

# Interreg



EUROPEAN UNION

# North-West Europe

# BioBase4SME

European Regional Development Fund



**Thematic priority: innovation**

Report on project strategy and impact

Report prepared by Bio Base Europe Pilot Plant (BE)

Supported by  
partners

CLIB - Cluster Industrielle Biotechnologie e.V. (DE)

Flanders Biobased Valley (BE)

REWIND Projecten BV (NL)

Materia Nova (BE)

NNFCC (UK)

tcbb RESOURCE (IE)

Association des Chambres d'Agriculture de l'Arc Atlantique (FR)

Nov&atech - CRAN (FR)

Biovale, University of York (UK)

Version

August 2019

## Contents

What is a bio - economy? Setting the scene.....	4
What and who is behind BioBase4SME? .....	5
1. BioBase4SME – Introduction to the project strategy and impact .....	6
1.1. Increased biobased innovation capacity in Ireland .....	6
1.2. Realisation of Innovation Biocamps for early stage entrepreneurs .....	7
1.3. Successful implementation Innovation Coupon Scheme .....	7
1.4. Key outcomes towards project objectives .....	7
1.5. Additional key outcomes.....	8
1.6. Key documents released.....	9
1.7. Key communication and dissemination channels towards general public.....	9
2. BioBase4SME Innovation support for Irelands bio – economy.....	10
2.1. Motivation for enhancing the innovation capacity.....	10
2.2. Pre-pilot line service offer.....	10
2.3. Ireland’s bio - economy long term stakeholder network.....	11
2.4. Success stories.....	12
3. BioBase4SME Innovation Biocamps.....	13
3.1. Strategy behind.....	13
3.2. Promotion and Implementation .....	14
3.3. Follow up on business coaching.....	15
3.4. Quotes from the participants of Biocamp 2017 and 2018 .....	15
4. BioBase4SME innovation coupon scheme.....	16
4.1. Coupon scheme strategy .....	16
4.2. Implementation of the coupon scheme.....	16
4.3. Impact of the coupon scheme – First outcomes August 2019 .....	17
4.4. Success stories of the BioBase4SME innovation coupon scheme .....	18
4.4.1. Plantics.....	18
4.4.2. Chrysalix.....	19
4.4.3. Ashleigh Environmental .....	19
4.4.4. OxfordBiotrans.....	19
4.4.5. Plaxica .....	20

## What is a bio - economy? Setting the scene.

The European bio - economy includes those areas of economy that use renewable biological resources produced on land and sea (e.g. crops, forests, fishing, livestock or microorganisms) to produce food, materials, chemical compounds and energy. With a turnover of €2.3 trillion, accounting for 8.2% of the EU's workforce, the bio - economy is a central element to the functioning and success of the EU economy.<sup>1</sup> A thriving bio - economy provides many advantages to the EU within the global economy. It decreases the dependence of producing countries on fossil resources (which are limited and pollutant), it uses local raw materials, it decreases greenhouse gas emissions and it promotes job creation, economic growth and the reindustrialisation of the EU. Europe is well positioned to develop and diversify its bio - economy, but for this it is necessary to establish new types of industrial collaborations and connections among different sectors, such as the agri-food, biotechnology, environmental and chemical sectors. And this is not so self-evident.

Although the advantages of a bio - economy are clear, there are many barriers to the successful transition from a fossil-based to a bio - economy. While large companies are often very successful at understanding the barriers to their business and typically have channels to influence policy, small and medium-sized enterprises (SMEs) have fewer resources and are less well represented. However, SMEs are the backbone of Europe's economy. The European Commission considers SMEs and entrepreneurship as key to ensuring economic growth, innovation, job creation, and social integration in the EU.<sup>2</sup>

---

<sup>1</sup> European Commission (2018) *A sustainable Bioeconomy for Europe: Strengthening the connection between economy, society and the environment*. COM/2018/673 final, doi:10.2777/792130  
[https://ec.europa.eu/research/bioeconomy/pdf/ec\\_bioeconomy\\_strategy\\_2018.pdf](https://ec.europa.eu/research/bioeconomy/pdf/ec_bioeconomy_strategy_2018.pdf)

<sup>2</sup> European Commission (2019) *Entrepreneurship and Small and medium-sized enterprises (SMEs)*.  
[https://ec.europa.eu/growth/smes\\_en](https://ec.europa.eu/growth/smes_en)

## What and who is behind BioBase4SME?

The Interreg NWE project [BioBase4SME](#) aimed especially at supporting these SMEs from across North-West Europe with their bio-innovations and advised them on how to overcome technological and non-technological barriers to develop their new ideas into marketable products and bring their innovations to the market.

