THE FUTURE

Guided by our wish to look beyond current issues and to try and “see” the future, we decided to add two questions of a forecasting type to the survey Green Solutions from Bulgaria 2025.

In fact, **envisioning sustainable futures** is one of the four competence areas in [GreenComp](#), the European sustainability competence framework developed by the Joint Research Centre (JRC) of the European Union. GreenComp is addressed to policymakers, educational institutions, trainer training organisations, assessment and certification bodies, employers, and research organisations.

Question 1: Skill and knowledge gaps which are constraints to development

Our first question links the current challenges facing green initiatives and their capabilities of moving forward and making adequate decisions for the future.

Question 2: Which emerging technologies or trends have the greatest potential for green innovation in Bulgaria?

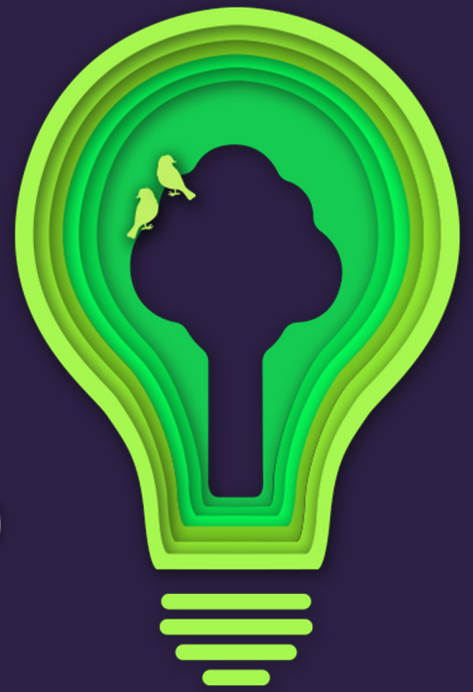
The second question referred the three groups of respondents to their forecast on which technologies and trends had the greatest potential to develop and implement green innovation in Bulgaria based on the experience of the relevant respondents: small and medium-sized enterprises, civil society organisations and initiatives, and research projects and organisations.

	Innovative micro-, small and medium-sized enterprises in the startup or scaleup stage	Green organisations/initiatives	Research projects
Sustainable design and materials science	20.0%	25.0%	9.4%
Expertise for life cycle assessments	18.2%	25.0%	15.6%
Renewable energy technologies	7.3%	14.6%	9.4%
Principles of the circular economy	16.4%	6.3%	25.0%
Environmental legislation and compliance	38.2%	25.0%	34.4%
Preparation and management of “green” projects	20.0%	31.3%	40.6%
Analysis of data on the environmental impact	21.8%	27.1%	43.8%
Financial skills, computing, modelling	21.8%	35.40%	28.1%

Figure 33. Which are the biggest gaps in skills or fields of knowledge in your company when innovation is developed and implemented? Data on all three categories of respondents. More than one answer was possible.

	Innovative micro-, small and medium-sized enterprises in the startup or scaleup phase	Green organisations/initiatives	Research projects
Biomass and bioenergy solutions	34.5%	33.3%	46.9%
Advanced photovoltaics	12.7%	22.9%	21.9%
Smart network technologies	7.3%	22.9%	15.6%
Energy storage systems	25.5%	27.1%	18.8%
Circular economy practices and waste-to-resource technologies	61.8%	75.0%	68.8%
Precision farming with IoT and AI	21.8%	31.3%	28.1%
Carbon capture and utilisation (CCU)	20.0%	16.7%	12.5%

Figure 34. Which emerging technologies or trends do you consider having the greatest potential for green innovation in Bulgaria? Data on all three categories of respondents. More than one answer was possible.



CHAPTER 3:

GENERAL CONCLUSIONS

AND RECOMMENDATIONS

3.1. AFTER THE SURVEY: A VIEW BEYOND DATA

All groups are unanimous that the circular economy and the technologies used to transform waste into resource have the greatest potential to develop and implement green innovation in Bulgaria on a short-term basis. The other sectors highlighted in the report should not be excluded either, **but it is necessary to make thorough research into green innovation in terms of specific spheres and in terms of their relationships with or dependence on specific technological and research sectors.**

Generally, the development of technology and innovation is largely determined by the existence of an **adequate legal framework and funding, both programme funding and venture capital, including the use of various financial instruments.** For example, the banking sector looks much more favourably at eco-innovation in enterprises which improve the use and reuse of resources, enhance energy efficiency, reduce resource dependence, introduce smart management, and similar practices. On the other hand, projects related to climate innovation and environmentally friendly products with strong social or environmental focus depend primarily on the interest of the public sector and society rather than on market principles in the early stages of their development. As a result, such projects often advance more slowly, and consequently innovative companies fail to expand.

