

GREEN TECHNOLOGY INOVATIVE CLUSTER ASSOCIATION’S STRATEGY

I. WHY GREEN TECHNOLOGY INOVATIVE CLUSTER?

Environmental pollution’s challenges are threats for Planet Health and its people. The water, air and soil quality alteration, the noise pollution and the great radiation damages, all life-threatening, are becoming the duty of each individual to prevent environmental disasters and maintain a clean environment. To this end, more ingenious people have constructed ingenious environmentally friendly technological solutions. It could be the key to saving the planet?

The resources needed to survive are often consumed unnecessarily, leading to significant losses. Also, the recycling of materials is not or can not be used is an important issue, because they can be reused for building new objects, useful, topical, by the latest technology.

For these reasons, it is absolutely necessary to develop green technologies through a holistic innovation approach to sustainable use of resources and to sustainable development processes. In order to consume a minimum amount of resources to achieve maximum results and at the same time to contribute to protecting the environment and to preventing or to combating natural disasters that threaten the planet, it has to be created and developed more and more green friendly technologies environment inventions, to create positive prospects for socio-economic life of the planet.

Green Technology Innovative Cluster is part of this process, by its composition and its directions of strategic development, identified with its members, aiming to facilitate their cooperation in terms of maximizing the impact of research and innovation on their activities and to create value chains of actions of its members to meet in a synergistic way the global challenges.

II. THE CLUSTER IDENTITY

II.1. Identifying reference areas of interest

Green Technology Innovative Cluster is responsible for coordinating all activities and the joint initiatives of its members, the services offered and distributed them naturally. This distribution comes both from the specific mission of each organization and its history. Green Technology Innovative Cluster cluster composition is resumed in the following table:

Cluster structure by member	20 members (15 SMEs, 2 R&D institutes, 2 NGOs, 1 NGO of public interest)
Small companies (<50 employees)	2
Micro-entreprises (<10 employees)	13
R&D Units	2
NGOs (of public interest)	1
NGOs (of non-commercial activities)	2
Total number of employees	250
Total members income	24.340.839

The Cluster's Members:

1. Centrul de Chimie Organică "C.D. Nenițescu" al Academiei Române

Description: Part of the research structure of the Romanian Academy, Center for Organic Chemistry "C. D. Nenițescu" is performing the research-development in organic chemistry, coming from the former Institute of Chemical Research of Bucharest. Benefiting of a team of specialists with long experience in applied chemical research supported by a modern infrastructure and a significant portfolio of projects and themes for innovative research, in partnership with SME, The Center of Organic Chemistry is a promoter of entrepreneurial initiative, which brings a specific and particular innovation to bio-economy, in line with the current market trends and of modern society.

2. Camera de Comerț și Industrie Brașov – Reprezentanța Făgăraș

Description: Established in 1992, as the first entity of Chambers of Commerce in Romania who works in another locality than the county residence, the representative Fagaras is an active player involved in creating, developing and maintaining a modern and flexible business environment, in line with economic and social environment novelties and which catalyses the innovative local entrepreneurial initiatives. The Representation has particular expertise in the training of labor force, related to current labor market needs and it has the requested infrastructure for this. Also, by helping SMEs and individual entrepreneurs in developing and implementing the projects financed from European funds, the Representation can offer an important contribution to the implementation of cluster innovative ideas.

3. Societatea Natural Ingredients R&D S.R.L. Făgăraș

Description: Established in 2011, the company carries out R&D activities in the field of innovative technologies for the manufacture of chemicals based on natural herbs and wild flora. The company also is a skilled partner in developing professional R&D&I projects, implemented in collaboration with research units in Romania or into transnational programs.

4. Societatea Agricola Medicinale 2002 S.R.L. Sâmbăta de Sus

Description: The company is engaged in the collection and the recovery of medicinal and aromatic plants, both spontaneously environment and its own certified organic crops, with the objective of adding value to products through the application of innovative technologies for processing environmentally friendly.

5. Societatea Andronic Company S.R.L. Sâmbăta de Sus

Description: The company has extensive experience in trading flowers and landscaping, as well as growing flowers and aromatic herbs.