The project offered free workshops and professional training, Innovation Biocamps and innovation coupons. The support offered through the innovation coupons included technical services such as scale-up to pilot/demo scale, application testing or support with anaerobic digestion and pyrolysis, or non-technical services such as Life Cycle Assessment, techno-economic evaluation, market research, feedstock analysis, social acceptance, business planning and business plan support, or a combination thereof.

BioBase4SME was funded by InterregNWE (project number NWE142) and ran for 3.5 year (Feb '16 – August '19) with a total budget of 5.8 M € and 9 consortium partners.

Co-financing partners included Bio Base Europe Pilot Plant (BE), NNFCC (UK), CLIB - Cluster Industrielle Biotechnologie (DE), Flanders Biobased Valley (BE), Materia Nova (BE), tcbb RESOURCE (IE), AC3A Association des Chambres d'Agriculture de l'Arc Atlantique (FR) and the University of York (UK), as well as regional supporters Wallonia (BE), Flanders (BE), Zeeland (NL) and North Brabant (NL) and research institutes Ryan Institute at NUI Galway (IE) and the University of Limerick (IE).<sup>3</sup>

---

<sup>3</sup> Read more about BioBase4SME on the project website <http://www.nweurope.eu/BioBase4SME>

## 1. BioBase4SME – Introduction to the project strategy and impact

The focus of BioBase4SME is on the emerging bio - economy. This economy is very multi - sectoral, as it affects at least 19 traditional sectors. This multidisciplinary makes it a hotbed for innovation, but at the same time raises difficulties in bringing innovations to the market, as the production process, the value chains and often even the products were at project start non-existing. The BioBase4SME network, representing many leading bio - economy experts, advised SMEs from across North-West Europe on how to develop new ideas into marketable products. The BioBase4SME project focussed on start-ups and SMEs to overcome technological and non-technological barriers to bring their innovation to the market. BioBase4SME enabled knowledge flows between professional support services and entrepreneurs from NW Europe that lead to a strong, interregional network in the last three years. The BioBase4SME network supported entrepreneurs towards successful innovation, and it improved the regional policy for the bio – economy in terms of innovation and investment climate, legal framework and public approval. In this report the project strategy and the evaluation of the project activities as well as its impact towards the objectives of the project are demonstrated.

### 1.1. Increased biobased innovation capacity in Ireland

In the beginning of the project NL, BE, DE, the UK and FR were regarded as the innovation drivers in the NWE territory, whereas Ireland was regarded as an innovation follower due to huge cuts in government spending after the economic crisis, which affected all industries including the bio - economy. Although Ireland had to deal with impeded circumstances to develop a bio - economy, it has an enormous potential for sustainable growth, especially in the agri-food sector as can be seen from the high ranking on the Innovation Scoreboard<sup>4</sup>. This was one of the reasons why Ireland was considered a bio - economy follower region in the BioBase4SME project.

Therefore, another aspect that was successfully dealt within the project was to decrease the disparity between the biobased innovation capacity in Ireland compared to the rest of NWE. The BioBase4SME investment in the pre-pilot facility in the course of the project offered facilities for innovators to start the development process (from TRL3/4 up to TRL5/6), and as such was continuously increasing the impact of Irish innovation. New knowledge and technology to source low-cost feedstocks from bio-wastes that improved the economic prospects for SMEs to make contributions to the bio - economy could be gained and is further explained in chapter 2 BioBase4SME Innovation support for Irelands bio – economy.

---

<sup>4</sup> European Commission (2018) *European Innovation Scoreboard 2018: Europe must deepen its innovation edge*. Available at [https://ec.europa.eu/growth/content/european-innovation-scoreboard-2018-europe-must-deepen-its-innovation-edge\\_en](https://ec.europa.eu/growth/content/european-innovation-scoreboard-2018-europe-must-deepen-its-innovation-edge_en)

## 1.2. Realisation of Innovation Biocamps for early stage entrepreneurs

Another part of the BioBase4SME project involved trainings, workshops and ‘Innovation Biocamps’. Innovation Biocamps were 5 days long and dealt with all aspects encountered when launching an innovation in the market. These one-week intensive entrepreneurship courses, organised by BioVale for innovative bio - economy start-ups, took place in the UK (twice) and the Netherlands. The Innovation Biocamps were well attended and highly praised as further explained in chapter 3 BioBase4SME Innovation Biocamps.

