



Deliverable 3.3.1

Testing Report (Sixth Reporting Period)

Responsible Partner: AFIL

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List of abbreviations

LP: Lead Partner

ACMM: Associazione Cluster Marche Manufacturing

SRIP: Strategic Research and Innovation Partnership

TPLj: Technology Park Ljubljana

PTP: Pomurje Technology Park

DIH: Digital Innovation Hub

RCM: Region Central Macedonia

CIE: Cluster Intelligent Energia

CCE: Croatian Chamber of Economy

1. Executive summary

This deliverable is the sixth report of testing activities and it provides a final update of the status of testing activities implemented by testing partners from Central Macedonia, Croatia, Slovenia and Auvergne Rhone Alpes who are trained in each phase by coaching partners, namely CNR-STIIMA, EURECAT and AFIL.

As already described in the previous reports, testing activities started at the end of second reporting period and the first steps were implemented in the third reporting period, during which partners focused their effort on setting the framework of Vanguard Initiative, raising awareness on GREENOMED objective and methodology as well as on identifying stakeholders interested in participating to regional working groups focused on specific topics of interest related to Green Manufacturing. Then during RP4 GREENOMED testing partners proceed with the events and workshop dedicated to Vanguard Initiative and GREENOMED project dissemination and started the orchestration of regional working groups. Indeed, after the topics identification and the set-up of the core groups, partners organised meetings during which companies and other stakeholders interact and further details the themes of interest. In RP5, the implementation of the GREENOMED methodology steps continued with the consolidation of the regional working groups with the aim to increase the critical mass of the members participating to the groups and align their effort toward the definition of a concept note for the development of a pilot plant project. Moreover, testing partners continuously monitored the wider group of regional stakeholders raising awareness on the opportunities related to Vanguard Initiative and identifying new potential priority topics to be developed with the final goal to commit more and more stakeholders toward the activities related to the working groups. Finally, during RP6,

This final period represented for the partners an opportunity to continue in the implementation of the methodology steps allowing the progress of working groups toward specific innovation projects based on regional and interregional collaboration. Moreover, most of the partner exploited these last months to further investigate and make concrete the participation of their stakeholders to the Vanguard Initiative, integrating them in some existing demo-case networks.

During the GREENOMED Final Conference in Milan, partners had the opportunity to present the main results of the testing activities implemented during the project lifetime, following the steps of the methodology. Besides the report of the outcomes generated, the Final event gave them the opportunities to invite at the table policy makers from different region and point out the main challenges faced while promoting collaboration and innovation in the regional ecosystem as well as sharing strategic and operative recommendations with regional authorities.

As largely highlighted in the previous reports, testing activities proceeded at a different speed and with diverse actions among testing partners. This need of customising the



implementation of the GREENOMED methodology is mainly due to background situations and initial status of the different regions. Accordingly, partners were coached one-to-one to couple with the different problems each of them faced and every single step of the methodology was eventually adapted to the partners' peculiarities.

As a result, progresses and achievements reported in this final report are extremely different and not in all the cases activities have led to the elaboration of a business plan for the innovation projects defined within the working groups. Although it was not possible to achieve homogeneous results, each testing partner has achieved a progress in its regional ecosystem and has shared and formalised a collaboration methodology that will contribute to continue implementation actions beyond the project closure in a structured and coordinated way.

Summarizing, this deliverable collects the updates of testing activities achieved in the sixth reporting period by each testing partner. After a recall of the main objectives and the approach proposed to the testing partners, the core part of the report is represented by the progress of testing activities in each Region, focusing on i) Vanguard framework setting, ii) Identification of key topics iii) Establishment of regional core group, iv) Motivating ideas, v) Consolidation of the regional working group. In particular, when discussing the progresses achieved in the establishment of regional core groups, partners were required to focus on the companies involved in testing activities so far, mentioning the type of support provided to each of them and an estimation of the costs for the services delivered.

In conclusion, the information related to the 6th reporting period were completed with the actions planned, building opportunities and new collaboration on the outcomes achieved in GREENOMED project.

2. Objective of the activity

The objective of activity 3.3 is to test and qualify the trans-regional cooperation methodology developed within GREENOMED project to provide an application-ready and transferable trans-national set of tools, procedures, activities and services to be exploited by Clusters. Thanks to this methodology, Clusters will be able to offer a consolidated mix of activities for the identification and implementation of innovation actions in the field of green manufacturing for the setup of trans-regional pilot plants projects.

Once tested and optimised within the GREENOMED context, the methodology could be transferred to other targeted Regions and to ensure a sustainable exploitation Regional Authorities could be involved in transferring activities.

3. Approach towards testing GREENOMED methodology

“Testing” within the context of the GREENOMED project comprises the utilization of the trans-regional cooperation methodology by the Clusters of the concerned Regions in order to assess its sustainability, appropriateness, application readiness, usability and effectiveness.

Accordingly, Clusters are the focal actors for the testing of the methodology, for which they implemented activities targeted to regional stakeholders’ group on the basis of the workplan defined in D3.2.1. Indeed, they are coordinating a collaborative process for the bottom-up intra-regional identification of priority innovation projects in the area of green manufacturing on one side. On the other side, they are supporting trans-regional cooperation with other Clusters to identify synergies with projects that will emerge in other Regions. CNR-STIIMA, EURECAT and AFIL, who are the experienced partners, are supporting other participants in the implementation of the methodology with frequent bilateral meetings and participating to “testing events”.

As already reported in the previous periods, the execution of the testing activities has been anticipated by a set-up phase, in which the scope of the testing and the role of the different partners have been clearly pointed out. Then, in period 3 the concerned Regions started the implementation of the testing activities with a slight delay with respect to the initial workplan elaborated. This delay was mainly attributable to the so called “Vanguard framework setting” which took more time than expected and consequently lead to an overall delay of the following activities. Once consolidated the common understanding of Vanguard Initiative and identified the role of each Region as well as the opportunities to be sought within the network, partners started the activities related to topics identification and regional working group establishment.

Although general guidelines were provided by the methodology, each region is implementing such activities slightly differently taking into account regional priorities, industrial needs and culture. Accordingly, in the following paragraph a detailed description of the activities implemented and the related results is presented by each region.



Beside tools and methods provided, the experienced partners in their role of coaches ensured a dedicated support to the partners testing the methodology. This support is consisting on frequent bi-lateral calls to guide decisions on next steps to be performed, participation to events and workshops and alignment with regional working group as well as with Vanguard network. Finally, as summarised in **Table 1** to maximise the impact of this coaching action, each “experienced partner” has been assigned to a “testing partner” on the basis of synergies among regional topics of interest.

