

WPT4

D.T4.1.11

Transnational industrial innovation roadmap for the  
Bioeconomy sector

Version 1  
7.2021





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Authors:	PP7 – Wroclaw Technology Park PP9 – Bioeconomy Cluster
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## 1 INTRODUCTION

CHAIN REACTIONS project addresses the challenge for industrial regions not benefitting from innovation activities from large leading corporations to increase regional capacity to absorb new knowledge and turn it into competitiveness edge and business value.

New products and services, as well as new industrial sectors are not always the result of breakthrough innovation; they can be the result of value chain innovation, e.g. the transformation of 'traditional' value chains into new ones - emerging industries - through cross-border and cross-sectoral collaboration. The analysis of those emerging value chains shows that beyond their specificities, they have in common some key drivers: Key Enabling Technologies, Resource efficiency, Digital transformation and Service innovation. For many businesses, integrating durably the complexity of value chain innovation processes represents a challenge hampering sustained growth.

There is a strong need to help SMEs to overcome capacity shortages for innovation and integration into transnational value chains. The project aims at empowering regional ecosystems with the knowledge and tools to help businesses overcome those barriers and generate sustained growth through value chain innovation. CHAIN REACTIONS project builds thereby on modern approaches considering value chains and their complex developments rather than linear technology transfer approaches. The focus is on key sectors: advanced manufacturing, ICT and electronics, energy and environment, health and bioeconomy.

The objective of WPT4 is to create truly transnational open spaces for collaboration (e.g. value chain based) for RIS3 implementation. Ensure the sustainability of the project outputs beyond the project.

The following activities shall be performed:

1. Building on the regional IGAs (WPT2), the models and instruments (WPT1) tested in pilots (WPT3), the PPs will set-up transnational networks of relevant innovations stakeholders in each of the selected industrial sectors, which will perform jointly a foresight exercise (workshops) and develop the previous results into industrial innovation roadmaps, i.e. trends and expected innovations over time (5-10 years) for each of the selected industrial sectors. The roadmaps shall include necessary developments (in general) to make the expected innovation happen. Lead: STP, all PPs
2. Each industrial roadmap will be then further developed into transnational industrial innovation agendas, i.e. concrete innovation activities to be performed in the project regions and transnationally in order to realize the necessary development identified in the roadmaps and ensure industrial leadership in the selected industrial sectors. Those agendas shall be coherent with S3 in the project regions and provide the basis for potential future joint activities and transnational investments. Lead: STP, all PPs
3. Finally, PPs will define in parallel to the roadmaps transregional exploitation plans for the time beyond the project, aiming at providing guidance with respect to:
  - The use of the knowledge collected and developed during the project lifetime;
  - The implementation of innovation activities as identified by the members of the transnational networks; Establishment of durable transnational open spaces for collaboration in the selected industrial sectors.



## 2 A ROAD TO TRANSNATIONAL INDUSTRIAL INNOVATION ROADMAP

Following the regional IGAs' actions of the support and implementation of transnational pilots aiming at supporting value chain innovation (WPT3) and establishment of transnational networks of innovations stakeholders as the kick-off activity to develop transregional innovation networks and agendas (WPT4) in selected industrial sectors (WPT4), the main activity of the sectoral partner duo is to contribute to the project output O.T4.1 Thematic industrial innovation roadmaps (TIIR).

For the purposes of TIIR development of the bioeconomy sector two (2) transnational industrial innovation roadmap workshops were implemented, with the main objective to collect relevant inputs for elaboration of TIIR and later on the transnational industrial innovation agenda for the target sector, in order to perform a foresight exercise and identify relevant sectoral trends and to present the possible evolution paths of the considered value chains and innovations within the target sector over a period of 5-10 years.

## 3 TRANSNATIONAL INDUSTRIAL INNOVATION ROADMAP

### 3.1 Trends

The bioeconomy, like many other industries, is adapting to new scientific discoveries and technical advancements. The bioeconomy and digitization go hand in hand, and **the Industry 4.0** as well as **Agriculture 4.0** provide new opportunities for the farmers. Digitization helps to simplify some processes and reduce the need for manual work in some stages of production. The transformation of existing business models, as well as numerous technologies and service networks, will allow the emergence of new styles of cross-sectoral alliances and value chains, which are part of the digital revolution in agri-food.

Technological change is also a vision for innovative and sustainable farming - for Slovak farmers and breeders, new innovations are becoming more familiar and widespread, and they are starting to use technological advancements in real life. However, still only some of these farms are top innovative in their market segment or in the way they produce their goods.

Digital transition as well as transition to a green circular model of the economy are important for the environmentally and economically sustainable growth of the bioeconomy. It is also necessary to have qualified information and best practice examples, which are successfully applied in practice and transferrable to other applications.