## 1.3. Successful implementation Innovation Coupon Scheme

One further objective of the project was providing support through an innovation coupon scheme. The innovation coupon scheme was very helpful to SMEs and start-ups because it was offering services to SME’s through a system of coupons that supported them in their innovation and created a huge leverage effect. The coupons were especially used to support SMEs that innovate in the industrial biotechnology technologies (one of the identified key enabling technologies in Europe) or to support valorisation processes for organic waste stream.

Chapter 4 BioBase4SME innovation coupon scheme, provides details about the strategy and impact of the coupon innovations implemented and in which around 1.5 M€ were made available to entrepreneurs.

## 1.4. Key outcomes towards project objectives

- Transnational impact of services provided: > 40% of the services (based on their value) have been delivered by service providers from another country than the applicant SME.
- Creating of a strong, interregional support network for biobased innovations manifested in a memorandum of understanding.
- Communication Final Event:
  - [Pitch perfect and boost the European bio -economy](#);
    - a cross-border pitching and matchmaking event with 140 participants.
    - 44 SME’s or start-ups, 7 investors, 11 RTO’s, 11 governmental institutions and 21 innovations service providers.
    - Around 60 pitches
    - > 234 match meetings
  - [SMEs rise through EU-wide cooperation - Building cross-border value chains for the bio - economy](#)
    - Dinner Debate in the European Parliament with 24 policy stakeholders
    - 3 strategic key messages:
      - a. the importance of a co-financing system;
      - b. availability of cross-border services and value chains to generate a pan-European ecosystem;
      - c. the need to set up a voucher system to allow companies to use services offered by actor outside their region.

- Overall improvement in the bio - economy since 2014, as seen by a decreasing average barrier score across countries.
- Decreased disparity between biobased innovation capacity in Ireland compared to the rest of NWE → Public investments, both in R&D and demonstration projects improved.
- A clear indications of needs and barriers that SME's encounter when innovating in the bio - economy in NW Europe.

Identification of three most important barriers that were seen as actively preventing business development:

- **Demand-side policy barriers (1st top barrier)**

3 barriers identified in this category: lack of commercial frameworks (e.g. incentives, taxation, market supports and product standards), lack of green public procurement and lack of biobased public procurement.

- **Stakeholder Perception (2<sup>nd</sup> top barrier)**

5 barriers identified in this category: 50% rated 'lack of stakeholder knowledge' and 'lack of communication of biobased benefits' as high barriers. 1/3 rated 'lack of labelling', 'lack of understanding of industrial biotechnology', and 'negative media messages' as high barriers.

- **Investment barrier (3rd top barrier)**

The biobased sector is perceived as high risk by investors because of a lack of visible products, the long time needed for return on investment and lack of investor confidence. Main barriers to capital requirements are: 'public support for scale-up activities' and 'financial support for new production facilities'; 'existing pilot facilities did not have all the necessary equipment under one roof (or had restrictions on what could be done)' and 'seeking funding for demonstration facilities'.

- 19 transnational workshops organised all over the 7 regions.
- 3 Innovation Biocamps with 56 participants in total.
- 11 transnational training events close to regional borders

### 1.5. Additional key outcomes

- Support to BioVoice was initiated: ongoing initiative by REWIN
  - BioBase4SME network could scout companies from NWE for challenges with biobased solutions. A first run took place in the Netherlands and should be broadened up, so the reach towards SMEs in the NWE area will be bigger.
- Global Biobased Businessplan Competition (G-BiB) for youngest entrepreneurs.
  - A competition for students in Germany and Belgium to stimulate entrepreneurship and innovation producing a bio-renewable chemical, material and/or fuel products.



## 1.6. Key documents released

- [Training Guide Social Acceptance](#) - Developing dialogue with your stakeholders. Applying social acceptance tools to avoid barriers in biobased innovations.
- [Report on needs and challenges of SME companies in the bio - economy in NW Europe](#)
- [Joint strategy and action plan containing policy recommendations to stimulate the biobased economy in North West Europe](#)
- 3 webinars about [outcomes, technical and non-technical services](#)
- [Report on Project Strategy and impact – First outcomes August 2019](#)
- [Bio - economy factsheets](#); provide compact overviews about NWE regions and its bio - economy innovation technology systems.

## 1.7. Key communication and dissemination channels towards general public

Reaching out to the general public and creating public acceptance for biobased innovations was most frequently done over the project website, mailings, newsletters and social media. In total more than 1500 followers could be reached by the end of the project using Twitter as the main social media channel.