Table 1. Coaches assigned to testing partners

Testing partner	Coaches
Plastipolis (<i>Auvergne Rhone Alpes</i>)	EURECAT (<i>Catalonia</i>) - STIIMA-CNR (<i>Lombardy</i>)
Associazione Cluster Marche Manufacturing (<i>Marche</i>)	STIIMA-CNR (<i>Lombardy</i>) – AFIL (<i>Lombardy</i>)
Pomurje Technology Park - Technology Park Ljubljana (<i>Slovenia</i>)	STIIMA-CNR (<i>Lombardy</i>)- EURECAT (<i>Catalonia</i>)
Croatian Chamber of Economy - Cluster "Inteligentna Energija" (<i>Croatia</i>)	EURECAT (<i>Catalonia</i>) - AFIL (<i>Lombardy</i>)- STIIMA-CNR (<i>Lombardy</i>)
Interbalkan Environment Center (<i>Central Macedonia</i>)	STIIMA-CNR (<i>Lombardy</i>)

4. Progress of testing activities

4.1. Marche Region

4.1.1. A general overview of the Region status quo & Smart specialisation strategy

As already mentioned in the previous reports, Marche Region context is characterized by a widespread industrial manufacturing system, where the integration between research and production represents an opportunity to increase growth and development across the territory, enabling the valorisation of qualified human capital.

The regional industrial system identified 4 cross-sectorial fields (Home automation, mechatronics, sustainable manufacturing, health and well-being), where ICT and digital technologies are applied as transversal tools. Recently, the circular economy topic has received considerable attention worldwide because it offers an opportunity to optimise and promote sustainable production and consumption through new models based on continuous growth and limitless resources.

However, the existence of several barriers within the regional territory towards the implementation of circular economy practices by SMEs have to be reiterated.

These barriers are mainly cultural and financial. Indeed, they are related on one side to the lack of knowledge and competences about circular economy, its benefit and impacts on the other side to the lack of incentives from the Regional and National government to implement these concepts in their manufacturing processes.

To overcome these barriers within the regional context, ACMM constantly cooperate with the regional political authority in order to improve the knowledge about the benefits of the circular economy, and support in the definition of Regional S3, mapping specific stakeholders interests. Considering the regional overall situation, the development of Pilot Plants still represents a real opportunity for the local territory to boost green manufacturing, by creating strong synergies and collaboration among local stakeholders. Companies, Marche Region, the ACMM Cluster, universities and research centres will gain several benefits from this action initiated within GREENOMED project. Indeed, Thanks to the Pilot Plant initiative, considerable critical mass has been produced around the sustainable and intelligent factory keeping in mind that the ultimate goal of the Pilot Plant project is to empower innovators and entrepreneurs to develop green and eco-friendly solutions for companies.

4.1.2. Vanguard framework setting

Within the Vanguard framework setting, ACMM were able to raise awareness around the Vanguard Initiative through events, meetings and activities. At the beginning, the concept of Vanguard Initiative and its goals were not known by the Region and local stakeholders.



Thanks to GREENOMED project, ACMM continued to organise dedicated event and workshop during the project lifetime, to overcome this gap. In particular, during RP6 ACMM took part in **“Remake Festival”, the 5th and 6th September 2019, in Fabriano.**

During the event, Vanguard Initiative has been presented, in order to raise awareness on the initiative and, at the same time, spread the goals and the objective of GREENOMED Project among stakeholders. Alongside the presentation, brochures and informative materials have been distributed during the event. During Remake Festival, ACMM were able to reach 3 new SMEs.

ACMM also joined the final Greenomed conference, held in Milan on 5th December 2019, targeting Regional Authorities and policy makers from the MED area and other European regions. On this occasion, one representative from Marche Region joined the conference.

The event aimed at presenting the Greenomed inter-regional cooperation methodology, as well as the results of the testing of the methodology within the partner Regions. Thanks to the conference, challenges experienced by the stakeholders and possible support provided by the regional authorities have been shown. The conference, which has also provided a useful insight of the Vanguard Initiative and the connection with GREENOMED project activities, has been very beneficial for the representatives of the Regional authorities who joined the discussion, since they had the chance to share challenges and best practices related to the involvement in Vanguard initiative and to discuss a potential cooperation agenda for the future.

4.1.3. Identification of key topics for pilot plants

During the last reporting period, ACMM focussed on the consolidation of the topics identified in the previous periods:

- **De- and remanufacturing;**
- **Special and dangerous waste treatment and recycling.**

Both the topics are linked to green and sustainable manufacturing and its improvement and are aligned with the Smart Specialisation Strategy of Marche Region.

In particular, ACMM continued to stress the concept that the development of Pilot Plant represents a real opportunity for the Region, in order to create a more innovative and sustainable system, with benefits for the agents involved. Thanks to the Pilot Plant, considerable critical mass will be produced around the eco-sustainable field.

Considering, De-and remanufacturing, ACMM pushed on the involvement and animation of stakeholders within the working group, whose main goal is to understand how to recycle and re-use the production waste, including the waste of composite materials. At a regional level there is an increasing awareness around the topic and the regional authority has also launched a specific regional call concerning the importance of adopting eco-sustainable practices within the industrial ecosystem.

On the second topic identified, ACMM is still working together with the Università Politecnica delle Marche and ISTAO on the identification of sub-topics for the development of an additional working group on special and dangerous wastes

Finally it is important to remind that, during the project execution, ACMM identified also energy efficiency as a topic of potential interest; however, it was difficult to find a common ground of interest among the actors involved and, after some meetings, it was not possible to formalize the engagement of companies and so activities in this framework were stopped.

4.1.4. Establishment of Regional core groups

During this period, ACMM spent its effort in the orchestration of activities within the regional working group focused on the “*De and remanufacturing for composite materials*”, in order to better define the configuration of the working group and continue the collection of letters of intent from the Regional stakeholders interested in taking part in the establishment of the proposed core group.

Currently, 12 actors compose the working group, including 1 University, 1 Living Lab and 10 companies. These organisations were also mapped on the stakeholders mapping tool (D2.2.1) to have a constant track of the working group’s configuration.

ACMM also focussed on empowering the commitment of companies, which had already formalized their engagement through their attendance at dedicated meetings/workshop/events. Additional meetings were also organised in this RP. More details have been reported in the next section (4.1.6. *Consolidation of Regional Working groups*)

Regarding the topic of “*Special and dangerous waste treatments*”, ACMM is working with Università Politecnica delle Marche and ISTAO for the establishment of a second working group. A survey to map possible companies interested in this topic has been developed and distributed among potential stakeholders and for the next steps ACMM will analyse the collected data, in order to find a common value chain and get the working group started.

4.1.4.1. Companies involved in testing activities

Since the beginning of the project, ACMM established a regional working group composed by 12 actors (among which 10 are companies) that have signed the letter of intent.

4.1.5. Motivating ideas

During this period, ACMM continued to organise regional meetings, in order to stimulate the discussion within the actors involved in the working group on de/ re-manufacturing for composite materials.

As already reported, during the meetings, the cluster proposed to realize a first mapping of the composite materials, in order to have an exhaustive overview of the topic.

Thanks to this action, ACMM identified the most used technologies in the reuse of thermosetting composite materials, including mechanical grinding treatments and sieving,

pyrolysis, extraction with supercritical fluid, used as a solvent, incineration. In parallel automotive sector, nautical sector and wind sector were identified as the most important field of activities where these materials are applied.