The circular economy and waste recovery technologies seem to be the most realistic way toward green innovation in this country on a short-term basis.

The second crucial factor which determines the orientation of technological development or investor interest to one or another sector is the political environment and will, coupled with external factors like Bulgaria's participation in the single European market. Within the framework of the European Green Deal and the implementation of the National Recovery and Resilience Plans, the main emphasis was laid on energy efficiency, including innovation in energy technologies, the circular economy, and recycling. **However, the new political programme of the European Commission is focused much more on the need for developing and implementing innovation and technologies to support nature restoration.**

In July 2025, the European Commission proposed the establishment of a market for nature credits, [a new instrument to promote investment in the protection, restoration and sustainable management](#)

[of natural resources and biodiversity.](#) Nature is the main asset for the economy, health and prosperity of society. Nevertheless, the underestimation of its role leads to loss of ecosystem services, threatening economic stability and sustainability.

Nature credits will be voluntary market tools which will enable participants to demonstrate and monetise nature-positive action beyond their regulatory obligations.

The proposal to establish a model of certification as an independent process of assessment and recognition of high-quality, nature-positive actions in line with pre-defined criteria, will certainly have an impact on our ecosystem, as well. If there is a will to implement these models quickly and to take active part in their development instead of remaining passive observers, Bulgarian research teams and innovators are very likely to propose potential solutions in this field.

The establishment of a market for nature credits is a strategic tool that correlates economic value to ecosystem protection actions.

Of course, this new model of promoting investment in eco-innovation will depend not only on political will but also largely on the development of **dialogue and trust between private investors, civil society organisations, academia, and innovators with government support.**

The adoption of a **comprehensive approach to the development of climate policies based on data and investment in science and innovation is crucial.** Climate-related policies are intertwined and relate to multiple sectors, while innovation and investment in new technologies is a horizontal priority in almost all EU policies.

As for programme tools, both those managed centrally by the EU institutions and those implemented at the national or regional levels, all of them comply with the target of allocating at least 35% of investment to climate goals. This requires regular coordination of national policies, strategic documents and legislative acts with the EU strategic documents in this field to ensure that priorities, objectives and funding activities are in line with the current legal, political and technical frameworks.

It is also necessary for the relevant institutions to be better informed about the available instruments and strategic documents in other sectors to ensure **stronger synergies and better alignment of innovation development tools and better awareness.** This, in turn, will contribute to a

more effective civil society dialogue and active participation of businesses.

The European Green Deal Advisory Board and its commissions are, undoubtedly, a positive step toward better alignment and coordination of policies and actions in different sectors but they are not effective enough for the time being. In fact, there is no real communication and dialogue with innovative micro-, small and medium-sized enterprises (SMEs), research units and the civil society sector which have only fragmentary representation through individual organisations and sectoral structures.

A further step is needed **to establish a permanent live connection between all stakeholders in the process of developing and implementing green innovation and environmental solutions.** Instead of relying just on online public consultations, a more flexible targeted dialogue with the sector is needed not only to receive feedback but also to influence, inform and incentivise society and business. This also includes private financial institutions which need to build trust and investor interest.

The process needs to be supported with clear leadership and joint action on a common platform where opportunities and responsibilities intersect and where **specific solutions are discussed to ensure rapid and high-quality implementation of new technologies and innovation in industry and in society.** All this is needed for the effective adaptation to climate change, the restoration of the environmental balance, and the opening of opportunities for new business and markets.

The evolution of this approach to management, synergy and development should build on a **clear process of data collection and definition of distinct and measurable indicators to monitor progress.** There is no need to invent new indicators. Instead, an open and responsible dialogue should be conducted on the existing indicators described in this report, i.e. the two EU indexes of eco-innovation and the innovation scoreboard of Member States. Discussions, trainings and meetings should be dedicated to these indicators so that to clarify who reports what and how the relevant data are generated.

Even the best green policies will remain only on paper without a live connection and intersectoral exchange of knowledge.

A registry should be set up to collect information on the green technology and innovation developed and introduced, covering the results of all three major groups, i.e. nongovernmental organisations,

research units, and businesses.