The most frequent Twitter accounts used are: @BioBase4SME, @BioeconomyIRL, @BioVale\_Cluster, @ NNFCC, @CLIB2021, @FlandersBBV, @materianova, @AC3Atlantique, @Noveatech, @nvrewin, @BioBaseEuropePP

## 2. BioBase4SME Innovation support for Irelands bio – economy

### 2.1. Motivation for enhancing the innovation capacity

There was no recognised bio - economy in Ireland, at the starting point of the project in 2013/2014. Of all the countries in the NWE region, Ireland had the largest cuts in government spending after the economic crisis, which affected all industries, including the bio -economy. Nevertheless, there was a high amount of material availability on feedstocks and feedstock material available from waste. Other reasons include the composition of the Irish bio - economy, which is focussed heavily on the food industry as well as the lack of bio - economy pilot plants in Ireland.

- Side Note: The fact that in Ireland over half of people aged 25-34 have completed tertiary education in Ireland, helps to explain why Human Resource (HR) is a low barrier, whereas it was the highest barrier in the other NWE countries investigated.

Additionally, relevant pre-pilot equipment for anaerobic digestion and pyrolysis was scattered around the different universities NUI Galway Ryan Institute and partner University of Limerick. For some time, it was difficult to bring the pieces together, but one measure taken was the consolidation of a suite of anaerobic digestion and pyrolysis kits in the one centralised host facility in Ireland -all under the one roof at Thurles Premier Green Energy with the promoter cluster tcbbResource.

The usage of 1 single location for the pre-pilot facility to run pyrolysis tests

- brought results that was used to promote concept development with SMEs in Ireland,
- utilised cross boarder cooperation with N. Ireland and Great Britain (UK) and
- created a leverage effect from 5-6 digesters from zero gas up to 100 digesters.

### 2.2. Pre-pilot line service offer

Another measure was the integration of pre-pilot services in the coupon scheme and its availability for the NWE region. With increased emphasis on communicating about the existence and the benefits of making use of the central test centre run by TCBB-Resource, the following activities have been successfully implemented.

- 4 Irish SMEs tested new processes in real life conditions via the coupon scheme.
- Pursuing cross border collaborations between Irish SME's and experts and/or SME's in other NWE jurisdictions.
- Increasing the capacity and capability of its pilot plant facilities by completing additional investment in gas analysis equipment that can be utilised by SME's in support of anaerobic digestion or pyrolysis activities and that helped already one SME in their first commercial rollout of its pyrolysis plant in Wales.
- Demonstrating use of the AD to support development of a Volatile Fatty Acid biorefining protocol that SME's can use to extract added value from biowastes and residues.

- Demonstrating use of the pyrolysis equipment to recover renewable energy from biowaste sludges, which will enable waste management companies to valorise materials that have previously incurred a management cost in respect of disposal.
- develop a circular process for valorising livestock slurry residues in a community based renewable energy system. The system engages SME's throughout the value chain from feedstock suppliers to technology developers to energy users as well as stakeholders in governmental positions who may need to adapt commercial frameworks to enable rollout of the biobased concept.

### 2.3. Ireland's bio - economy long term stakeholder network

- **Other funding projects:**
  - Science Foundation Ireland (SFI)-funded IETS BIO3 project
  - Interreg N.W.E. co-funded REDIRECT
  
- **With national bodies:**
  - Environmental Protection Agency, Sustainable Energy Authority of Ireland and Enterprise Ireland (for emissions, renewable energy and technology development and assisted with the circular community renewable energy concept).
  - Tipperary County Council and Limerick County Council (manage increases in the level of renewable energy incorporated into the energy mix as well as the environmental impact from management and disposal of various types of bio-wastes).
  
- **With national associations:**
  - Irish Farmers Association (largest farmers' representative organisation on island of Ireland on deployment of AD-related technologies for resource recovery and supporting the sustainability of livestock farming and dairying.) and
  - Irish Bioenergy Association on developments made on tcbb RESOURCE BioBase4SME pilot plant facilities and in the technology innovation and scale-up on farm slurries by sub-partner NUI Galway's Ryan Institute. Discussions in respect of how an enhanced renewable energy + nutrient recovery concept could assist to address the environmental and economic issues arising from continuing reliance on fossil fuels and chemically derived fertilisers.
  
- **Governmental institutions:**
  - Waste Policy & Resource Efficiency Section of Ireland's Ministry/Dept. of Climate Action, Communications & Environment.
  - Ireland's Ministry/Dept. of Agriculture, Food & Marine re. partner, sub-partners and BioBase4SME and previously BioBase NWE role in developing bio - economy networks in Ireland.