6. Asociația "Păstrăvarii Făgărașului"

Description: The Association was established in 2013 as a local action group aquaculture (FLAG) and brings together local authorities (11 municipalities) and contractors, specialized in raising trout in the north of the Fagaras Mountains. Through its experience in financing activities of its members through a multfiles project of the Fisheries Operational Programme 2007 - 2013, the Association represents a useful member towards integrated projects, that cluster can perform and it is an experienced actor in implementing technologies concerning the trout growth, in terms of ensuring biodiversity conservation and natural microclimate for it.

7. Societatea Bauhaus Arhi S.R.L. Braşov

Description: The company has a core group of designers specialized in industrial projects on valorisation of renewable energies (wind, photovoltaics) and specific industrial design objectives (production halls, warehouses, farms).

8. Societatea Calistar S.R.L. Braşov

Description: The company benefits from the experience of a particular group of experts for recruitment and selection of personnel and training for it. Also, its portfolio includes consulting activities and business management, the successful implementation of a project training transregional, setting up an industrial park and a business incubator – a specific experience, useful in projects to be developed through cluster.

9. Societatea Custosolar S.R.L. Bucureşti

Description: As the representative in Romania of the German group Custosolar, the company promotes efficient energetic products and innovative technologies for producing renewable energy, offering integrated systems for it, including planning and detailed design, turning on and distribution. The company has a large experience to manage complex projects, from initial analysis to service and maintenance.

10. Societatea Gaz Energy Ecotherm S.A. Făgăraş

Description: The company's main objective is efficient and responsible use of energy resources, and is an important provider of heat and electricity from a cogeneration plant of high efficiency, by an environmentally friendly process, that enables increased productivity in exploiting energy, in compliance with the environment protection and preservation regulations.

11. Societatea Green Led S.R.L. Braşov

Description: Named by its products quality and performance, the company is a promoter of confidence measures for environmental protection, by efficient use of electricity, and an experienced partner for applying innovative technologies for the manufacture of lighting elements.

12. Institutul de Cercetări pentru Instrumentaţie Analitică Cluj Napoca

Description: The Institute is a multi-disciplinary applied research center, with large experience on agriculture/nutrition, environmental protection and health, clean technologies, bioenergy, biomass and advanced materials, with various applications (nanomaterials, nanocomposites, environmentally friendly materials for construction) and certified of chemical analysis services and evaluation. The Institute is directly involved in supporting entrepreneurship and SMEs through Technology Transfer Center CENTI-ICIA and the project portfolio shows it as a dynamic partner in innovative applied research, as basis of development activities of cluster members.

13. Societatea Medisan 2010 S.R.L. Mediaş

Description: Established by research results transfer from an applied research institute to an SME (through a START-UP programme), the company is an important pillar of the cluster, in terms of their expertise in translating to concrete practice of the chain research-production and it is a model of good practice for creating innovative SMEs, through technology transfer from the R&D&I units to industrial companies and their dynamic business areas.

14. Societatea New International SRL București

Description: With an experience of over 20 years in the marketing of compositions of fragrances, essential oils, flavorings and natural extracts, the company brings significant support cluster members in achieving the objectives of economic performance, by access especially in the niche areas of the European market, which can exploit the natural products with high value.

15. Societatea Nutraceutical SRL Săcele

Description: Established in 2000, the company is an active SME in research of aromatic herbs, with specific applications in developing innovative technologies for the manufacture of extracts and concentrates of active ingredients and producing herbal teas. Also, by research contracts and partnerships with research units in Romania and the EU, the company represents an useful partner of the cluster, its implemented projects being examples of good practices for other members.

16. Societatea Pro Air Clean Ecologic SA Timișoara

Description: The company has the infrastructure and a special experience on waste management, having one of the most modern plants in Europe, using the best available techniques for incineration of a highly wide variety of wastes (including hazardous) and a highly efficient purification technology for wastewater treatment and burning gases. Moreover, the company has an accredited laboratory for evaluation of wastes and of the environmental factors and has a particular expertise in the recycling and recovery of byproducts and industrial waste, by application of innovative technologies with reduced environmental impact.

17. Societatea Regiu Plant SRL Sfântu Gheorghe

Description: The company is specialized in collecting and primary processing of medicinale herbs and of the fruits of wild flora, having a certification and the needed infrastructure to obtain quality product with highly content of active principles.