Another recommendation which was strongly advocated by the respondents for its potential to substantially speed up the transition to a more favourable environment for innovation development and implementation is to establish **local green development advisory boards.** More than two-thirds (68.8%) of the civil society organisations and initiatives support the establishment of such boards at the municipal level. The involvement of local authorities is crucial in the process, and they already have taken up a specific role. For example, the territorial plans contain a separate component on climate change, within which many environment-related challenges have been identified, including water, soils, forests, biological and animal diversity.

Various targeted measures are available to promote the implementation of civil society initiatives, as well as initiatives of local authorities. Still, these actions do not always follow the general guidelines set out in the territorial plans as they depend primarily on the initiative of local communities.

Green innovation cannot be implemented and developed spontaneously. It should be guided, tested and introduced with the awareness and commitment of all stakeholders. However, municipalities often depend strongly on the central budget; they have limited administrative capacity, and some regions lack proactive civil society organisations. Research units and universities, too, are concentrated in only a few regions and they cannot provide the necessary knowledge, solutions, and even pressure to cope with specific challenges everywhere.

Therefore, a pragmatic approach is recommendable: **advisory boards should work on the identification and mapping of specific problems in their region and propose targeted action to tackle climate change or environmental challenges.** For instance, it could be possible to use “innovation public procurement”, i.e. municipalities publish tenders for resolving a specific environmental problem through an innovative technological solution. This would create a fast market for the introduction of proven and tested innovations that have not been commercialised yet.

Another effective mechanism can be found in the model of civil society science, in which citizens take part in the collection of data for specific studies by means of, inter alia, mobile applications to measure and report, for instance, environmental indicators.

It is also necessary to reassess the budget in order

to ensure investments for the implementation of various activities and to attract private investors, industries, and research teams. This can be achieved through the establishment of a **National Green Fund** focused on civil society initiatives and projects with the opportunity to have tenders and assignments not only at the national level but also in the regions.

Parallel to its operation, it is necessary to reassess the establishment of targeted programmes and clearly defined climate goals within the framework of other public funding facilities, for example the Research Fund or the National Innovation Fund. The former could programme thematic initiatives like industry-promoted missions or studies, whereas the latter should develop programmes for various innovation sectors, including green innovation, and for different levels of technological readiness and commercialisation.

The sustainable financing of green innovation requires not only EU resources but also a national financial framework.

The dependence on EU structural and investment funds for funding civil society initiatives, research and innovation is far too high and, at the same time, insufficient on its own. Programmes are focused on specific goals, and they cannot always fill in the vacuum in public support or private investment. Therefore, the strategic documents envisaging a certain percentage of the GDP for research and innovation should include a special segment dedicated to climate and eco-innovation as is the case with centrally managed EU programmes.

One of the first legislative measures should be the introduction of the definition and practice of “innovation public procurement” and some specific tax incentives to attract private investment in public research results and in financial instruments. Besides, it is important to build a sustainable public-private innovation partnership model with the participation of the government and businesses that is similar to the EC joint ventures.

Startups and innovative companies emphasize on the need for new financial instruments to attract venture capital in the green innovation sector. At present, the prevailing instruments are seed and angel investments focused mainly on software, IoT, artificial intelligence, and smart solutions. The interest in technological innovation, however, remains limited, and government intervention is needed anyway to cover part of the risk.

There are high expectations pinned on the new

Technology Transfer Fund but, once again, it is programmed with EU funds. Therefore, its long-term sustainability should be achieved through national budget financing. A key function of this Fund or similar programmes should be to facilitate the transfer of research results to business and to ensure access for innovative companies to research data, services and infrastructure. This implies not only awareness and strengthening of the dialogue between the academia and businesses, but also real support to joint research and development of services to help test and demonstrate projects of startups in the green innovation sector.

The recommendations coming from the research sector are in the same context of the three basic elements of a modern and adequate environment for the work of researchers and engineers: infrastructure, equipment, and human resources. Researchers are aware of the fiscal capacity and the challenges in other sectors, but they seek predictability. This is the most substantial recommendation: even if investments are attracted to the provision of equipment, including computing machines, and to the improvement of the infrastructure, what they need is measures to renovate and upgrade the working environment. It is not only the government but also the academia that should have a clear strategy for the development of the research infrastructure. They need to prioritise and have an action plan, to work together and develop a critical mass. The critical mass implies the availability of highly qualified human resources in various fields, especially in the sectors of climate, biodiversity and farming, where Bulgaria has always scored very good achievements but targeted funding of human resources in the system has been missing for years. At the same time, there is an ever-greater need for people trained in interdisciplinary sectors. The number of researchers should double or treble in the key sectors, particularly in bioinformatics, biotechnologies and engineering, and this requires good training infrastructure.