## 2.4. Success stories

- **Premier Green Energy** (development of a process for use of the pyrolysis technology to process bio-hazardous medical wastes)

*Outcome: transitions from a bio-waste to a source of renewable energy.*

- **Kilkenny Materials Handling Services** (developing a biomaterials agglomeration process that will assist sizing, densification and drying of biomaterials to make it easier to store, transfer, manage and use biomaterials in various valorisation capacities)

*Outcome: This development activity is being moved forward under an application to the Irish Economic Development Agency - Enterprise Ireland.*

### 3. BioBase4SME Innovation Biocamps

#### 3.1. Strategy behind

BioBase4SME Innovation Biocamps were fully funded, specialist trainings for start-ups and SMEs and their business, with a **value worth €7000** per participant. The target audiences were high-growth, knowledge-based, innovative SMEs and start-ups operating in the bio - economy and based in the Interreg North West Europe area. The focus was on entrepreneurs embarking on advanced manufacturing including:

- Spin outs from Universities and research institutions
- New businesses using industrial biotechnology for manufacturing or exploiting biowastes as feedstock
- New companies providing services for emerging biobased supply chains e.g. supply chain control, process engineers, metabolic engineering.

Participation in the Biocamp was limited to the most promising entrepreneurs, based on a transparent selection after a call for applications. The selection of participants was based on a desk assessment, reviewed by an expert panel including the partnership.

The Innovation Biocamps consisted of an intensive, week-long course that gave participating entrepreneurs the tools they needed to their idea and to grow their biobased businesses. Each session of the training programme started with a lecture from an expert in a key aspect of business growth followed by a group exercise mediated by an experienced facilitator.

- **How the entrepreneur benefited:**

- 1-1 mentoring sessions with successful business leaders and investors
- Masterclasses from experts in finance, regulation, risk and opportunity
- Live pitch to a panel of specialist investors, active in the sector
- Key note lectures from experts in finance, regulation, risk and opportunity
- peer-to-peer learning and networking with biobased companies from across NW Europe

- **What the entrepreneurs learned:**

- How to analyse the value proposition and develop the business model
- Identifying and securing customers and other people the business needs to grow
- How to address operations, intellectual property and risk management
- How to communicate effectively/ strategically with investors, customers and suppliers

- **What was included for the entrepreneurs:**

- all course materials
- all teaching, lecturing and mentoring
- investor pitch opportunity
- accommodation and catering at the location
- social programme to encourage networking

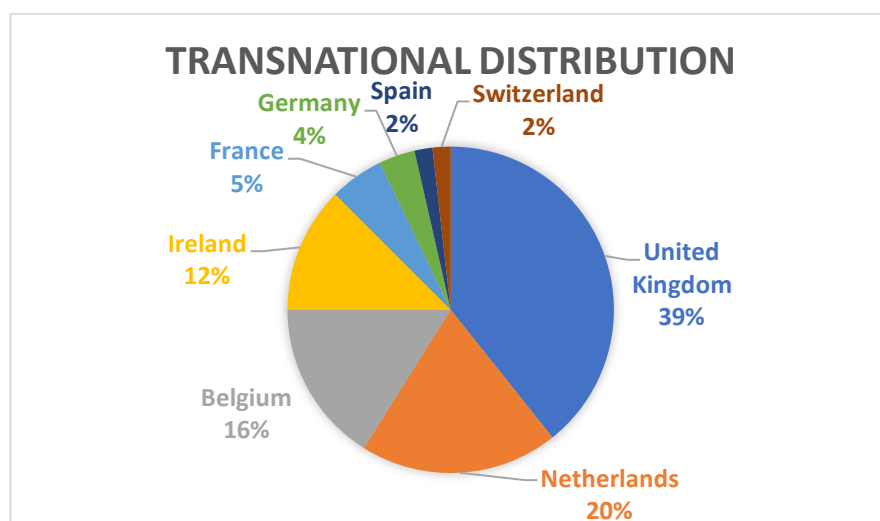
### 3.2. Promotion and Implementation

The Biobase4SME Innovation Biocamps were marketed very broadly by all project partners through: newsletters, websites, social media (LinkedIn, Vimeo and Twitter), and direct emailing. Marketing materials included video interviews of participants (2-minute video, used on website and 30 sec soundbites for social media), flyers and leaflets.

BioBase4SME **organised three Innovation Biocamps** during the project. Two Biocamps were held in York, United Kingdom (2017, 2018) organised and hosted by BioVale and one Biocamp was held in Bovendonk, the Netherlands (2019) organised and hosted by BioVale and REWIN.

- Side Note: These were the two countries where SMEs rated lack of qualified staff as especially large barriers as found out in the NWE survey on barriers in NWE.