18. Asociația Producătorilor și Procesatorilor de Plante Medicinale și Aromatice din România (ROPAM)

Description: The Association represents the interest of producers and processing companies of medicinal herbs, promoting its members into projects to bring added value to the members' products. As a member of the European profile association – Europam and by its participation in a couple of transnational projects on medicinal herbs, the Association is offering to the cluster, several channels of dissemination of information and projects for highly valorisation of the raw materials from wild flora.

19. Societatea Snailbox SRL Râușor

Description: The company is specialized in selection and improvement of varieties of herbs, having experience in assessment of content of active principles of herbs and in the in-vitro multiplication technique, for preservation of the qualitative features of the propagating material, which fits into agriculture crops needs.

20. Societatea Style Advertising SRL Făgăraș

Description: Having a 12-years experience in advertising, the company has a large client portfolio, to confirm expertise and skills of its personnel, by finding the most appropriate message for a product and to create its most adequate image and brand for a market succes.

II.2. CLUSTER SWOT ANALYSIS

Strengthening

- The increasing number of partnerships between SMEs with R&D units
- The development of activities with high added value
- The significant individual experience of the cluster's members in industrial research and experimental development, including access to public financing
- The individual experience in international cooperation of the cluster's members
- The priority allowed to bioeconomy and the circular economy at national and international level

Weakness

- The unstable market for SMEs
- The lack of a system of professional education in the cluster's member areas of activity
- The lack of the needed expertise of personal training, requested by green industry

Opportunities

- The importance of research & innovation within the EU and the national development strategies
- The Romania's real economic growth (slow, but stable)
- The financing programmes for clusters at European level
- The dynamic trans-regional strategic partnership creation

Threats

- The initial under-financing for launching the cluster operational activities during the preliminary period (the first three years)
- The bureaucratic barriers, due to clusters of specific legislation, poorly correlated with economic reality and the European development strategies
- The thematic lines of green technologies and the technical skills are not covered by the overall cluster members
- The lack of direct connections, clear and solid at European level, to extend cluster skills

III. CLUSTER STRATEGY

III.1. Cluster's Pillars

A. Biorefining

A first cluster action line is the development and the optimization of innovative technologies and of the efficient processes, through research and development, in order to build a pilot plant for bio.

The cluster will apply innovative technologies to obtain products with high added value, such as natural substances and biomaterials. Their integration with local features allows the creation of sustainable production systems, particularly through access to primary resources, while the direct cost and impact on the environment are relevant.

B. Renewable resources as raw materials

An important part of the cluster efforts will be directed towards identifying the most appropriate local resources, such as byproducts or dedicated crops, which constitute the raw materials for green technologies, developed to obtain products with high added value. The cluster will stimulate the building of high value chain from agriculture, the high valorisation of local resources and the optimization of the use of their positive effect on rural community development and for environmental protection.

C. Natural Products

The research-development and implementation of their results are being determined directly by the market trends and the cluster priorities include the development and the promotion of bio (obtained fully or partially from renewable raw materials), the low impact on the environment has advantages as well as economically and socially.

D. Waste Treatment and Diminishing of Pollution

The research-development is aimed at promoting techniques for the treatment of waste waters, gas and wastes by environmentally friendly based active methods or other combined systems with similar action, able to reduce or to eliminate organic and inorganic pollutants, by their conversion into non-polluting materials.

E. Framework for R&D Activities

There is a strong current global conversion of industrial sites in biorefineries for the production of bioproducts from renewable resources. Cluster falls within this context, as a coordinator for sustainable economic development, to perform R&D activities, contributing to increase the investment in innovative technologies and into pilot plants.

III.2. Strategy's General Objectives

A. Encouraging investment in green technologies

Given the current migration of investment from developed countries to emerging countries and the risk of loss of investment in research and innovation in the production of bio, the cluster represents an opportunity for achieving a viable development model, based on innovation and on transfer of know-how from research to production lines, on a competitive market. Special attention will be given to green technologies combined with nanotechnology, meaning high value technologies for environmental protection (water and air purification, remediation and soil conservation) and of the construction area (insulating materials) and renewable energy.

B. Promoting a green economy through an integrated research-production-chain market

The cluster aims to relaunch investment in research and innovation, leading to the development of green technologies for the production of bio-based raw materials, available and cost competitive, with economic and social benefits.

The cluster would enhance and focus the efforts of its members in terms of maximizing opportunities for cooperation between them, identifying the main areas of research and innovation, to develop and to strengthen current activities in a coordinated way, to speed up the achievement of results and valorisation on local, regional and European markets.

