

WPT4

D.T.4.1.3

Transnational Network of innovations stakeholders
for the Energy & Environment sector

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Abbreviations

IGA – Innovation and Growth Alliance

PESTEL - Political, Economic, Social, Technological, Environmental and Legal factors

PP – Project Partner

RDI – Research, Development and Innovation

RIS3 – Regional Strategy for Research and Innovation for Smart Specialisation

SME – Small and Medium Enterprise

TEP – Transregional Exploitation Plan

TIIA – Transnational Industrial Innovation Agenda

TIIR – Transnational Industrial Innovation Roadmap

TNIS – Transnational networks of innovations stakeholders

TOSC – Transnational open collaboration space

WPT – Work Package



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. 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.

Building on the developed regional IGAs (WPT2) and the models and instruments (WPT1) tested in pilots (WPT3), the PP10 R-Tech and PP2 STP are setting-up transnational networks of innovations stakeholders (TNIS) in the selected industrial sectors of Energy & Environment. The developed transnational network 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), forming the basis for collaborative value chain innovation processes.

Following the regional IGAs' actions of the support and implementation of transnational pilots aiming at supporting value chain innovation (WPT3), the main activities of transnational networks of innovations stakeholders are to develop transregional innovation networks and agendas (WPT4) in selected industrial sectors, in particular to contribute to the following project outputs:

- O.T4.1 Thematic industrial innovation roadmaps;
- O.T4.2 Thematic innovation agendas;
- O.T4.3 Thematic transnational exploitation plans and open collaboration spaces.

2 STRATEGIC AND ORGANISATIONAL CONTEXT

Transnational network of innovations stakeholders for the Energy & Environment sector builds its strategy on the performed Value Chain Analysis on one hand, and developed Transnational Pilot on the other, presenting the main guidelines for planning and implementing defined sectoral actions.

Value chain analysis builds on the results of a combination of classic methods (Porter's Five Forces, PESTEL analysis, Business Model Canvas) with the specific approach of CHAIN REACTIONS (innovation drivers) and the regional specificities of the target environment. The main aim of the transnational pilot was to define collective actions to implement the potentials for value chain innovation processes identified during the value chain analysis of Energy & Environment sector carried out within the project.

Pilot enables the project partners and their key regional stakeholders to deepen their knowledge of value chain innovation processes in general and a deep understanding on how they apply specifically in regional businesses and value chains. By using the models and instruments developed they will reach autonomy in the use of models and instruments for supporting and monitoring innovation in their home region and will be able to contribute to transnational innovation processes.

The current transition of energy systems poses major challenges in the sector energy and environment. This transformation is highly encouraged by policymakers due to the negative effects of common fossil fuels for the climate. The electrification of the transport industry is an important branch to achieve this goal, as it is one of the main emitters. As a result from the value chain analyses it becomes evident



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that future electric vehicles will be connected by a fast data connection to a cloud or to a service platform and this will enable a host of new functions. These functions may include apps that allow motorists to book parking space and charging stations, for instance, or to have special offers displayed based on the driver's position. Furthermore, it will be possible to perform much more detailed and intensive remote maintenance, diagnosis and software updates for vehicles. An overarching platform is to collect, evaluate and process the data from the vehicles along with route planning. In this way, individual proposals can be provided to motorists in order to optimise travel time, including proposals for using charging stations.

It is necessary to explore the implementation of new technologies for cross-industry cooperation of energy systems and e-mobility. A series of Transnational Pilot workshops will boost cooperation by transferring knowledge from the different sectors between Chain Reactions partners.

The Transnational Pilot workshops will be organized by R-Tech virtually with the aid of online cloud tools. The transfer focusses on cross sectoral topics, the sector electromobility and the sector energy systems. A typical workshop will be structured in a presentation held by a local expert, a Question & Answers session and a concluding idea generation session. The participants will have the opportunity to analyse the major points of the presentation using online design thinking tools followed by an ideation step using a value proposition canvas as compiled in WTP1. We expect the output to include potential business ideas, value propositions and a portfolio of new technologies with potential. Ideally, the business models will extend to hydrogen technologies, automated driving and the expansion of municipal fleets of electro vehicles. To foster the generation of practical ideas, we schedule a follow-up with members of the IGA and SME after the second workshop in April 2021. The content of the first two transnational workshops will be analyzed using the value proposition canvas tool. This will allow the participants to reflect on regional trends, challenges and opportunities that have been presented so far. The outcome of the ideation process will be presented to the stakeholders in the final workshop in June 2021.