As displayed entrepreneurs came from all-over North-West Europe to participate in the Biobase4SME Innovation Biocamps:



**The total number of individual entrepreneurs supported by training and mentoring within the Biobase4SME Innovation Biocamps is 56. Sixteen enterprises that received support are introducing new to the market products in the bio - economy.**

The entrepreneurs fell into one of the following categories:

- Founders just starting out (in business < than 1 year)
- Founders of more established companies (in business > than 1 year)
- Employees of start-up companies
- Intrapreneurs – employees establishing projects for commercialisation within companies

Some of the innovative technologies of these entrepreneurs included:

- Value from coffee waste
- New business model for recycling biobased plastic
- Biobased packaging from seaweed
- Biobased alternatives to fossil-fuel-based solvents
- Hemp-based construction innovation
- Phytochemistry made easy
- Biobased binders from agricultural by-products
- Biobased chemicals from new continuous process fermentation
- Breeding insects as a source of protein for animal feed

### 3.3. Follow up on business coaching

Follow up coaching from the Biocamp facilitators ‘Skillfluence’ was offered to the entrepreneurs and SMEs from the first two Biocamps to help them embed learning in their business and set new actions over the following year. The aim was to increase the medium- and long-term benefits of the learning the participants gained from the Innovation Biocamps. This facility was not offered to participants of the third Biocamp, because the BioBase4SME project closed soon after the event. Biocamp 2017 and 2018 follow-up with responses from 20 companies:

- Number of new jobs: 6,5
- New investments received: 14 (down round investment, seed investment)
- Grants applied for to secure investment: 28 (in total around 370 k€ of secured grant)
- Number of companies winning prizes/awards: 13
- Number of patents in process: 5
- Number of new to the market products: 3
- New to your company’ products: 6 (Demo unit built, a joint venture, new laboratory space, agreements with end-users)

### 3.4. Quotes from the participants of Biocamp 2017 and 2018

*“I anticipate this will be a worthwhile investment which will yield significant value for the sector in NE Europe.”*

*“Definitely learnt a lot. I think what was also really valuable was meeting other entrepreneurs and sharing our experiences and strategies, especially since we spent so much time together. This is a big plus of the event.”*

*“there is so much that I have taken from this course, skills, a time to look at my business without fire, reflection time, team building, networking and of course the people. I have enjoyed working with other innovative people learning from our mentors and hearing experts speak about innovation. For me the realisation that reflection must be done to learn from experience is the important take home point.”*

## 4. BioBase4SME innovation coupon scheme

### 4.1. Coupon scheme strategy

BioBase4SME enabled the knowledge flow between professional support services and entrepreneurs by implementing a coupon scheme throughout the project targeting at entrepreneurs (start-ups and SMEs) active in the bio - economy and either innovating by use of industrial biotechnology or around waste valorisation. The coupon amount varied (from € 4000 to € 100.000 max), and could comprise mix of services, especially combining technical and non-technical services, with a total service value of €100.000.

The workload for SMEs to apply for a service coupon was very low as the application procedure was kept to a minimum (4 pages application paper consisting of describing the business case and exploitation strategy, the innovative aspect, the requested service (technical feasibility), and a description of their team capabilities). The bio - innovation agents (networking partners) assisted the entrepreneurs with the application process. The coupon scheme was designed to give quick feedback to the applicant SMEs. Proposal/Applications could be submitted continuously, and every month there was a fixed evaluation moment. In general, a go/no go decision could be given 4-5 weeks after submission of the coupon.

As the coupon scheme was state aid relevant, the accompanying documents such as the terms of reference explained the implication of participation regarding state aid. Applicants were requested to sign a declaration stating that they are compliant with de minimis regulation.

### 4.2. Implementation of the coupon scheme

The coupon scheme was heavily promoted by all partners during all our interactions with the target group through word of mouth, banner, brochures, dissemination of impact analysis of the coupons at networking events, and emailing campaigns, newsletters, partner's websites, twitter, and LinkedIn as online tools.

The most popular technical service coupon was application testing, co-ordinated by REWIN, which aimed to reduce some of the technical risks associated with bringing a product to market. It should be noted that this was the only service that did not require SMEs to contribute 50%. Another popular service was bioprocess scale up, carried out by Bio Base Europe Pilot Plant. Both services aimed to remove some of the technical risks associated with the large investment needed for SMEs to reach commercial scale production. This reflects the survey result, with demand and investment being ranked as high barriers. A third technical service on anaerobic digestion and pyrolysis, carried out by tcbResource, also proved popular once some investment in equipment was completed.