Moreover, it emerged that the already existing technologies applied for the reuse of the composite materials are limited and expensive. In particular, the high cost of technologies does not allow companies to implement and integrate in their processes the reuse of composite materials. Furthermore, among the critical issues underlined there is the lack of specific legislative regulations on the topic, in order to provide companies useful guidelines and incentives to boost the reuse of composite materials. The creation of a Pilot Plant for the treatment of mineral fibres, plastic resins and other composite plastic materials could be a solution to the problem, since companies can have a demonstration infrastructure where to test and uptake technologies.

4.1.6. Consolidation of Regional Working groups

During this period, ACMM worked hard to keep on with the consolidation of the regional working group. Two working group meetings have been organised on the 26th November and 18th December. On this occasion companies had the opportunity to reinforce the cooperation and synergies with the already identified Living Lab, the laboratory on non-destructive checks for composite materials, by deeply understand which technologies are applied to realize such testing activities. Moreover, stakeholders had the opportunity to discuss ideas and proposals on the issues identified.

ACMM has also stressed the interregional dimension of the working group, facilitating exchanges and meetings with the stakeholders from other regions. In particular, a bilateral collaboration has been established with Lombardy partners AFIL and STIIMA-CNR and local stakeholders.

During this period, ACMM also attended the final Greenomed conference organized in Milan on the 5th December 2019, where ACMM had the possibility to transfer the main outcomes of the working group activities to regional authorities attending the event, in terms of identified innovation priorities, potential impact evaluated and actors mobilized. To complete the overview, ACMM also presented challenges experienced by stakeholders as well as potential support to be provided by the regional authorities.

As a result, the regional authorities recognized the importance of having stronger collaborations in place, interacting on specific EU project and aligning regional policies according to the priorities identified. It was also recognised the value added of Vanguard Initiative in offering a shared framework where to build and reinforce partnerships on the basis of regional S3 while involving companies and key stakeholders of the regional innovation ecosystems.

On this occasion, ACMM has also activated a fruitful cooperation with the Croatian Chamber of Commerce on the issue of plastic recovery from the sea.

4.2. Region of Central Macedonia

4.2.1. A general overview of the Region status quo & Smart specialisation strategy

During this reporting period the Region of Central Macedonia presented its actions on Bioeconomy at the 7th Regional Development Conference in Patras on October 9th, 2019. At the Sustainable Rural Development Summit, the role of regional/local administration in the new Common Agricultural Policy, which will manage a higher proportion of funding than previous periods, was discussed. In the "Sustainable Rural Development" session, the Head of the Department for Scientific Technical Support and Implementation of Programs of the Regional Development Fund of Central Macedonia, referred on Central Macedonia Region Bioeconomy. The Region has integrated "Circular economy as waste management" and "Biogas utilization" in its priority areas. "Industry and the circular industry are interconnected with the financial tools managed by the Region of Central Macedonia to support design at a practical level and to deliver effective results with direct and indirect benefit".

Furthermore, Region of Central Macedonia participated in "Strengthening RIS3 Governance and the Entrepreneurial Discovery Process" organized in Chios on November 28-29th, 2019 in collaboration with the Ministry of Economy and Development and the Region of the North Aegean. It aimed to support regional and national authorities in Greece in the design and implementation of regional research and innovation policies, by facilitating cross regional learning both within Greece and internationally. A primary objective of the workshop was to solicit views on an improved division of policy tasks for the design and implementation of RIS3 in the next programming period. Participants worked using a structured methodology developed by the JRC to identify governance architectures that could simplify and accelerate implementation.

Finally, the Region of Central Macedonia and especially Thessaloniki hosted several conferences-events around the circular economy among which the 7th Stakeholders meeting of BIOREGIO project, which was co-organized by the Regional Development Fund of Central Macedonia and the Laboratory of Heat Transfer and Environmental Engineering of the AUTH Department of Mechanical Engineering gathered regional actors active in the field of circular economics, in particular circular bio-economics.

4.2.2. Vanguard framework setting

i-BEC took special effort during this RP in order to raise awareness on Vanguard Initiative and to spread the opportunities raising in the Region of Central Macedonia thanks to the active participation in the Vanguard community. In particular, i-BEC promoted the basic principles of Vanguard framework in several regional events organized or co-organized by i-BEC in the frame of GREENOMED project. The first one took place on October 14th at i-BEC premises which was an informative-training course with representatives (policymakers) of the Region of Central Macedonia as well as of the Region of Western Macedonia, while on October 15th, i-BEC organized the 1st GREENOMED Transfer Event in the Region of Central Macedonia in order to inform and provide further support to the regional clusters



willing to follow the GREENOMED methodology in their organizations towards the transition to a greener operational model. Finally, the Scientific Director of i-BEC, Pr. Zalidis, accompanied by two representatives of the Region of Central Macedonia participated in the 3rd GREENOMED Conference which was held in Milan on December 5th, which was targeted to regional policymakers and it provided them more information on the procedure to become a formal member of the Vanguard association. As a result, Region of Central Macedonia stated that in the upcoming period with the support of i-BEC will launch the procedure required in order the Region of Central Macedonia to enrol and become an active member of Vanguard Community.

4.2.3. Identification of key topics for pilot plants

During the last Reporting Period of GREENOMED project, I-BEC continued its activities regarding the 3 key topics, described in the previous reports. Although activities dealing with topics' identification have been stopped in the end of the 4th RP, activities focusing on the empowerment of the 3 local working groups are still taking place in the Region of Central Macedonia in order to create a significant critical mass around the topics of interest for the region.

A brief summary of the identifying topics in which i-BEC is working-on is given in the following paragraphs.

✓ **Exploitation of wineries' biomass residuals to energy production**

The aim is the development and demonstration of an innovative, small-scale and modular power generation unit, which can utilize agricultural residues (primarily focusing on wineries' biomass residuals) for the combined heat and power production, on-site. The proposed pilot plant is based around a technology which was developed in cooperation with the Aristotle University of Thessaloniki, under the framework and co-financing of the EU LIFE+ SMART-CHP Project.

✓ **Exploitation of agro-energy industries' residuals and by-products to produce feed and food ingredients through microalgae cultivation**

The exploitation of agro-energy residuals and by-products (such as glycerol and liquid digestate) through a symbiotic operation framework of biodiesel – microalgae - biogas industries, will permit the conversation of the residuals of the production lines (crop and biogas residues, biodiesel and microalgae by-products) into new, high-added value pharmaceutical products and reclaimed resources which will further return to the production line. To that end, the current pilot aims to provide a holistic solution concerning the efficient management of the environmental loads derived from the operation of biogas and biodiesel plants.

✓ **Exploitation of ginning and spinning mills' solid waste to energy production**

This pilot plant will address the establishment of a sustainable procedure of burning cotton residues to produce electricity. Nowadays, in the market of biomass combustion plants, there are only plants that burn wood and agricultural waste, but there are no specially designed units for burning cotton residues.

4.2.4. Establishment of Regional core groups

During RP6, i-BEC continued its effort in the consolidation of the three regional core groups. An extended concept note for each one has been created and further discussions have been made in order to clarify technical issues of the joint venture in the framework of Greenomed. New stakeholders joined the working groups in addition to the ones already involved in the testing activities.