Many SMEs from the bioeconomy sector still have insufficient knowledge about the possibilities of implementing modern production and innovative management solutions. Considering the importance of this sector for both economies, i.e. Slovakia and Poland, it seems to be necessary to establish constant cooperation, exchange information and experiences mechanism, between the actors of the digital 4.0 transformation process. The transnational relations will be based on the triple helix model as ensuring the inclusion of all relevant stakeholders in the transformation process.



### 3.2 Priority Innovation Actions

PP	Suggested innovation action	Description	Timeframe	
			From	To
PP7 WT P	Transnational Show room	<p>1. Transnational transfer of knowledge between <b>NUTRIBIOMED Cluster (coordinated by the WPT) and Bioeconomy Cluster from Nitra</b>. Cluster members belong to small and medium-sized enterprises sector have limited capacity for international cooperation. The main objective of this action is to trigger experiences transfer related to the implementation of innovations gained by the BEC and Nutribiomed cluster as well as their members.</p> <p>2. Exchange of information and experience on technological opportunities as well as promotion of innovation providers within international network via information channels of project partners and other events (newsletters, mailings, www, webinars, conferences).</p> <p>3. Exchange of knowledge &amp; information between IGA Wroclaw and IGA Nitra. Both partnerships plan to set up regular meetings in order to build a common strategy to support digital transformation and implementation of 4.0 solutions in the bioeconomy industry.</p>	05/2021	05/2026
PP7 WT P	Regional Show room	<p>1. Organization of a <b>series of webinars</b>, conferences with the participation of companies from the food and bioeconomy industry, in which innovative solutions of Industry 4.0 and ICT dedicated to food and bioeconomy producers will be presented. Four events per year.</p> <p>2. Launching the <b>Innovation Exchange</b> in order to publish information on innovative technologies in Industry 4.0. Information concerning innovative solutions and possibilities of providing funds for investments will be published in the Nutribiomed Cluster and BEC newsletters and social media. Survey of needs and barriers of implementation of innovations within business entities (twice a year). The processes of implementing innovative solutions in the SME's environment encounter various limitations, e.g. in the form of stereotypical thinking. Analysis of needs and barriers related to the</p>	05/2021	05/2026



		<p>implementation of innovations will contribute to customization of solutions offered to SMEs.</p> <p>3. <b>Meetings (webinar/conference/direct visit) with companies involved in project DIH Wroclaw.</b> WTP will seek to increase synergies between the activities of the DIH Wroclaw project and CHAIN REACTIONS project. The knowledge gained from the synergies will allow to animate digital transformation of the companies.</p> <p>4. Annual report summarising the effectiveness of the actions and describing the barriers of implementing innovative solutions (by using case study, if applicable). The report will operate as indicator of innovation uptake within the SMEs, and will enable to indicate the recommended corrective actions.</p>		
PP9 BEC	Support for the green and digital transition of the agri-food sector	<p>National platform AgroBioFood Nitra, which acts as IGA in Nitra region within CHAIN REACTIONS will make steps towards the establishment of <b>regional DIH in Agri-food</b>.</p> <p>Even though it will be a regional DIH, transnational cooperation and transfer of knowledge will be necessary to make all the steps towards the establishment of fully-operational DIH, which will act not only regionally, but will search for the collaboration opportunities at international level as well. The aim is to be registered in the DIH catalogue within the JRC S3 platform, with a potential of becoming the European DIH in the future.</p> <p>The idea is built on the strong potential of Nitra region in agri-food production, infrastructure (digital, research infrastructure for food, nutrition and health (FNH-RI), centres of excellence, etc.), human potential and capacities and evolving agri-food knowledge and innovation ecosystem.</p> <p>This action includes:</p> <p>1. <b>Transnational transfer of knowledge</b> from experienced partners running fully-operational DIHs – BEC will exploit the opportunities stemming from its involvement in CHAIN REACTIONS to learn about digital business models of selected project partners, mainly PBN, STP and WTP.</p> <p>2. <b>Incorporation of the idea of DIH in Agri-food into regional strategic documents</b></p>	06/2021	06/2025



		<p><b>for the period 2021 – 2027</b>, which is based on the cooperation with Nitra self-governing region and participation of BEC in the working group “Agri-food complex” for the preparation of the Programme of economic development and social development of the Nitra region until 2030. This activity includes the allocation of resources for the implementation of the idea.</p> <p><b>3. Preparation of digitalization strategy</b>, which could partially build on already existing strategy of BEC in the area of development of intelligent bioeconomy as well as on the latest developments in digitalization in Slovakia and in Europe.</p> <p><b>4. Preparation of working documents to set-up a DIH</b>, starting from the collection of data and review of methodology and guidelines for the establishment of DIH. This activity involves the strategy and action plan of DIH, including the participative networking of relevant stakeholders and organizational and legal aspects of the establishment of DIH.</p> <p><b>5. Registration of DIH in S3 platform of JRC</b> – DIH incorporated in the official DIH catalogue.</p> <p>The proposed activities and services of DIH include, e.g.:</p> <ul style="list-style-type: none"> <li>- <i>DIH 4 SME</i> - support to the adoption of new (digital) business models by farmers, start-up awards/support, own funding mechanism for the financing innovations in bioeconomy/agri-food (voucher system), co-working centre, incubator, etc.</li> <li>- <i>DIH Soft Skills</i> – trainings, workshops, study visits focused on the development of human resources.</li> <li>- <i>DIH Goes Cross</i> – cross-sectoral cooperation in the topics of the environment, social innovation, circular economy, etc.</li> <li>- <i>DIH Goes International</i> – international cooperation, projects, as well as links to other European DIHs.</li> </ul>		
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### 3.3 Conclusions and recommendations