The interest in the coupons for non-technical innovation services, such as Life cycle assessment (LCA) carried out by Materia Nova and social acceptance, carried out by AC3A, was less than expected, so the communication strategy to promote these coupons was re-evaluated. After change in communication strategy, and with a targeted communication effort, the demand for



non-technical services increased. This might also reflect the fact that the bio - economy is becoming more mature, and that customers increasingly demand proof of the better environmental performance of any biobased product. The change in communication strategy entailed the use of other wording e.g. “eco-design” instead of LCA. It was surprising that so few SMEs used these services, particularly social acceptance training, because as seen in our survey “Barriers for SMEs in NWE”, stakeholder perception was seen as one of the top barriers. This suggests that SMEs did not feel that they had any control over stakeholder perception (although the BioBase4SME social acceptance training<sup>5</sup> demonstrated clearly that SMEs can have a great influence on their stakeholders).

A further service coupon offered support with market research and identifying relevant regulations, carried out by NNFCC. Here, market research was more popular than work into regulations, which reflects the perception of regulatory barriers as less important than demand-side barriers.

The total amount made available to entrepreneurs during the innovation coupon scheme was around 1,5 M€. With this amount 73 different innovation services could be implemented for 63 different SMEs. The transnational service value is high as about 40% of the services implemented by service providers were not located in the same country as the applicant SME. Over the course of the project the consortium discussed in total 85 coupon application with 90 different requests for services in its monthly telephone conferences.

As expected, the flexible coupon scheme attracted SMEs in different stages of development and allowed for a tailor-made approach. In the following some output numbers are given about enterprises that received support during the coupon scheme implementation.

- **47 enterprises obtained an industrial proof-of-concept** and a professional business case for an innovation,
- **14 technologies**, products and processes were **developed and tested in real life conditions**.
- **14 enterprises supported** had innovations that introduced **new to the firm products**.

#### 4.3. Impact of the coupon scheme – First outcomes August 2019

For measuring the impact of the coupon work feedback from each supported company was collected using a questionnaire and approaching the SMEs 3 month after the execution of the coupon work and 1 year after the execution of the coupon work. It should be noted that 1/3 of the coupon work was only implemented in the last 6 month of the project duration until very closely towards the final date of the project. Therefore, the provided figures are at current time not presenting the whole impact figures, that would be theoretically available. The feedback collection is still ongoing, and an update is to be expected in late spring 2020. By this time 1 year has been passed after the execution of the work implemented and long-term developments by the company should be measurable. Small updates are expected to be published in the meantime.

---

<sup>5</sup> Handbook from the social acceptance training in BioBase4SME is available at [http://www.nweurope.eu/media/3974/social-acceptance-guide-pdf-version\\_22032018.pdf](http://www.nweurope.eu/media/3974/social-acceptance-guide-pdf-version_22032018.pdf)

### First outcome on the short-term impact (3 month) after execution of the coupon work

- For 85% of the SMEs that gave feedback the coupon work resolved the issue that they were describing in their coupon application.
- 93% of the SMEs stated the innovation track of the company was enhanced through “allowing us to demonstrate crucial steps of the process at a larger scale and provide more output material for testing of different applications”, “strengthened the business case by making a cost into a value which was greatly appreciated by our investor”, “to speed up the development of our pipeline products”,” the work has also allowed us to rank these products in order of priority, based on commercial attraction (e.g. market value, market size) and technology readiness levels.

### First outcome of the long-term impact (1 year) after execution of the coupon work

The timeframe envisaged to commercialize the product/process is with the most SMEs for about 1-2 years and the other half at 3-4 years, that goes in line with the expectations of the company growth which will be most likely in staff creation (hiring application developer, process engineer, team for production, sales person, ...) and equipment/ investment or even create another spin-out with a new market entry.

- Created new jobs: each of the company that gave feedback, reported, that in average they created at least 0.7 new jobs.
- Create new jobs in the future: 222 in the next 2 - 4 years
- Attract investors and how much capital: 42.5 M€; other feedback was that it helped in attracting investors or in negotiations with them.
- Applied for national/European funding: 11 with 7M€ (750 k€ secured grant; 3 SMEs)
- Pilot line build for scale-up/development: 7 SMEs expecting to build up a pilot plant with an own investment of total 14 M€. Nevertheless, a similar number of SMEs declared they want to use existing pilot lines as CMOs.
- Demonstration line for production: In the next 5 years the investment is expected of about 68 M€ for another 6 SMEs to build production factory/ small-scale commercial unit.

