WP T3: Transnational Strategy for Circular Bioeconomy Governance Structure

DANUBE REGION WHITE PAPER

Input paper for the Transnational Dialogue in Ulm and D.T3.2.4 Brain Trust Roadmap

29th June 2022

This report was produced within the framework of the GoDanuBio project. The report is part of the WP T3: "Transnational Strategy for Circular Bioeconomy Governance Structure". It follows the work done through the project's deliverables "Regional Policy Agendas" and "Regional Ecosystem Mapping". This Report builds on the DANUBE REGION WHITE PAPER, issued in November 2022, and considers the impacts of the Ukraine war on the Region as well as incorporates the most recently updated information on Member States' regional policy agendas, programs, and funding schemes delivered by GoDanuBio partners by the end of May 2022.

The report provides support for the Transnational Dialogue - experience exchange on strategies, regional challenges and joint programs and projects to be discussed at the Ulm Conference's slot entitled "STRATEGY FOR TRANSFORMATION - CIRCULAR BIOECONOMY IN ACTION", on 1st July 2022. Results of the discussion will be included in this report to provide a clear roadmap for the GoDanuBio project in terms of regional policy dialogue and final transnational dialogue.

Executive Summary

The EU Strategy for the Danube Region (EUSDR) was adopted by the European Union in 2011 aimed at developing the economic potential of the Danube region, improving environmental conditions, and enhancing the overall prosperity and quality of life of the population. The circular (bio)economy's major focus, i.e., accelerating the transition from a fossil-based to a bio-based economy, addresses important challenges in the Danube region and plays an important part in the new Danube Transnational Programme (DTP) 2021-2027. Sustainable economic development and environment, energy and climate change are important pillars of the new DTP. Among others, the DTP shall support smart regions/cities solutions as well as advanced technologies regarding circular (bio)economy.

In early 2022, a full-scale war broke out in Ukraine, marking one of the most destructive wars in recent European history. The consequences have been very serious economically, socially and politically. It has triggered large flows of refugees escaping war, disrupted supply chains and caused huge shocks to international commodities markets. Many products sourced from Ukraine have been disrupted or have seen prices surge. Military blockades to Ukraine's port facilities have prevented the export of products, and the conflict has made the air space over Ukraine unsafe for commercial air cargo traffic.

Sanctions have been placed on Russia, with retaliatory moves by Russia to cut off energy supplies or demand payment in Russian rubles. The experience of the pandemic demonstrated in real time the far-reaching impacts sudden emergencies could have on the European economy and social life. The dislocation of almost every aspect of life proved to be a vital testing ground that will serve Europe well in the current crisis. The pandemic demonstrated the need to modernize Europe's value and supply chains, move towards greater sustainability and maintaining cross border solidarity. As the Ukraine war continues, this model will become even more demonstrably important.

The Study "Impacts and Potentials of the Ukraine Crisis on Supply Chains Development for the Danube Region"[1] focuses on bioeconomy value chains and highlights the needs of European buyers to find substitutes for some of their missing and disrupted products. The study shows the existence of demand and supply for products such apples, wood and edible oils in the Danube Region. It points out that food related products are critical for circular bioeconomy. Broken value chains and rising energy prices have pressured firms to create shorter, more resilient, regional and circular value chains powered by renewables. Adapting to the new situation is particularly challenging for SMEs active in agroforestry, agriculture, food, and the wood industry in Danube Region. Due to the war in Ukraine, SMEs from Danube countries have lost not only supply but markets as well.

While the war in Ukraine has exposed Danube countries to new challenges, it has also provided a much-needed spark to move towards the circular bioeconomy model. The case has never been stronger for a more modern shock-resistant, resilient, sustainable model for value chains and partnerships within the Danube Region and across Europe.

The White Paper "Cross-Border Collaboration in the Danube Region with focus on circular bioeconomy – Wishful thinking or a realistic option" was issued in November 2021 to kick-off discussions on how the EUSDR can be better aligned with regional strategies with a dedicated focus on the circular bioeconomy. Since the DTP places significant attention on aligning regional strategies of the partner regions and facilitation of cross-border cooperation, the attention was given to the key question "Do the framework conditions currently exist?"