4.2.4.1. *Companies involved in testing activities*

Two additional letters of intent were collected during this RP, in total I-BEC has received 13 letters of intent from enterprises. In addition to these some other companies are involved in the activities of the working groups.

i-BEC will continue its activities after the end of the project with the ultimate goal to create a significant critical mass around the topics of interest for the region and proceed to the exploitation of the work done throughout the duration of the project in the Region of Central Macedonia.

4.2.5. Motivating ideas

During the 6RP, i-BEC organized with the support of STIIMA-CNR and AFIL a Bio-economy Working Session with representatives from the three regional Working Groups during which the main concept of each group was evaluated by all the participants in terms of Innovation relevance and potential impact for the regional industry and for the Mediterranean zone as well. A further discussion about the capability of the Region of Central Macedonia to promote and support the development of pilot plants also took place during the working session. GREENOMED partners stated that common ground with other Vanguard regions have been detected and that could act as moderators in order to establish some synergies with them in the near future. All the participants argued that the proposed pilot plants are innovative and capable to bring several economic and environmental benefits for the Region of Central Macedonia, however, the enrolment of the region to the Vanguard Initiative is catalytic for the transition of the regional working groups to the next phase which is the implementation of their business plans. Finally, some complementarities with other ongoing projects that are implementing in the Region of Central Macedonia were detected and i-BEC as the moderator-facilitator of the GREENOMED working groups in the Region of Central Macedonia is in contact with the project BIOREGIO ("Bio-based circular economy in European region" _Interreg Europe) in order to evaluate the possibility of the establishment of an open synergy with their community.

4.2.6. Consolidation of Regional Working groups

During the 6RP, i-BEC continued the activities towards the empowerment of the three local working groups that have been established during the previous periods. I-BEC succeeded in receiving the formal commitment of two additional companies during the 6RP, making all the local working groups effective forces, consisting of a critical mass of SMEs established in the Region of Central Macedonia. Thus, from now on, the three GREENOMED working groups of the Region of Central Macedonia are capable to represent interests of the region in front of authorities.

About the events held in this reporting period, on October 15th i-BEC organized a testing event dedicated to the SMEs participating in the regional working groups. The testing event was followed on the 16th October by a visit to the Lab of General & Inorganic Chemical Technology of School of Chemistry of Aristotle University of Thessaloniki (Nanomaterials and Chemical Processes Group) one of the cooperating lab of the GREEN Living lab. During the visit, representatives of regional SMEs had the opportunity to get informed about the activities of the lab linked with the analysis and exploitation of agro-based residuals.

In order to raise awareness on the regional authority, i-BEC organized a formal political meeting with the Representatives of the Region of Central Macedonia in order to present the results of the GREENOMED activities and ask further support from the Region of Central Macedonia to guarantee the continuity of working groups after the end of the project allowing them to proceed on the implementation of their business plans. Moreover, Dr Abas, alderman of the Region of Western Macedonia in the division of Rural Development, which participated in the informative-training course dedicated to policymakers held on 14th of October 2019, expressed its willingness to transfer the GREENOMED methodology to relevant stakeholders of its region since he believes that the tools and services produced through GREENOMED project are applicable and of great value for its region as well. Finally, i-BEC brought in contact the local GREENOMED working groups with clusters and business associations which although are not members of the core groups could interact with them and proceed to the establishment of new synergies in the frame of green manufacturing.

Concerning the internationalisation of the Working Groups, the Testing Event which were held on the 15th of October in i-BEC's premises give the opportunity to the regional stakeholders to get informed about the activities of the Lombardy Green Chemistry Cluster (Italy) as well as to establish some synergies with it, especially after the envisaged enrolment of the Region of Central Macedonia to the Vanguard Community.

4.1. Croatia

4.1.1. A general overview of the Region status quo & Smart specialisation strategy

Since no major changes occurred since the last reporting periods, a general overview of the regional policy framework and related strategies is hereby reported:

A number of major strategies have been adopted recently in Croatia and S3 tends to unify all the relevant aspects from the various sectorial strategies. Croatia is a small country 4, 17 million with a very open economy and this is a reason why the concept of smart specialization remains at the national level. The economy faces major challenges and through S3 Croatia is facing several major obstacles preventing its higher economic growth.

The innovation system is operating below its potential and it is significantly below EU innovation average. Further structural problem that Croatia faces is the volume of business R&D which is low.

Croatian export consists of high value products and services but HR skills and technological capabilities are in stagnation and this trend reflects on competitiveness rankings, export results and technological performance.

S3 strategy consists of 5 main thematic priority areas (TPA) and 13 sub-thematic priority areas (STPA):

- **Health and Quality of life**
Pharmaceuticals, biopharmaceuticals, medical equipment and devices
Health services and new methods
Nutrition
- **Energy and sustainable environment**
Energy technologies, system and equipment
Environment friendly technology, equipment and advanced materials
- **Transport and mobility**
Added value manufacturing of vehicles parts and systems
Environment friendly transport solutions
Intelligent transport systems
- **Security**
Cyber security
Defence dual use
Mine action program
- **Food and bio economy**
Sustainable food production and processing
Sustainable wood production and processing

Additionally, Croatia has identified two cross-cutting themes for creation of the biggest added value and rising of the productivity of Croatian economy. Cross-cutting themes are: Key Enabling Technology (KETs) and ICT.

4.1.2. Vanguard framework setting

During CIE continued the organisation of bilateral meetings with potential stakeholders with the aim to include them in the framework of GREENOMED activities and in Vanguard Efficient and Sustainable Manufacturing pilot. The Living Lab event organised by CIE in July and the Transfer Event held in November, contributed to further disseminate Vanguard Initiative and its project toward Croatian stakeholders.

CEE brought the attention of several events on the Vanguard Initiative. In particular, during the Transferring Event organised in Zagreb on November 19th, beside the transferring of GREENOMED methodology to other intermediaries (WP4), the meeting had the important task of enabling the harmonisation of regional entrepreneurial innovative projects development within Vanguard initiative in alignment with S3 Strategy.

In addition, CIE and CEE attended the GREENOMED Final Conference in Milan on December the 5th bringing to the table the representatives of the Croatian Ministry of Economy, Entrepreneurship and Crafts (ASP) as Croatian RIS3 responsible institution. During the event they were introduced to the Vanguard Initiative and the background of the Greenomed project as well as to the procedure for formalising the participation to the Vanguard ASBL as member Region. The meeting was also the occasion to present to regional authorities the expectations and challenges faced by stakeholders and project partners as well as possible support that respective decision makers can provide to business sectors.

4.1.3. Identification of key topics

As emphasized in the previous report, CIE identified **Energy Efficiency** as one of key topic to be developed by the working group. During this reporting period, they continued the identification of potential partners founding 4 new clusters interested in collaborations on GREENOMED topics.