Respecting the results of Porter's Five Forces analysis the following specific regional aspects were defined for the e-mobility sub-sector:

<p>Threat of new entrants</p>	<p>In favour of entrants</p> <ul style="list-style-type: none"> Based on a long tradition in the automotive sector, Bavaria and particularly the region of Regensburg provide a promising framework for the foundation of new companies in this area due to the existing structures and networks. The university location Regensburg has a large number of excellently educated students and professionals and therefore provides good conditions for new firms 	<p>In favour of incumbents</p> <ul style="list-style-type: none"> The wage and investment costs in Bavaria are very high, what leads to a particularly high capital requirement There is a general shortage of skilled and junior skilled workers in mathematics, computer science, science and technology (STEM). The so-called "STEM gap" in the Regensburg region is intensified by competition with metropolitan regions Slovenia is an important link in the development of components for electric vehicles globally. Many
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	<ul style="list-style-type: none"> Slovenia has a long tradition of economic activities in the automotive/transport sector. High-skilled workers are available at more favourable conditions as in the countries of West / North Europe, which may stimulate new players to position their facilities there. 	<p>electric cars boast elements of Slovenian knowledge and production generated in the existing R&D and production players.</p>
Bargaining power of suppliers	<p>In favour of suppliers</p> <ul style="list-style-type: none"> In the areas of Bavaria and Regensburg car manufacturers and suppliers are both established. Based on the importance of both industries for the region, their concerns are equally weighted by policymakers. Car manufacturers as well as car component manufacturers have large development teams, ready to liaise in different project teams or bilateral projects to draw on knowledge and information on emerging technologies – in this context Slovenian participants are actively participating also in the field of electromobility. With the increase in the number of EVs, electricity consumption increases. Slovenia positions highly in the number of fast charging stations, as among Slovenian's electricity suppliers there is strong awareness that it is important to integrate the EV charging process into smart grid systems, which can make a significant contribution to the efficiency of customer and producer pooling. 	<p>Not in favour of suppliers</p> <ul style="list-style-type: none"> With the world-renowned car manufacturer BMW, Regensburg is home to a plant of one of such a financially strong company. Bavaria hosts BMW, Audi and the truck manufacturer MAN and is therefore one of the world's leading development locations in the field of electromobility. Slovenia is an important stakeholder in the development of components for electric vehicles. From basic development, through component development and production, car production, sales and maintenance of technologically advanced vehicles (which electric vehicles certainly are), to establishing comprehensive services for them, construction of charging infrastructure and providing energy to them, especially electricity from renewable sources. In Slovenia, that mostly hosts producers of components for the cars, there are some small producers of the vehicles also present, however without a significant strength to strongly influence wider markets, but rather to target specific niches.
Bargaining power of buyers	<p>In favour of buyers</p> <ul style="list-style-type: none"> For Slovenia we can say, that customers choose ecological solutions if this brings them price savings. Electric vehicles are nowadays highly advantageous in driving comfort, silence and non-exhausting driving, while they do 	<p>Not in favour of buyers</p> <ul style="list-style-type: none"> The problem of the electric mobility infrastructure in general, as well as in Slovenia, is the need for the long-term investment required, which is also necessarily linked to the critical mass of electric vehicles on the market.



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	<p>not quite reach conventional vehicles in terms of price yet.</p> <ul style="list-style-type: none"> • Basically, also customers in Germany are looking for products with the best price-performance ratio. Particularly regarding energy supply, the customers are, with a few exceptions to which environmental conditions are decisive, above all price fixed. The automotive sector is rather an exception. Since the car traditionally has a high status for Germans, many choose a brand made in Germany or remain loyal to a supplier over a long period of time. However, due to the low supply in the area of e-mobility and the declining emotional attachment to the car, German customers are now increasingly switching to other providers. 	<ul style="list-style-type: none"> • Without subsidies, electric cars are economically not yet fully competitive with conventional cars. This prevents many buyers from making a purchase despite a fundamental interest. Large-scale subsidies will make electric cars more attractive in terms of price, but the costs are still a major problem in making them attractive to the mass market. In addition, an electric car cannot yet optimally fulfil some of the promotion profiles such as long journeys, which is why it is still uninteresting for certain groups of buyers in Germany. • The lack of a speed limit in Germany also discourages many potential buyers, as speeds in excess of 200 kilometres per hour are desired, but hardly feasible with an electric car.
<p>Threat of substitute products</p>	<p>In favour of substitutes</p> <ul style="list-style-type: none"> • In Slovenia, The Hydrogen Technology Development Center (RCVT) was set up by five companies and two research institutes in order to accelerate the research, development and realization of applied projects in the field of hydrogen technologies, as potential alternative development activity for more widely spread electric mobility solutions. • The German state promotes various drive and mobility concepts. In particular, the hydrogen cell and the necessary infrastructure are actively promoted. Hydrogen is expected to play a major role in Germany, especially outside the passenger transport sector. E.g. by 2050, more than 65 percent of all forklifts are to be operated with a fuel cell. 	<p>In favour of incumbents</p> <ul style="list-style-type: none"> • Based on the two objectives directly related to electromobility in Slovenian strategic orientations, which are development of the charging infrastructure on the motorway cross and achieving 100% electric mobility in personal and public transport by 2055, e-mobility will be further favoured among alternative mobility options in Slovenia in the future. • Similar to Slovenia, Germany is fully committed to electric mobility. When it comes to promotion and incentives, no alternative concept is nearly supported as much as electromobility.