More programme tools are needed for green innovation development to support startups and innovative micro-, small and medium-sized enterprises, the technological infrastructure, the environment to develop and test technologies and products, and to attract human resources. To this end, individual programmes and institutional funds should collaborate to identify both opportunities and gaps and to plan targeted measures and funding for the following years – the next three years to come on a short-term basis – and to work out a model for dialogue and planning on the long-term basis.

Over 70% of the respondents recommended that

measures should be planned to increase the opportunities for participation in international programmes and/or entry into international markets. In fact, most of the stakeholders who made that recommendation are beneficiaries of EU funding or participate in other donor programmes, representatives of the civil society sector in particular. Still, they see the need for changing the model. This means that Bulgaria should encourage local innovations to reach out internationally. Our research results should develop in international teams, and we should set models for climate change or civil society participation. Multiple Bulgarian nongovernmental organisations have been awarded international prizes for excellence and added value to the community. But this is typically the result of external funding and it would be difficult to achieve sustainability or scale up the activities.

Parallel to the measures to get involved in international programmes and EU projects, there is the need to commit national co-financing, as well. During the new programme period, most programmes and projects require at least 50% co-financing with the idea to attract private funding to the implementation of research results developed with public funds. The need for co-financing is an important component of sustainability, promoting the responsibility and entrepreneurship of beneficiaries. Nevertheless, startups and micro-, small and medium-sized enterprises are left on their own and they, just like the NGO sector, have no access to such support. Researchers are faced with lack of institutional support or rather lack of prioritisation within the academic units so that to support those teams which have the potential to reach technological commercialisation. Other Member States have models to provide co-financing through legislative changes or financial measures based on tenders or other models of selecting high-quality potential projects to support.

All new programmes and measures to support new technologies, innovation, collaboration, trainings and local initiatives should go parallel to deep-going changes in the application procedures with a view to simplification and reduction of the bureaucratic burden. Although substantial progress has been achieved, the administrative and expert assistance regarding awareness, applications or project preparation is insufficient. As for the promotion of projects in the field of climate and the environment, clear commitment is needed on part of the national institutions responsible for Bulgaria's participation in EU flagship programmes like Horizon Europe, the Innovation Fund, LIFE and others, where the targeted expert assistance is almost non-existent

at the national level. There is no single portal to all programmes, but it would be appropriate for the Managing Authorities to be aware of the centrally funded EU programmes, as well.

Training, skills and lifelong learning

Support the strengthening of the innovation capacity, starting with programmes for training and development of innovative companies, especially regarding spinoffs of research teams and those in the scaleup stage. Develop commercialisation skills not only in the field of patents and other intellectual property rights but also in business modelling, management, data accessibility and management, marketing, and financial instruments.

The enhanced protection of intellectual property rights is crucial. A half of the innovative companies claim that they do not have a protected patent due to the lack of time, information or resources. Although there are many free instruments such as webinars of the European Patent Office or meetings and trainings organised by nongovernmental organisations or VC funds at the national level, this segment of innovators should be a special target group. They work in small teams and, more often than not, they cannot afford to take part in one-month programmes. It is also worth noting that that information in the social media remains encapsulated within separate groups or individuals interested in the topic and advertising trainings or uploading useful learning materials there does not necessarily mean that the advertisement will reach those who need it.

The appeal of all three groups of respondents in the survey is to get targeted awareness raising campaigns and trainings not only for startups and young researchers but for the whole ecosystem across the board from training of emerging innovators to training of leaders and managers to present climate strategies and legislation, to build strategic skills and models of managing public private partnerships, and to develop collaboration with businesses and private investors.

There is a critical need for sustainable follow-up of the efforts of the civil society sector to raise awareness and provide training and for various educational initiatives concerning green policies. Over 60 % of the activities in the nongovernmental sector consist of trainings of diverse groups in the community and of target groups affected by climate change. The mobilisation of local volunteers and environmentalists to support local communities is another measure that requires persistence and growth. Last but not least, more information,

campaigns and training in the education system are needed. Sustainability can never be guaranteed through international programmes only or through national funding alone, which makes it crucial to identify the points of intersection between the private sector, the government, and civil society initiatives.