Regarding CCE Varaždin, after the initial difficulties emerged with the “Automation and robotics” topic with no critical response from the businesses community. A top-down approach was applied and CCE decided to move toward **Circular Economy** in order to deliver new business opportunities to regional industry and eco-system. In particular, during this last period, the working group has focused on a specific use-case targeting the waste form toner cartridge. This case was elaborated in cooperation of Greenomed Living Lab and Zagorje Tehnobeton Ltd. as the member of the working group. In Croatia hazardous wastes from special categories make up a large share and in addition there is no such landfill or facility in the Republic of Croatia that could take over this waste. Waste toner powder as a

raw material in accordance with postulates of circular economy is poorly investigated with small number of published scientific papers. Therefore, the aim of research of waste toner powder was to determine the possibility and justification of using it as a raw material for innovative concrete products in accordance with the requirements of the circular economy, thus closing the recycling process. This research shows a realistic industrial sample and is created in the process of mechanical treatment of waste toner cartridges in plants of the national concessionaire for recycling electrical and electronic waste. Testing of the usability of the obtained concrete products was carried out at laboratory and industrial level, Laboratory of Environmental Engineering at the Faculty of Geotechnical Engineering and at the construction company.

4.1.4. Establishment of regional core group

In order to extend the regional Working Group, CIE organized bilateral meetings with companies which are recognized as potential for collaboration. 4 of them were interested and signed letters of intent and they also expressed the willingness of developing some joint activities.

CCE faced difficulties in mobilizing regional stakeholders and in the creation of critical mass of companies interested to cooperate in selected topic, due to the lack of well-structured innovation eco-system as well as lack of linkages between research institutions and business sector. In general, at the company level, CCE detected organizational problems, lack of technological expertise and lack of skilled workers as well as shortage of financial means. Although it was difficult to formally engage companies in the activities, networking actions carried out during this project for sure gain further opportunities and build long term relationships with wide base of stakeholders.

At the same time, we tried to involve in the project the R&D teams, mainly from the universities. Since R&D system in Croatia is defragmented, we expected further problems, but it turned out that academic community is very active and that there are capacities and demand in suggested topic – circular economy.

4.1.5. Motivating ideas

In order to motivate ideas within the regional working group, CIE discussed with members of WG about opportunities for development of efficient and sustainable manufacturing in Croatia. As stated in the last report, Living Lab events were used to achieve this scope and the same was done during this reporting period exploiting the Transfer Event to motivate the relevance of the topic identified for the regional economy. State utility has recognized the topic of “energy efficiency” as very important and therefore will participate in IRI2 project with CIE’s stakeholders. The state utility has 21 distribution sectors in the region.

Concerning CCE, for the activities of the core working group it emerged that the shift from linear towards circular economy in Croatia must accelerate. CCE recognized the possibility of dealing with problem of circular economy in cooperation with the Faculty of Geotechnical Engineering, one of the leading research institutions in environmental engineering, by establishing Living Lab. This would be a place where theoretical knowledge, scientific research and practical experience in the field of interdisciplinary technical sciences could be

provided by staff of the Faculty that would help the economy, especially the economic subjects in Varaždin County. In frame of this cooperation the research of the use of the waste toner cartridge is elaborated as use case and confirmed effective cooperation of Greenomed Living Lab and company Zagorje Tehnobeton Ltd. as the member of the working group. Given that the field of research is very narrow and specific, there is no significant scientific work or implementation examples to date. The results of this research are of interest to both waste management companies and the treatment of waste toner cartridges, as well as to the construction industry with the aim of reducing environmental impact by replacing some of the original raw materials in concrete production.

4.1.6. Consolidation of Regional Working groups

At regional level, CIE organized the 2nd Living lab event in Zagreb, where participants had the opportunity to visit FER LARES – Living lab of the Faculty of Electrical Engineering and Computing in Zagreb. One of the participants was a representative of the National Research Council (CNR ITALY), Mrs. Golboo Pourabdollahian who expressed a strong interest in FER LARES's work and proposed a possibility for future cooperation involving stakeholders of the respective regional Working Groups.

Another interesting occasion for the consolidation of the existing group was the Transferring Event organised in Zagreb in November. Indeed, a member of CIE's working group manifested its interest toward a new INTERREG project presented by CEE, namely S3HUBinCE.

Finally, in order to foster internalization of working groups and exchange of knowledge and ideas, CIE invited (CCC FPS & EUVITA Cluster) to attend the Greenomed inter-regional Food Manufacturing in Milan. Although the representative was prevented from participating due to other obligations, CIE will evaluate the relevance of the involvement in this "Food Manufacturing" working group.

For CCE, networking activities were strategic to increase awareness on news and trends, find out about new business opportunities and constantly widen circles of potential partners is the key element of success, especially in Greenomed, as a project of testing of the new methodology. Focusing on the new topic identified, a seminar "Boosting the circular economy" organized in the CCE Varaždin on 26th-27th September 2019 was an additional trigger to participants to join the stakeholders working group Circular economy. Based on this feedback the CCE Varaždin contacted for additional support the Department of the Environmental technologies of the Geotechnical Faculty in Varaždin as the regional key player and experts in this field.

Focusing on entrepreneurs' identified needs during the communication with the members of the working group, CCE has also organized the conference Smart solution for Growth and Jobs on 13th June 2019 with 26 participants to encourage entrepreneurs in using national incentives and EU grants, as well as in exploiting the opportunity offered by GREENOMED project to integrate into the European value chain networks through infrastructure investment and capacity building, technology transfer, R&D in order to improve existing and create new products and services, within the sectors related to the priorities of the Croatian Smart Specialization Strategy.

4.2. Slovenia

4.2.1. A general overview of the Region status quo & Smart specialisation strategy

As already indicated in the previous report, Slovenia introduced in its Smart specialisation strategy Strategic Research and Innovation Partnerships. S4 in Slovenia is somewhat specific as it is a combination of top down and bottom up approach. Namely in the preparation of S4 which was prepared through EDP SRIPs were envisioned (Strategic Research and Innovation Partnership). These SRIPs were envisioned in order to better define specific areas of priority. One SRIP (e.g. almost megacluster) was selected through a public call for each priority and their first task was to develop action plans. All of the action plans were confirmed and are monitored by a working group of state secretaries. SRIPs function as integrators of sector.

Slovenia has entered the Vanguard initiative in 2017, thus the regional working groups and activities are only starting to form. The Strategic research and innovation partnerships mostly linked to green manufacturing and pilot plants.

4.2.2. Vanguard framework setting

Since the beginning of GREENOMED project, Slovenian partners (TPLJ and PTP) have actively communicated Vanguard Initiative to interested and concerned Slovenian stakeholders. The list of identified and contacted stakeholders has been constantly updated on the stakeholders mapping tool (D2.2.1). Moreover, also in this reporting period several meetings have been organised to further spread Vanguard Initiative information and updates to the regional stakeholders.

- TPLJ actively participated in a virtual meeting organised on September, 13th 2019 by “ESM – Efficient and Sustainable Manufacturing” pilot focusing on “Energy-flexible and resource-efficient factory operation (EFREFO)” demo-case. TPLJ presented a potential use-case and established connections with relevant international stakeholders.
- In October 2019, TPLJ organized an event called “*The Vanguard Initiative and Pilot ESM Efficient and Sustainable Manufacturing*” at the Jozef Stefan Institute as part of the Transferring event to Clusters where the Vanguard Initiative and its pilots, demo-cases and use-cases were introduced to relevant Slovenian Clusters. One-to-one meetings with relevant SRIPs and most active organizations in the Vanguard Initiative, SRIP SMART CITIES AND COMMUNITIES, SRIP CIRCULAR ECONOMY, SRIP FACTORIES OF THE FUTURE were held in parallel to this event.
- On November, 19th 2019 a formal Transfer actions toward policymakers took place at the Government office for development and European cohesion policy. Also in this case there was the opportunity to discuss the role of the Vanguard Initiative for the Region and the expected benefit from the involvement and participation to ESM Pilot.