BEC will act as a facilitator of the innovation action related to the green and digital transition of the agri-food sector. BEC will collect the information about digitalization opportunities from relevant project partners (mainly within its pilot) and will use this information to start the procedure of establishing the regional DIH in Agri-food. Mainly the knowledge of DIH Wroclaw and partners from Slovenia and Hungary will be used. In addition, close cooperation with regional partners is envisaged, especially with IGA for Nitra region. Most members of IGA are also part of the National Platform AgroBioFood Nitra, which is well established structure in the regional context and with good outreach to international environment and thus, there is a good promise of future sustainability of proposed actions.

This innovation action should lead to the application of new business models and new technologies by farmers, which includes also the adoption of sustainability-oriented innovations (organizational, institutional, managerial, etc.) and transition to green and resource-efficient models of production. Specific recommendations for each action will be proposed within industrial innovation agenda for the bioeconomy sector as well as within the transnational exploitation plan, which will be prepared in the next phases of CHAIN REACTIONS.

WTP identifies entities, that are looking for innovative solutions in Industry 4.0 and the digitization of production, management and sales processes. As part of implementation of pilot action, WTP created a collaborative platform which will maintain after the end of the project. WTP will take steps to make the platform active, attractive to users by presenting practical, up-to-date solutions. In order to accelerate digitalization, WTP forecasts to organize meetings between providers of Industry 4.0 solutions and companies facing digital transformation process. WTP will play brokering role by match-making companies with high-tech manufacturers. Activities will be carried out with engagement of companies involved in DIH Wroclaw project.

WTP will also organize meetings and publish information in the Nutribiomed Cluster newsletter focused on raising awareness on Industry 4.0 for traditional and conservative industries. WTP will keep up-to-date database presenting modern solutions from Industry 4.0 in the bioeconomy industry. The Nutribiomed cluster brings together approximately 100 entities from the life science industry, including 72 SMEs. Meetings, will be held during the Cluster Council, and will be organized on average once a quarter.

The aim of our activities is to establish constant, based on the exchange of good practices, transnational cooperation among SMEs in the bioeconomy sector, focused on increasing the efficiency of the implementation of technological solutions within Industry 4.0 and ICT sectors. The activities undertaken by the WTP should lead to the increased use of new technologies in the SME's sector. We assume that the measures will also allow companies to switch to "green" technologies including CE models.



**CHAIN REACTIONS**

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**7. ANNEX: TRANSNATIONAL INDUSTRIAL INNOVATION ROADMAP**

TRANSNATIONAL INDUSTRIAL INNOVATION ROADMAP – SECTOR: Bioeconomy																						Created by: Bioeconomy Cluster		PP9
Timeline																								
No.	Activity	Category	Indicator / Output	2021		2022				2023				2024				2025				2026		
				Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	
1	Support for the green and digital transition of the agri-food sector	DIH	1. Transnational transfer of knowledge 2. Incorporation of the Idea into regional strategic documents 3. Digitalization strategy 4. Official DIH set-up 5. Registration in DIH catalogue	→		→				→				→				→				→		



**CHAIN REACTIONS**

TRANSNATIONAL INDUSTRIAL INNOVATION ROADMAP – SECTOR: Bioeconomy																				Created by: [insert PP's name]		PPXY	
Timeline			2021		2022				2023				2024				2025				2026		
No.	Activity	Category	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	
1	Transnational Show room	Web platform	1. Transnational transfer of knowledge between NUTRIBIOME Cluster (coordinated by the WPT) and Bioeconomy Cluster from Nitra.		→		→																
			2. Exchange of information and experience on technological opportunities as well as company's expositions and its offers within international network via information channels of project partners and other events.		→		→																
			3. Meeting/ exchange of information of IGA Wrocław with IGA Nitra				→																
1	Regional Show room	Web platform	1. Webinars, conferences with the participation of companies from the food and bioeconomy industry, in which innovative solutions of Industry 4.0 and ICT dedicated to food and bioeconomy producers will be presented.		→		→				→				→								
			2. Innovation Exchange		→		→				→				→				→				
			3. Meetings with companies involved in project DH Wrocław.		→		→																
			4. Annual report		→		→																

\*text in the 1st row serves as an example