While the EUSDR is ambitious in terms of sustainability, circular economy and the circular (bio)economy, there is a serious gap between what is planned on the macro-regional level and what is being delivered on the regional level. Only two regions (Baden-Württemberg and Bavaria) have a fully-fledged circular (bio)economy strategy in place, whilst the other Danube regions (and countries) do not have any such strategies and related programs[2]. It is hard to understand how on the macro-regional level circular-(bio)economy can seriously be promoted if the participating regions do not have any strategies of this nature. If the core idea of a macro-regional approach is to facilitate cross-regional cooperation and bundling of critical mass in certain areas, this will struggle to succeed if parts of the macro-regional strategies are disconnected from what the partner regions focus on. This causes a lack of cross-sectoral cooperation possibilities due to missing regional strategies and related programs in the field of the circular (bio)economy. It also leads to a gap between policy makers, civil society, and economic actors. In order to better align regional strategies among the Danube partner regions and the Danube Transnational Programme (DTP) there is a need for several key reforms.

[1] Anteja ECG, Danube Alliance, June 2022

[2] It shall be noted that Germany and Austria do have a national Circular Bioeconomy strategy in place.

More links between regional strategies and the Danube Transnational Programme (DTP) - The primary problem appears to be a lack of regional policies in the DTP. In an ideal case the DTP synthesizes all the different regional policies on the macro-regional level. The issue is that the responsible policy makers or the Ministries responsible for regional strategies (e.g. Smart Specialisation Strategies) are different from those being involved in the development of the DTP. There is also a lack of communication and dialogue between governmental groups. The regional programs and funds for cross-regional cooperation are managed by program owners in various Ministries. If the program owners are not involved in the macro-regional strategy development, the problems will remain.

Incentivize regional program owners to align with macro-regional strategies and cross-border and cross-sectoral cooperation - Cross-regional cooperation, which is always requested within the macro-regional strategies, must be financed from regional programs. However, there are no incentives for program owners to align or synchronize their programs towards cross-regional support schemes. If there is no added value for regional program owners, they would not make any additional efforts. This is especially true since the burdens of the ERDF-Funds are already very high. There is a tendency to over-compartmentalize initiatives which means that there is a lack of joined up action and a lack of impact at a wider level. Whilst individual initiatives are to be welcomed, the tendency to compartmentalize must be integrated instead into a more wide-reaching policy.

Skill development on a policy level on cross-border cooperation that is easier to implement and emulates best practices - There is recent evidence (synchronized call Innovation Express 2021) that existing regional programs can be easily synchronized so that cross-border cooperation is possible without the need to change administrative procedures. Such experiences shall be promoted and made available for a broader policy makers' audience**.** Within the EUSDR, several regions have developed schemes, policies and methodologies which are highly effective. Other regions must take advantage of these by emulating models of best practice as closely as possible where the local conditions permit. Stimulating partnerships among regions and cities with different performance levels would be a good example.

Support the uptake of new technologies and promoting RDI development – There must be supported uptake of technologies related to smart infrastructure and integrating smart cities and regions solutions in the planning, management, and development of the Danube Region cities and regions. The sharing of innovation capacities and the uptake of innovation and advanced technologies must be encouraged. Exchanging experiences and capacity building between innovation actors such as industrial and technology hubs and parks, private enterprises, professional clusters, universities, and RDI centers is also important.

Stimulate vertical and horizontal development – Interventions should focus on sectors that use the highest number of resources and where the potential for circularity and transnationality is highest. Examples include ICT, electronics, batteries and vehicles, packaging, plastics, textiles, construction and buildings, food and nutrients.

Current Situation in the Regions

In February 2022, Russia invaded Ukraine and triggered one of the most destructive wars in recent European history. The United Nations High Commissioner for Refugees records 5.3 million Ukrainians

have fled Ukraine and more than two-thirds of them are currently registered for temporary protection or similar displaced person schemes in Europe[3]. The majority of these refugees are currently in countries neighboring the conflict, with Poland alone accommodating 1.2 millions of these migrants. The figure 1 below shows the countries hosting the highest number of Ukrainian migrants.

Figure 1: Countries hosting the highest number of Ukrainian migrants

Countries neighbouring Ukraine

Country	Data Date	Individual refugees from Ukraine recorded across Europe	Refugees from Ukraine registered for Temporary Protection or similar national protection schemes	Border crossings from Ukraine*	Border crossings to Ukraine**
Russian Federation***	21 June, 2022	1,305,018	Not applicable	1,305,018	Data not available
Poland	21 June, 2022	1,180,677	1,180,677	4,146,144	2,073,052
Republic of Moldova	21 June, 2022	85,797	Not applicable	507,552	138,488
Romania	21 June, 2022	82,733	40,202	691,413	370,707
Slovakia	21 June, 2022	78,972	78,782	525,620	254,316
Hungary	21 June, 2022	25,042	25,042	814,607	Data not available
Belarus	20 June, 2022	9,006	Not applicable	16,660	Data not available
Total		**2,767,245**	**1,324,703**	**8,007,014**	**2,836,563**