4.2.3. Identification of key topics for pilot plants

For TPLj the phase of identification of key topics started in RP3 with the review of SRIP action plans followed by several meetings (bi-lateral in some cases) focused on the identification of key priority topics with the contribution of key regional stakeholders. The result was the identification of 3 topics: *Magnets, Remanufacturing of glass fibers for construction purposes, Remanufacturing of materials*. However, due to various obstacles (IPR, motivation NDA) during RP4 the focus has been moved toward *Industry 4.0, Photonics and Plasma for industry*.

In order to speed the development of the targeted topics, during RP5 TPLj and its stakeholders decided to narrow the focus to obtain better results. This action was supported by an external consultant and continued during RP6 following a methodological approach. Indeed, the identification of key topics was carried out in several phases. The first phase led to the pre-identification of key capabilities but also challenges and opportunities to be tackled in that context. As a result of the desk research, preliminary contacts and pre-scoping workshop sessions, a clear vision for Slovenia's approach to ESM was elaborated. The pre-scoping effort led also to the consultation of stakeholders and the identification of possible matching between the Slovenian ecosystem and existing ESM demo cases. It also led to the identification of potential new demo cases as well as to the identification of use cases that could be further developed as seen in the figure below:



Another phase followed during which representatives of key organisations were requested to identify pre-proposals for business cases. The following figures illustrates the type of pre-proposal put forward by the intermediary organisations.

Name of the possible cross-regional innovation project	1. Topic/subject (TRL6+ only, with a commercialization perspective) and objective(s)	2. Key activities of such cross-regional innovation project	3. Who in Slovenia (companies/RTOs) could be included in innovation project	4. Missing competences (capabilities not available in Slovenia) that would justify a cross-regional setting
Advanced monitoring system for production processes	Development of monitoring system in accordance with Industry 4.0 requirements for tooling sector	Main key activities will be: - Development of hardware (Wireless communication module, acquisition module, power supply module, memory module, ...) - Development of software (Signal filtering, signal processing, analytics, coding of AI algorithms, ...), - VR working places, - Integration of hardware and software, - Testing in real production environment	TECOS - Slovenian tool and die centre Kolektor Toolshop, Gorenje Toolshop, Hidria, ...	Missing competences: - VR, - Digital workplace, - AI algorithms, - Data analytics

Finally, TPLj came up with the definition of two business cases: **Resyntex** and **Twin**.

1. **Resyntex** consists in the deployment of **depolymerisation techniques to re-use sportswear polyester in the production process**. It is based on secondary raw material inclusion in the production process (no virgin material) and non-wearable textile waste (wool-cotton-polyester textile waste blends) as a valuable source for new chemical feedstock. The research carried out at RESYNTEx pilot plant and in the related H2020 project highlighted that several tested processes could offer feasible business opportunities when scaling-up the production. At the moment the capacity of RESYNTEx pilot plant is 100 tons feedstock per year. The facility can be used for several type of textile industry residues and chemical processing but in this scoping note the focus is on polyester production from waste. The pilot plant itself can serve as platform for further testing of textile waste. The polyester driven processing was chosen as key domain because of the high recovery rate and good availability of feedstock when thinking of scaling up the processing volume. For instance, global sportswear market is excellent an opportunity.
2. The **TWIN** Project will focus on the cross-regional demonstration of digital twins to enable flexible robotic cells in plastic injection moulding value chains across automotive and white goods sectors. By digitising all aspects of current production processes, it would be possible to compute the most optimal and efficient ways of working and implement them in practice but also optimise them.

Focusing on PTP, during RP6 they decided to shift the focus toward “Food manufacturing” and “Bioeconomy” having identified strategic stakeholders that can guide the development of use-cases in these domains which are of interest for the companies of this region.

In particular, in July 2019, PTP organised a meeting with the Jozef Stefan Institute and the expert firm Campden BRI to discuss about concrete applications in the domain of Food Manufacturing. Moreover, thanks to the support of the external expert LEA, a use case in Bioeconomy area was identified dealing with Algae Bio Gas treatment. Algen Technology Center from Slovenia together with KO-TO Ltd has tested the targeted technology in real business environment and they have also developed a demo-plant.

4.2.4. Establishment of Regional core groups

In total 50 companies were identified or contacted by TPLj. Some of them were recognised as Working Groups potential participants, but due to the change of topics in WGs, some of



them are currently not active. During this RP, three additional companies were involved by TPLj.

In the company's identification process, TPLJ has followed the Greenomed methodology and aligned stakeholders accordingly. Through GREENOMED tools, we have conducted a systematic mapping of Slovenian stakeholders and possible interested partners.

For what concern PTP, besides the intensification of the relationship with IOS and SRIP CE, no additional letters of intent were collected. During RP6, actions were focused on the kick-off of Food manufacturing and Bioeconomy working groups, involving respectively SRIP Food and ALGEN. Moreover, thanks to the Transferring event (WP4), PTP has identified ITC cluster as future reliable partner for food related initiatives, especially focusing on the combination with digital technologies. On November, 8th PTP organised a meeting with an institute focusing on food industry solutions as well as future food developments like meat replacements, 3d printing of foods (partly based on another field they work on – medicine-tissue growth in special incubators). Additional key stakeholders will be involved in this core group, such as Faculty of Electrotechnics in Ljubljana due to identified focus in sensors that could assist Food manufacturers at high temperatures and pressure as well as at refrigeration and at freezing processes of food products.

4.2.4.1. Companies involved in testing activities

No additional Letters of intent have been collected during this RP. Until now, TPLj collected 3 Letters of intent.

4.2.5. Motivating ideas

As mentioned before, TPLJ with the support of the external expert, has also carried out desk research that implied a detailed review of all critical documents available (Fidea report, S4, Deloitte report, RCA report, SRIP evaluations, SRIP description notes, etc.). This activity was instrumental in scoping the exercise as it revealed key characteristics of the region (position in industrial given value chains, export profiling, technological capabilities, etc.). The team established contacts with key relevant representative(s) from the Vanguard Initiative to exchange baseline information and get an update on current trends and challenges currently facing the Pilot. While information from Vanguard Contact points can be accessed in an efficient way, profiling the regional capabilities in practice required interactions with regional contact points. Interviews were therefore organised with regional experts in the areas of: *Advanced materials, Circular economy, Digital manufacturing, Robotics, Government, Innovative entrepreneurship*.

Regarding PTP, thanks to the latest activities, it emerged that there is quite some potential in Slovenia in the fields of Food Manufacturing and Bioeconomy.

4.2.6. Consolidation of Regional Working groups

In the 6th RP, TPLj continued participated and hosted several events and meetings in this in order to further consolidate the regional WGs and orchestrate their activities.