3.2. RECOMMENDATIONS SUMMARY

- **Establish a green innovation development board** – its membership should include representatives of all stakeholders, including ministries, municipalities, scientists, civil society organisations, big business, SMEs, and the financial sector. The board should be administered by the Ministry of Innovation and Growth (MIG). It should be a statutory body to ensure its greater independence and resilience to political changes
- **Analyse Bulgaria's potential to develop green innovation and work out a strategy based on the analysis** – to be developed by the Green Innovation Development Board described above
- **Conduct a campaign to position Bulgaria through green innovation** – to be organised by the Ministry of Innovation and Growth
- **Develop an online platform dedicated to climate and decarbonisation policies**, e.g. a National Climate Portal to publish and continuously update information on climate policies and decarbonisation policies, how they affect specific stakeholders (by categories of SMEs, municipalities, etc.), and what funding opportunities exist by category of stakeholders (SMEs, municipalities, etc.). Publish information on how climate change affects Bulgaria with a breakdown by indicators: territorial units (mayoralities, municipalities, regions); demographic indicators (children, adults); economic indicators (sectors and economic units like SMEs or big businesses). Publish also information on climate adaptation and how individual groups in society should prepare for the manifestations of climate change, for example, what a period of prolonged heat or floods means to individual economic sectors and how it impedes their normal operation, what should be done to continue production operations in case of water scarcity, power outage or shortage of resources (e.g. in the case of prolonged severe storms disrupting supply chains and the mobility of workers or how to ensure normal working conditions and proper storage of products and raw materials in prolonged heat)
- **Develop a national platform providing access to capital for green innovation** of the one-stop-shop type. The platform should be developed and administered by the Ministry of Innovation and Growth (MIG)
- **Develop a platform for digital tracking of green investment**, including blockchain technologies. The platform will ensure transparency and encourage more investors to join the support to green innovation. The platform should be developed by the Ministry of Innovation and Growth or one of the entrepreneurial organisations like BESCO or BVCA
- **Establish a national green innovation framework and maintain a public registry of innovative green initiatives** to be developed and administered by the Ministry of Innovation and Growth
- **Introduce measures to better integrate Bulgarian entrepreneurs in EU programmes** – develop a training programme on how to apply for funding from EU innovation programmes. The programme should be established at the MIG and operate on a permanent basis with at least to training sessions per year to be held either in regional centres or online. Set up permanent advisory centres, e.g. through a new version of the business incubator model
- **Optimise the existing technology transfer offices** and encourage the opening of new ones to safeguard the interests of researchers and, at the same time, develop business services
- **Establish a Green Fund** within the framework of the Fund of Funds for targeted investment in green innovation
- **Ensure the long-term sustainability of the Technological Transition Fund** through central government budget financing
- **Introduce green verticals in venture capital funds**
- **Introduce a mechanism to encourage banks** to offer incentives for the development of green industrial innovation
- **Set up a National Green Fund focused on civil society initiatives and projects** with options for tendering and operation not only at the national level but also at the regional level