#### 4.4. Success stories of the BioBase4SME innovation coupon scheme

##### 4.4.1. Plantics

Website: <http://plantics.nl>

Plantics applied for a BioBase4SME coupon in July 2017 and got in touch with REWIN for expertise they needed on natural fibers. They have a patented biobased polymer that acts as a thermo harder which is recyclable. To use this polymer, they explore different opportunities for applications. One application would be: using it as building material (replacer of PUR foam). The coupon work was executed in December 2017. After the coupon 4000 euros for the Natural Fiber Application Center, Plantics won prizes for their polymer. The Fibertastic award (coorganized by BioBase4SME) and later the EFIB pitch-fest in Toulouse. The coupon also led to further cooperation outside the BioBase4SME project.

*“An important extension of our network (Natural Fiber Application Center) and results that helped us to understand our product better and, in that way, to define the next steps in our product development.” Wridzer Bakker, CEO Plantics*

#### 4.4.2. Chrysalix

Website: [www.chrysalixtechnologies.com/](http://www.chrysalixtechnologies.com/)

Chrysalix applied for a BioBase4SME coupon in June 2017. Chrysalix is a spin-out company developing an innovative biomass fractionation process using low-cost ionic liquids. With BBEP they could make a full-scale trial to obtain pilot data and product and therefore demonstrating scalability of the technology. BBEP work with them was completed in March 2018.

*“We are currently starting a fund-raising round where these tests are a crucial part of demonstrating a higher TRL than before. This will allow us to justify a higher valuation.” Chrysalix Technologies Limited*

#### 4.4.3. Ashleigh Environmental

Website: <http://ashleighenv.com>

Ashleigh Environmental applied for a BioBase4SME coupon in September 2017. They are an Irish clean-tech SME based in Co. Waterford (south-east) and have been developing its proprietary microwave treatment system called ‘Biowave’ for the past eight years and recently completed their industrial-scale pilot plant. Their ‘Biowave’ microwave system has recently been designed to treat organic by-products, such as slurries, within a biogas production process. Together with tcbResource the separator specification has been integrated into the project system design and tests on its appropriateness are currently underway. Another novel approach to separation that will be investigated with TCBB RESOURCE is going forward. The coupon work was executed in December 2017.

*From their feedback form: How will the results be used in commercialisation process? “This will depend on the performance of the vibrating screen separator over the course of the next 6 months. Thus far the results look positive and recommended equipment fits in well with the commercial process.” Ken McGrath, Ashleigh Environmental*

#### 4.4.4. OxfordBiotrans

Website: <http://oxfordbiotrans.com/>

Oxford Biotrans applied for a BioBase4SME coupon in January 2017. The company will develop and commercialise enzymatic process technologies that yield high-value chemical compounds. Their first product will be natural-grade nootkatone made by biotransformation of natural valencene. With BBEP they performed significant scale-up optimisation and have significantly improved their process. BBEP work with them was completed in February 2018.

*“We will use the optimised enzyme production in our next manufacturing run to product natural-grade nootkatone. The process will also be used in other pipeline product work. The optimised fermentation is at a sufficient development stage to now be used in our commercial production of nootkatone.”, Matthew Hodges, Oxford Biotrans Limited*

#### 4.4.5. Plaxica

Website: <https://www.sappi.com/sappi-invests-sugar-separations-and-clean-technology-strengthen-its-renewable-bio-chemicals-offering>

Plaxica applied for a BioBase4SME coupon in February 2017. They had developed a process, “Xylex”, to produce sugars from a waste stream from the pulp industry. These sugars could have many potential applications, and they asked NNFCC to carry out market research into the most promising applications. NNFCC’s work with them was completed in July 2017. In September 2017, Plaxica were bought by their long-term collaborator Sappi (a global pulp and paper company). All the employees were taken on by Sappi, and Plaxica were very happy with the deal. NNFCC’s piece of research, about “Generating Revenues from Hemicellulose-derived Sugars”, was crucial to them securing this deal because it demonstrated to Sappi that their process had concrete applications for which there was a market demand.

*The feasibility study has identified several potential partners with fermentation or chemical technologies to produce high value products from mixed sugar feedstock. The work has also allowed Plaxica to rank these products in order of priority, based on commercial attraction (e.g. market value, market size) and technology readiness levels.*

*Additional Comments: We would not hesitate to strongly recommend similar projects to other SMEs in the bio-based products field.*

*Dr Ed Marshall, CTO Plaxica.*

**The BioBase4SME network are:**



BioBase4SME was 60% funded by the INTERREG NWE Programme. The Interreg North-West Europe Programme fosters transnational cooperation to make the North Western Europe a key economic player and an attractive place to work and live, with high levels of innovation, sustainability and cohesion. <http://www.nweurope.eu/>

**BioBase4SME is co-financed by:**



Avec le soutien de la



Wallonie