On July 15th 2019, TPLJ held a bilateral meeting with Pomurje Technology Park (PTP) in order to align and synchronize the activities for the Slovenia region in an effort to join forces and better capitalize project results.

On October 3rd 2019, a working group session was hosted at the premises of Josef Stefan Institute. This session led to the design of two business cases which materialised into scoping notes.

At the end of the project, on December 5th 2019, TPLJ participated to the Final Project Conference organised in Milan at the Lombardy Region premises. During the meeting TPLJ presented the results of testing activities targeting Regional Authorities and policy makers from MED and other European regions. In particular, a detailed discussion on the achievements of testing activities and the benefit for their stakeholder, was held. In this context, TPLJ presented the 2 business cases elaborated focusing on potential future collaboration among regions as well as difficulties encountered during the project and recommendations for policy makers.

PTP, due to the change of topics, focused its action on the creation of new working groups rather than their consolidation. As reported in the section “Establishment of the core groups”, key stakeholders able and interested to guide a regional working group have been identified in both the areas. Moreover, PTP attended the first interregional meeting on Food Manufacturing, held in Milan of the 25th November 2019 to establish strategic collaboration with partners outside the region and evaluate the possibility of launching a new demo-case within ESM pilot focused on Food Manufacturing.

4.3. Auvergne Rhone-Alpes

4.3.1. A general overview of the Region status quo & Smart specialisation strategy

Auvergne Rhone Alpes Region is constantly interacting with its stakeholders for the updates of its Smart Specialisation strategy in line with the European trends and challenges. On September 10th 2019, the Auvergne-Rhône-Alpes Region organised a technical day focused on its strategy within Europe, in which green manufacturing/Factory of the Future takes place. This meeting gathered all regional stakeholders to set up priorities concerning its European strategy. On September 23rd, a National Contact Point meeting related to plastics took place in Lyon, to discuss about all future European programs about plastics, also corresponding to smart plastics. On October 18th, the Auvergne-Rhône-Alpes Region organised a meeting related to Digital Innovation Hub which have been implemented by regional clusters, Plastipolis presented its Smart Plastics DIH.

4.3.2. Vanguard framework setting

Auvergne Rhone Alpes Region is involved in Vanguard Initiative since years, but Plastipolis continued its actions toward diverse regional stakeholders with the aim to raise awareness on the benefits and challenges of the initiative and its pilot project.

In particular, on November 27th Plastipolis attended the demo-case meeting in Cerdanyola organised by EURECAT, as co-coordinator of the “Polymers based Functional products”. During the meeting a visit to the Catalan demonstrator was organised with the aim to showcase the technologies and competences available in the nodes and potentially useful also for stakeholders in other Regions.

In addition, Plastipolis joined the interregional meeting on “Secure and Sustainable Food Manufacturing” organised in Milan on November 25th, to discuss with other partner the idea of launching a new demo-case on “Food Manufacturing” under the ESM Pilot.

On December 5th, Plastipolis attended the Final GREENOMED Conference in Milan, which was mainly dedicated to transfer to regional public authorities project results as well as opportunities coming from the Vanguard Initiative network. Later, on December 13th, Plastipolis also attended the Vanguard ESM Plenary meeting, organised in Brussels to present the results of the 2019 and discuss the plan for 2020, in view of the collaboration with the different DG of the EU Commission.

4.3.3. Identification of key topics for pilot plants

As stated in the previous reports, since the beginning of the project Plastipolis has identified “Smart Plastics” as key topic for the development of pilot plant projects. Accordingly, activities were mainly focused on the consolidation of the contents related to this theme, which is fully aligned with the regional RIS3 strategies and the regional stakeholders priorities and it is coherent with the framework of GREENOMED activities.

Therefore, Plastipolis is continuing the orchestration of the regional stakeholders (i.e. companies, universities and public authorities) around the pilot plant projects on “Smart Plastics”.

In addition, following the interregional meeting of Food Manufacturing, Plastipolis is evaluating the interest and the relevance of this topics among the regional stakeholders to eventually create and animate a working group.

4.3.4. Establishment of Regional core groups

The core group working on “Smart Plastics” has been defined and it is active since the beginning of GREENOMED testing activities. During every RP, Plastipolis has worked hard in the identification and inclusion of new relevant stakeholders thanks to the organisation of events, workshops and bilateral meetings.

4.3.4.1. Companies involved in testing activities

At the end of the 6th period, no additional organisations were formally engaged. 4 letters of intent were collected from the WG members and signed.

4.3.5. Motivating ideas

Considering the progresses of the group in the previous periods, no relevant points were added to the arguments already outlined to demonstrate the relevance of the targeted topic. Due to the alignment of smart plastics activities with the regional specialization strategy and ongoing projects in the region, companies participating in the core group are aware of the strategic advantage which can benefit from structured pilot plant. As the companies in the core group collaborate with the living lab to make students work on dedicated projects, these companies are motivated to consolidate the pilot plant development. The Smart Plastics industrial club, organised 2 or 3 times a year, is the ideal meeting to motivate new ideas regarding the pilot plant and each meeting are relevant to discuss about potential improvement. Furthermore, the recruitment of the consulting company, LIP, will help to go deeper in the reflection of needs and barriers of the regional industry of smart plastics.

4.3.6. Consolidation of Regional Working groups

On September 17th, Plastipolis organised a techday on the topic of Smart Plastics in Lyon. It gathered about 50 people with presentations of technology providers and markets players in sectors such as automotive, aeronautics, sports and leisure, home appliances and health. This meeting was the opportunity to expand Plastipolis regional working group because other players were invited to attend and present what they can offer in the field of smart plastics.

Then, on October 14th Plastipolis organised the Smart Plastic Industrial Club, a meeting for the regional working group aimed at finalising the regional smart plastics analysis in order



to prepare its business plan. Thanks to this event, one additional company, Plastiform, joined the regional working group.

Finally, to speed up the elaboration of the business plan, a consulting company has been contracted for interacting with companies which have been identified in the regional mapping to engage them in the writing of the final note and the business plan.

5. Implementing the methodology beyond GREENOMED

As outlined in the periodic reports, testing activities allowed GREENOMED partner to implement and validate the steps of the cooperation methodology defined within the project. Although not all the partners completed the steps envisaged during the project lifetime, implementation of targeted actions and orchestration of the WGs will continue beyond GREENOMED and cooperation among partners will continue too.

Accordingly, testing partners have expressed their plan for the upcoming months that will continue leveraging on the methods and tools proposed by GREENOMED coaching partners and include the positioning within Vanguard Initiative networks.

5.1. Marche

After the end of GREENOMED project, ACMM has planned to continue the actions initiated following the steps proposed by the methodology developed.

For what concerns the interactions with the regional administration, ACMM will keep on improving the cooperation with Marche Region with the aim to achieve their involvement from in the Vanguard Initiative. Thanks to the participation to the final project's conference in Milan it was possible to strengthen the potential benefits that the initiative can bring to the Region, such as a coordinated and structured methodology and encourage the dialogue between the political/institutional and industrial plan.