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<p>Rivalry among existing competitors</p>	<p>Aspect fostering rivalry</p> <ul style="list-style-type: none"> • In Slovenia (and wider), start-up companies are aware of the development and market opportunities in the global market. By accelerating development and investment they are seriously putting the electric mobility into position of becoming a real possibility for future mass mobility. By that, the existing companies which were initially restrained from e-mobility in order to protect already realized investments and tied assets to classic drives, are gradually forced in the same direction. • Due to the strong automotive industry in Germany, various large groups compete for market shares in the field of e-mobility. While the automotive market has been fairly stable in recent years, the introduction of electric cars and the associated new, highly competitive market has had a particularly strong impact on Germany. The more the car industry in Germany comes under pressure, the more the rivalry between the companies increases. 	<p>Aspect limiting rivalry</p> <ul style="list-style-type: none"> • Identified common development challenges among manufacturers may enhance their collaboration on certain development and production tasks, thus limiting rivalry and converting it into cooperation. • As a result of increasing competition from foreign manufacturers, the German automotive industry is trying to maintain its status as world market leader. To this end, the groups are working more closely together. Furthermore, based on the different chosen electrification strategies, most German suppliers in the field of electric cars are not direct competitors.
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Styrian region set the following objectives to be reached within the pilot project implementation timeframe:

- Overall Value chain innovation support and potential implementation within the interested SMEs;
- Pilot and transnational impact and support within the Slovenia, Croatia and Poland;
- Strengthening the transnational collaboration and Dissemination within the innovative SMEs and other related R&D&I institutions (Quadruple / Quintuple helix coverage).

The main activity of the Styrian pilot is development of Chain Reactions e-Mobility and Circular Economy Innovation HUB ("Hotspot") of Slovenia (Styria), comprising virtual demonstration / business model innovation lab for circular economy and e-mobility approaches and pilot e-learning hub (incl. on-line and on-site trainings for IGAs and stakeholders).



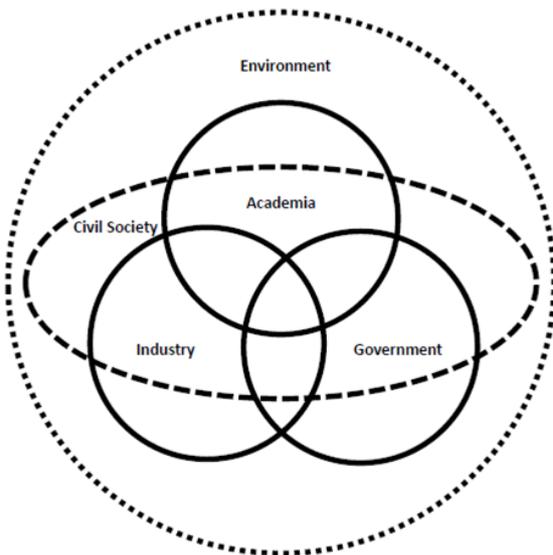
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R-Tech strategic objectives are the following:

- Support and stimulate the flow and exchange of knowledge between start-ups, SME and established enterprises across Poland, the Czech Republic and Germany.
- The promotion and establishment of transnational cooperation in the field of emobility based on the exchange of expert knowledge in various fields.

Based on the exchange of knowledge between companies and experts in the field of energy and mobility created by the events, the aim is to develop new business innovations and strategies or to further develop existing ones. By bringing together two key topics, energy and mobility, the planned workshops will provide companies that focus on one of these topics with expertise and practical experience and expand their range of services in both areas. Consequently, the first expected output of the workshops is that participants will turn to a bilateral approach for the integration of electromobility under consideration of energy aspects and that at least some new project ideas will be generated by this new approach.

2.1 Partnership



Transnational network of innovations stakeholders for the Energy & Environment sector is based on the quintuple helix system, representing knowledge as the core of the system which (circulating between societal subsystems) changes to innovation and know-how in a society (knowledge society) and for the economy (knowledge economy). Respecting the quintuple helix TNIS builds its operation on five subsystems (helices): education and economic system, natural environment, media-based and culture-based public (also 'civil society'), and the political system, emphasising the efforts on RDI, entrepreneurship and supporting public sector.