C. Increased competitiveness and preservation of natural resources

A major challenge for GREETINC in bioproducts is to formulate economic and sustainable production processes, capable of leading to products with high value, to justify investment in research and innovation efforts.

Thus, the cluster will act in the following directions:

- Use dedicated crops and the agro-industrial by-products to increase eco-agro-industrial system compatibility;
- Sustainable management of agricultural ecosystems by exploiting plant residues and compost, thereby creating opportunities for additional income in rural areas;
- Promoting the development of new processes and green technologies, to enable efficient use of raw materials and the low environmental impact.

D. Promoting the green economy through an integrated value chain cluster members

The chain of individual cluster members skills will be integrated at joint projects, which will valorise the expertise and the infrastructure of R&D units and the SME skills and industrial capabilities, integrated with those of SMEs providing specialized services (design, training, promotion, marketing, recovery and waste recycling) and dissemination of successful projects through NGOs channels.

The management of cluster initiatives aims to be a tool of organizing its services closely related to explicit and implicit needs of its members, to increase the mutual benefit of all the parties.

III.3. The specific objectives of the strategy

On medium and long term, the GREETINC cluster intends:

- To create a common framework for green bio-economy, in line with market trends;
- To support continuous interaction between its members and the market, in order to implement innovative projects with significant impact in the field of green technologies;
- To contribute to the creation of partnerships for the implementation of innovative applied research projects with significant impact on its members;
- To promote the testing and the experiments for the production of bioproducts and validation of the research at pilot plant and industrial level;
- To encourage the synergic integration processes between agriculture, food, chemical areas, engineering and design and management of byproducts / waste;
- To offer its members the opportunity to identify additional skills and the additional resources to valorise on market the outcomes of innovation projects

IV. Cluster specific actions which will develop its projects related to:

- Identify the needs of local, regional and European markets, concerning the green innovative technologies and products and the building a database with this information;
- Identify potential users (beneficiaries and / or funders) of green technologies and innovative products and the building a database;
- The development of green technologies for the collection and the processing of spontaneous invasive plants and putting them in application, in order to obtain natural substances with high economic value;
- The development of bioinnovative technologies and products for natural feeding of animals, birds and fish farming (aquaculture);
- The promotion of biodynamic farming and of actions to improve soil quality by using natural products (extracts, compost);
- The development of specific technologies for valorisation of biogenic and household wastes, by their neutralization and usage in energy production;
- Creation and maintaining of a national database to track and to control the movement of biomass from agriculture, forestry and food industry;
- Design and construction of civil and industrial buildings and production plants with "zero emission";
- The development of environmental technologies for better use of sludge from wastewater treatment and achieving a pilot plant
- The performing of investment for Cogeneration for Biomass;
- The valorisation of the wasted thermal heat within equipments and thermal machinery for agriculture and industry;
- The promotion of "green tourism" and the promoting of the concept of "green business, non-

destructive" for the benefit of biodiversity and of local communities;

- The establishment of a center of excellence in green technologies, for knowledge improvement and the certification of specialists in research, development, design and implementation of green technologies

V. SOCIO-ECONOMIC IMPACT

The aim of the cluster strategy is to stimulate the promotion of local growth and development through innovation, and the performing of actions to create significant job opportunities. These processes are basic means for the revival of local and regional competitiveness, through the newly secured locally created jobs, where investments are made and their associated developments.

VI. SYNERGY OF THE STRATEGY WITH THE NATIONAL AND COMMUNITY POLICIES

GREETINC cluster strategy is a tool designed to programmatically define its objectives - built on the specific needs, identified at local and regional level, in closed correlation with the development directions of national and Community, eligible for the resources and the financing means, included in their plans and programmes.

Among its priorities, the GREETINC cluster strategy identifies the bioeconomy and the biotechnologies as priority items in its agenda and aims to shift their approach to funding programs (Horizon 2020, cohesion funds) for green technologies and bioproducts. The cluster is like a key-tool for achieving the link with European funds and cohesion funds, through a coherent policy to facilitate the involvement of its members by stimulating their actions, in synergy with local and regional characteristics and potential.

Also, through its objectives, the GREETINC cluster strategy is a tool that aims activating development policies of its members, in line with national and European strategies, that can inspire their work.