Considering the capitalisation of interregional collaboration established thanks to GREENOMED, ACMM will reinforce the cooperation with AFIL, focusing in particular on the topic of De and re-manufacturing and involving the stakeholders of the two working groups in order to reinforce synergies among companies of the two territories. In particular, ACMM is planning to organize a matchmaking event with the AFIL working group in order to find common solutions on the issue of reuse and recycling of composite materials. The event will be also the opportunity to present best practices useful for companies facing similar problems.

Finally, further synergies will be explored with the Croatian Chamber of Commerce on the issue of plastic recovery from the sea. Applying the same steps that led to the creation of De-and Remanufacturing working group, local stakeholders will be activated also on this topic such as Engineering faculties of the University of Ancona.

5.2. Region of Central Macedonia

i-BEC with the support of the Region of Central Macedonia will continue to animate the 3 Workings Groups which have been created through the GREENOMED project. Towards this direction a formal meeting will be organized the upcoming period in the Region of Central Macedonia. The goal of this meeting will be the orchestration of the next steps of the regional working groups with the support of the Region of Central Macedonia in order to proceed in the phase of pilot plants. Participants of this encounter will be representatives from each one of the working groups will participate, the Scientific Director of i-BEC as well as representatives from the Region of Central Macedonia. In the core of the discussion will be



the evaluation of different financial mechanisms provided by the Region as well as the opportunities raising by the enrolment of the Region of Central Macedonia to the Vanguard Community. The Region of Central Macedonia has already stated that will launch the procedure to become a member of Vanguard Initiative, thus this appointment will be of great value for the regional working groups in order to get informed about the steps that will have been taken from the Region towards this directions. Moreover, i-BEC will continue to act as a mediator between the regional working groups and GREENOMED- Interreg MED community in order to ensure the further internationalisation of the Working Groups as well as the implementation of pilot plant(s) in the near future in the Region of Central Macedonia based on the work done through GREENOMED project. Finally, towards the internalization of the regional working groups i-BEC will continue its contacts with the Lombardy Green Chemistry Cluster (Italy) in order to proceed in the submission of a common business plant in the field of microalgae cultivation to the Vanguard Initiative.

5.3. Croatia

Considering the collaboration with the industrial stakeholders engaged in CIE Working Group, bilateral meetings with two WG members, to the decision of going forward with collaboration on the IRI2 project, which is seen as an extension of Greenomed methodology focusing on the topic of energy efficiency. More in details, the project is aiming at the development of systems for optimization of technical and non-technical losses in microgrids based on the combination of modular hardware for activation of network state using IIOT and advanced analytical algorithm for estimation of technical and non-technical losses in advanced network. The projects worth combined is 17 million euros, and it will generate 5 new work places within the WG.

On regional authority side, the ministry of Croatia is thoroughly informed about the benefits being a Vanguard Initiative member and it is now aware of the process required for the formalisation of the Regions engagement in the initiative.

Building on the successful results of GREENOMED project, CCE will exploit its advantageous position built during the project lifetime to further enhance regional “green” manufacturing development and innovative transformation of the regional industries.

Indeed, CCE Varaždin is implementing a new project aimed at establishing DIH and one of the working groups of this project is dealing with innovation in a Circular Economy. Moreover, CCE will keep on building these strong corporations within ecosystem to establish appropriate institutional framework using best practices showcased by our mentors, experienced partners from other regions. We will try to continue to build these ties within ecosystem in frame of this project and our goal is to establish appropriate institutional framework using best practices of our mentors, experienced partners from other regions.

5.4. Slovenia

Although the Greenomed project successfully finished in December 2019, TPLj will continue working on the 2 cases: Twin and Resyntex in the future. In January 2020 a meeting is planned with the Slovenian Government office for cohesion and development to present the

final results. Testing results will also be shared with the Slovenian Ministry of Education, Science and Sport and Ministry of Economic Development and Technology who are, together with Government office for cohesion and development, the three entities who are responsible for the Slovenian membership in the Vanguard initiative. Project results will also be shared with SBRA – Slovenian research and business association – who are a Brussels – based association appointed by the Slovenian Ministry of Economic Development and Technology and represent Slovenia in the Vanguard board.

The key stakeholders for both cases will continue working on their cases. For example, with the Twin case we have foreseen these activities according to the following time-plan:

1) 2019-2020

- a. December-February: Finalisation of the new version of the scoping note and finalisation of the initial on-boarding process
- b. December-February: awareness raising and match-making through public entities and Vanguard intermediaries

2) 2020:

- a. Business case operations: development of the first operational plan (early 2020)
- b. European and Vanguard Initiative on-boarding through Greenomed and the ESM Pilot (early 2020)
- c. Procedure and legal coverage – including NDA (early-mid- 2020)
- d. Go-to-public sector (mid-2020)
- e. Business plan development including funding and financing mix (mid-2020)
- f. Access to funding and financing (end 2020)

Technology park Ljubljana has also signed the Interreg MED Green Growth Community Memorandum of Understanding alongside several Interreg MED projects where we declared to be engaged in the future to continue the action of promotion and implementation of sustainability/circular economy actions.

Besides that, Technology park Ljubljana will remain the local national contact point for stakeholders interested in joining the Vanguard initiative. Our work with the regional SRIPs – Strategic research and innovation partnerships has resulted in the awareness that TPLJ has valuable information and access to possible contacts for the work to be continued in an international setting. Moreover, TPLJ has cultivated valuable connections between partners of the Greenomed project and will continue to nurture these relationships in the future.

For what concern PTP, beside the difficulties experienced at the beginning of the project, it was able to meet the needs of the stakeholders involved working on a constant re-focus of the topics of interest. This led inevitably to delay in the activities implementation but at the end of the project PTP succeeded in establishing string relationships with key actors that can continue beyond the project lifetime. In particular, thanks to the methodology, the tools



and the services explored in GREENOMED, PTP will be able to continue the communication toward Vanguard Initiative and the involvement of key regional stakeholders.

PTP has also identified another good practice from Slovenia, a MED project called PANORAMED dealing with the topics of energy efficiency or production with /from algae. This represent a synergic action with whom to establish a collaboration in the upcoming months.

5.5. Auvergne Rhone-Alpes

After the end of Greenomed project, Plastipolis will continue to animate the regional working group in line with Plastipolis strategy. More in concrete, to ensure the continuation of GREENOMED activities, Plastipolis will capitalise the opportunities coming from the declaration as Smart Plastics DIH on European level.

In the framework of Vanguard, Plastipolis participates in a project leading by Eurecat in Catalonia regarding advanced sustainable surface and material technologies for functional polymer components. The other one region participating in the project is Lombardia in Italy.

Plastipolis is also part of INNOSUP proposal regarding the following topic: fostering the creation of circular, smart and inclusive value chains led by innovative SMEs leveraging on RIS3. Plastipolis is also leading another INNOSUP proposal regarding Green Smart Products: Support an holistic approach on environmental friendly smart products, from eco-conception to recycling, through sustainable manufacturing.

Plastipolis also took part of the submission of DT-FOF-09-2020 project on energy efficiency in smart manufacturing. the project is lead by Polimi and was submitted in February 2020.