****The figure for individual refugees recorded in the country is an estimate as potential further movements or returns cannot be factored for the time being.*

Source: UNHCR

In addition to the human catastrophe, the economy both in Europe and globally has been hit hard. Pre-war Ukraine was a prominent exporter of wheat, and many developing countries relied on Ukraine for a large part of their wheat imports. Ukraine's wheat exports are so significant, that in 2020 Ukraine exported more wheat globally than the entire European Union. The conflict will create many challenges both regionally and globally. In terms of the impact on global commodities, energy and currency markets, the impact is already beginning to be felt. Assuming this conflict continues for a longer time, these shocks could be present for some time to come. Several rounds of peace talks have already failed, and this suggests the conflict may rage longer than had been expected as neither party can find grounds for cease fire. The impact is already being particularly harshly felt in commodities and food prices.

European Union Context

Articles 191 to 193 of the Lisbon Treaty make the protection, preservation, and quality of the environment an obligation of the EU. The EU environment policy operates on the principles of precaution, prevention, and rectifying pollution. The precautionary principle[4] may be invoked when there is scientific uncertainty about potential risks to human health or to the environment emanating from a certain action or policy. If doubts arise concerning the potentially harmful effects of a product, and uncertainty persists following scientific investigation, production and distribution of the product may be halted. These measures must be non-discriminatory and proportionate and must also be reviewed when additional scientific information is available.

The 'polluter pays' principle is implemented by the Environmental Liability Directive[5]. It aims to prevent or remedy environmental damage to protected species and/or natural habitats, water, and soil. Operators of certain occupational activities such as transporting dangerous substances, or activities causing discharge into waters must take preventive measures in case of an imminent threat

[3] https://data.unhcr.org/en/situations/ukraine

[4] https://eur-lex.europa.eu/summary/glossary/precautionary_principle.html

[5] The Environmental Liability Directive 2004/35/EC (ELD

to the environment. If damage has already occurred, they must take appropriate measures to remedy this.

The EU is competent to act in all areas of environment policy, including air and water pollution, waste management and climate change. Its scope for action is limited by the principles of subsidiarity and the requirement for unanimity in the European Council in the fields of fiscal matters, town and country planning, land use, quantitative water resource management, choice of energy sources, and structure of energy supply. The responsibility for this is categorized as a shared competency between the Member States and the EU.

The European Green Deal was proposed in March 2020, and has three primary goals:

1. Zero net emissions by 2050
2. Economic growth decoupled from resource use
3. No person or place left behind

The European Green Deal came about in March 2020, just as the COVID-19 pandemic and associated lockdowns and economic damage were starting to take hold. Around one-third of the €1.8 trillion from the NextGenerationEU Recovery Plan and the EU budget will finance the European Green Deal[6].

The European Union Strategy for the Danube Region (EUSDR)

The EUSDR intends to develop coordinated policies and actions in the area of the river basin, reinforcing the commitments of Europe 2020 strategy towards the smart, sustainable and inclusive growth based on four pillars and twelve priority areas. These shall tackle key issues as mobility, energy, biodiversity, socio-economic development, and safety. In line with the goals of the territorial cooperation objective, the strategy focuses on enhancing closer cooperation within the concerned territory. A key element of the strategy is coordination, by encouraging the increase in the level and quality of network activities, strengthening the existing regional and interregional cooperation but also fostering new cooperation.

The EUSDR addresses a wide range of issues; these are divided among 4 pillars and 12 priority areas. In addition, concrete targets are defined for each priority area. Each priority area is managed by 2 Priority Area Coordinators (PACs). Steering groups advise and assist the work of the PACs. In addition, some priority areas created working groups around sub-themes and tasks. The National Coordinators (NCs) coordinate the participation of their country in the implementation of the EUSDR. The role of the NC is to promote the strategy and inform relevant stakeholders on the national level of key developments[7].

The four pillars of the EUSDR are[8];

1) Connecting the Region
2) Protecting the Environment
3) Building Prosperity
4) Strengthening the Region

[6] https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en
[7] http://www.interreg-danube.eu/about-dtp/eu-strategy-for-the-danube-region
[8] https://danube-region.eu/about/targets/

Circular Bioeconomy in the Danube Regional Context

Austria

Austria's Council of Ministers passed the "Bioeconomy – A Strategy for Austria" in March 2019[9]. This lays out Federal Government goals to decarbonize and encourage sustainability whilst preserving economic growth. Austria hopes to generate 100% of its electricity from renewable sources by 2030 and ranks 3rd highest in terms of renewable electricity generation of all 30 International Energy Agency (IEA) members. Austria has devoted €750 million to decarbonize district and local heating, with a focus on reducing fossil fuel dependency in low-income households by switching them to non-fossil fuel alternatives. Austria has earmarked €260 million to build 1 million roofs with photovoltaic panels and is investing €300 million for research and development into climate action and future technologies.