The network is consisted of the following partners:

Region R-Tech, Regensburg (PP10)	<ol style="list-style-type: none"> 1. BioPark Regensburg GmbH 2. City of Regensburg 3. Cluster Mechatronics & Automation 4. IHK Regensburg (Chamber of Commerce) 5. IT Security Cluster Bavaria 6. Ostbayerische Technische Hochschule Regensburg (OTH) 7. Universität Regensburg 8. R-Tech GmbH 9. Cluster Strategische Partnerschaft Sensorik e.V.
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	<ol style="list-style-type: none"> 10. Zentrum Industrie 4.0 11. Continental AG 12. Krones AG 13. Osram AG 14. InSys Microelectronics GmbH 15. Bertrand Technologie GmbH 16. Energieagentur Regensburg e.V. 17. Infineon Technologies AG 18. AVL GmbH 19. Microfuzzy GmbH 20. Bayernwerk AG 21. Das Stadtwerk Regensburg GmbH 22. REWAG AG & Co KG
Region of Styria, Slovenia (PP2)	<ol style="list-style-type: none"> 1. Styrian Technology Park 2. Maribor Development Agency 3. WCYCLE Institute Maribor 4. Regional Development Agency Posavje 5. E-Institute, Institute for Comprehensive Development Solutions 6. Technocentre (University of Maribor) 7. Digital Innovation Hub (University of Maribor) 8. TECES – Technological Centre for Electro Machines 9. Technology Network ICT Institute 10. FABLAB Network Slovenia (University of Ljubljana, Faculty of Electrical Engineering) 11. TECOS – Slovenian Tool and Die Development Centre 12. SPIRIT SLOVENIA – Public Agency for Entrepreneurship, Internationalisation, Foreign Investment and Technology 13. Chamber of Commerce and Industry of Štajerska 14. Slovenian Energy Agency 15. Faculty of Polymer Technology 16. Tushek Supercars Ltd. 17. EMSISO d.o.o.

2.2 Organisation and management

Management and coordination of Energy & Environment sector TNIS is provided by project partner duo PP10 R-Tech and PP2 STP. The management structure of the network is based on democratic principles, where all partners are equal.

For the project period, the above PP duo takes over the management role and acts as coordinators responsible for managing the operations and disseminating information among the network partners. The network coordinators are at the same time responsible for operational and technical matters in order to ensure the functioning of the network. After the project conclusion, the network partnership may reaffirm the existing ones or select a new network coordinator(s).

It is highly recommended that network partners provide professional support to the operation of the network in accordance with their professional competencies.



TNIS plays an important role as a regional and transnational promoter of value chain innovation in the Energy & Environment sector. The network will promote and guide the establishment of sustainable Transnational open collaboration space with a view to putting the set objectives into practice.

2.3 Objectives

General objectives of TNIS are to:

- Support and manage the creation of truly transnational value chain based open spaces for collaboration for RIS3 implementation in the Energy & Environment sector
- Ensure the sustainability of the project outputs beyond the project.

Specific objectives of TNIS are to:

- Ensure on-going management and coordination of the Energy & Environment sector value chain innovation partnership;
- Organise, support and manage the Energy & Environment sector related:
 - Elaboration of Thematic industrial innovation roadmap;
 - Elaboration of Thematic innovation agenda;
 - Elaboration of thematic transregional exploitation plan;
 - Creation and operation of Transnational open collaboration space.

2.4 Activities

The main activities of the initial phase of building open collaboration spaces for transnational RIS3 implementation of the Energy & Environment sector are:

- Organisation and implementation of **Transnational industrial innovation roadmap workshops**. Each TNIS should organise and implement two online workshops in order to perform a foresight exercise and identify relevant trends. The outcomes of the workshops will serve as content outlines for elaboration of industrial innovation roadmaps.
- Elaboration of **Transnational industrial innovation roadmap (TIIR)**. TIIR will present the possible evolution paths of the considered value chains and innovations over a period of 5-10 years.
- Organisation and implementation of **Industrial innovation workshop**, to collect the relevant inputs for elaboration of transnational industrial innovation roadmap and agenda, including the survey addressing all target sectors in each project region.
- Organisation and implementation of **Transnational innovation agenda workshops**. Building on the innovation roadmaps, two workshops for Energy & Environment network will be organised in order to translate the innovation roadmap into agenda.
- Elaboration of **Thematic industrial innovation agenda (TIIA)**. The outcomes of the transnational innovation agenda workshops will be compiled into industrial innovation agenda, including specific recommendations for actions on regional and transnational level.
- Elaboration of thematic **Transregional exploitation plan (TEP)**. TEP will provide specific information (actors, resources) on the implementation of value chain innovation processes on regional, transnational and cross-sectoral level.
- Creation and operation of **Transnational open collaboration space (TOCS)**. TNIS will be upgraded into a sustainable open space for collaboration. Working principles and commitments will be specified by TNIS.