- **Introduce a national co-financing mechanism under international programmes and EU projects.** During the new programme period, most programmes and projects require at least 50% co-financing with the idea to attract private funding to the implementation of research results developed with public funds
- Analyse the **administrative barriers to the development of green innovation.** The analysis should be carried out by the National Green Innovation Development Board
- Develop a **roadmap to remove the existing barriers.** The roadmap should be made available by the end of 2025
- **Update targeted programmes and clearly define climate goals within the framework of public funding facilities related to climate policies and decarbonisation policies,** for example the Research Fund or the National Innovation Fund. The former could programme thematic initiatives like industry-promoted missions or studies, whereas the latter should develop programmes for various innovation sectors, including green innovation, and for different levels of technological readiness and commercialisation
- Similarly to the EU, the strategic documents at the national level should **introduce an obligation for a minimum percentage of the GDP to be allocated to research and innovation related to climate and eco-innovation**
- Build a sustainable model of **public private partnership to develop and implement innovation with the participation of the government and businesses, following the example of EU joint ventures**
- Set up a working group to **hold a public awareness campaign on the benefits of the nature credits roadmap** proposed by the EC. The working group should include representatives of civil society organisations, academia, entrepreneurs, equity funds and venture capital funds
- Introduce a **statutory obligation to ensure scientific justification of proposed primary and secondary legislation** relating to the implementation of climate policies and decarbonisation policies
- Increase **budget investment in research and innovation** to achieve climate targets and decarbonisation targets, emphasizing on the support to the implementation of innovation (allocate resources for the implementation of innovation and not only for the development and promotion of research)
- Consider **specific tax incentives to attract private investment** in the development of eco-innovation by research units
- **Coordinate the efforts of the Bulgarian Academy of Sciences and universities** – they should join their efforts to develop green innovation in the priority areas for Bulgaria as identified in the strategy described above. The coordination should be supported by the Ministry of Innovation and Growth and become a priority of the new **Innovation and Research Board**
- Introduce a permanent **mechanism for regular coordination of national policies, strategic documents and legislative acts with the EU strategic documents** in the field of climate policies and decarbonisation to ensure the alignment of priorities, targets and funded activities to the current legal, political and technical framework
- Set up **regional green development advisory boards** with representatives of businesses, science, the civil society, and municipalities. The relevant regional administrations and the National Association of Municipalities in the Republic of Bulgaria should support the establishment of these boards and administer them. The advisory boards should work on the identification and mapping of specific issues in their regions and propose targeted action to address climate change or environmental challenges
- **Set up municipal green innovation development boards,** bringing together representatives of the business sector, science, the civil society, and municipalities. The Ministry of Innovation and Growth and the National Association of Municipalities should support the establishment of these boards
- Introduce **innovation public procurement** for municipalities to publish tenders for resolving a specific environmental problem through an innovative technological solution. This would create a fast market for the introduction of proven and tested innovations that have not been commercialised yet
- Set up a **platform to connect schools, universities, ministries and municipalities** to

exchange information and promote cooperation in finding innovative solutions to specific challenges facing ministries, regional governors and municipalities

- Work out a **national strategy and a roadmap for the development of green innovation accelerator programmes at universities**, including support to spin-off companies with protected rights of young entrepreneurs. Provide central and/or local government funding for the implementation of their ideas
- Develop a **national strategy to attract young people to key specialties** related to the implementation of climate policies and the management of natural resources
- Implement **urgent measures to make engineering a more attractive choice for students**
- Develop a mechanism to **attract university students to laboratories**, including collaboration with secondary schools and visits by pupils

3.3. IN LIEU OF A CONCLUSION

Bulgaria can speed up its green transition by means of:

- An integrated approach to the management of climate policies and collaboration and transparency of sectoral policies;
- Systematic support to innovative SMEs, civil society organisations and research units;
- Incentives for collaboration and knowledge transfer;
- New mechanisms to provide long-term funding and involvement of the private sector.

Thus, the country will benefit from the new sustainable growth opportunities and improve its position in European and global innovation rankings.

KEY HIGHLIGHTS:

Financial sustainability and security

- The economic stability and food security are in direct correlation to the health of nature and ecosystems.

Innovation and new business models

- The development of nature credits opens new market opportunities, promotes innovation, and fosters sustainable growth.

Coping with global crises

- Nature-based solutions are crucial for tackling climate change, the loss of biodiversity and pollution.

Opportunities for local communities and economies

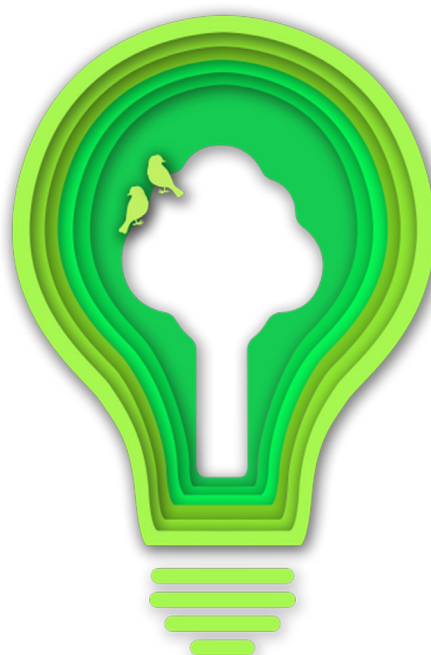
- New revenue sources and incentives are created for the people committed to the conservation and management of natural resources.

The risk of inaction

- A continued loss of nature would cause substantial economic, social and environmental damage that would be difficult to set off in future.

LOOKING FORWARD

This study is not merely a snapshot of the current situation. It is a strategic roadmap: the accelerated investment in capacity, the adaptive legislative environment and coordinated partnerships are key prerequisites for turning green ideas into sustainable economic solutions.



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