There is a VAT incentive scheme valued at €100 million for consumers to have appliances repaired rather than discarded, to encourage circularity in the economy. Between 2021-2022, €540 million will be invested into environmentally friendly public transport. For €1095, citizens can purchase universally accepted public transport tickets, valid for one year on all forms of public transport[10].

As a federal state, certain policies are handled at the state (Land, plural, Länder) level and all Länder appear to have at least one policy touching on the thematic areas of the DTP[11]. In the federal state of Upper Austria, for example, the economic and research strategy #upperVISION2030, was commissioned by the Department of Economic Affairs and Research of Upper Austria. In the strategy, there is a field of action called "efficient and sustainable industry and production". In this field, there are some concrete measures that are related to the circular (bio)economy. Upper Austria is a federal state of Austria, so it must be noted that there is no regional circular (bio)economy strategy, but a national one as mentioned above.

Forestry has become a focus of the Austrian authorities as part of their work on the bioeconomy and circular economy. It is under the program title "Think.Wood", which is under the program ownership of the Federal Ministry of Agriculture, Regions and Tourism. The expected volume of this program is a very large sum of €350 million, and is overseen by the funding agency management of Waldfonds. It focuses on wood products innovative solutions with wood from sustainable forest management, as part of the core elements of creating sustainable bioeconomy.

In addition to the forests, the Austrian Government has also placed a focus on the cities as well. This balance is commendable and underlines the importance of the bioeconomy and circular economy in both rural and urban areas. The program title is the "Innovations for Managing Sustainable Urban Accessibility", under the umbrella of the Federal Ministry of Climate Action, Environment, Energy, Mobility, Innovation and Technology and Urban Europe. The aim of the program is to promote the development of innovative solutions for traffic access management in cities and urban regions. The funding agency is the Austrian Research Promotion Agency, and it has a program volume of €750,000.

[9] https://www.bmbwf.gv.at/en/Topics/Research/Research-in-Austria/Strategic-focus-and-advisory-bodies/Strategies/Bioeconomy-Strategy.html

[10] https://platform2020redesign.org/countries/austria/

[11] https://s3platform-legacy.jrc.ec.europa.eu/documents/20182/223684/AT_RIS3_201611_Final.pdf/bbd4d208-e5bf-44c0-972b-b900857d78b3

Bulgaria

Bulgaria is one of the largest beneficiaries of EU funds per capita, which makes it mandatory to invest in climate and environmental initiatives and policies. Bulgaria is also set to be a major beneficiary of the EU's €1.8 trillion budget largely aimed at post COVID-19 recovery. Bulgaria is set to receive up to €10.4 billion from the Recovery and Resilience Fund (RRF). The start of the elections in April 2021 (ended with the Government formation in December 2021) saw all the major parties make strong green pledges, indicating that there is a bipartisan appetite for green issues. The country has a plan for a National Waste Management (2021-2028), as well as a National Action Plan for energy from Forest Biomass Energy (2018-2027).

Bulgaria has a policy in the planning stage named the "Draft Strategy for Transition to the Circular Economy of the Republic of Bulgaria for the period 2021-2027". The strategy is part of the European Commission's package of measures aimed at stimulating the transition to a circular (bio)economy as an engine for global competitiveness and sustainable economic growth. The covered fields are production, consumption, waste management, and the transition from waste to resources. It is drafted by the Ministry of Environment and Water of the Republic of Bulgaria.

To date there are several more national plans and strategies, each of which corresponds at least in particular to the principles of the (bio)circular economy: National Development Program: BULGARIA 2030; The Plan for recovery and resilience of the republic of Bulgaria; Strategy for digitalization of agriculture and rural areas of the Republic of Bulgaria; National strategy for development of the forestry sector; Rural Development Program (RDP) for the periods 2014-2020 and Strategic Plan for Development of Agriculture and Rural Areas 2021-2027; Integrated National Climate and Energy Plan of the Republic of Bulgaria 2021-2030; "National Strategy for Small and Medium Enterprises" 2021-2027 and others.

Croatia

Croatia has two policies related to regional economic development. The first is the Croatian Smart Specialisation Strategy (S3) (2016-2020) of the Government of the Republic of Croatia, which covers food and the circular (bio)economy, which are priority areas of the S3 strategy. A new Smart Specialisation Strategy (S3) for the period up to 2029 is in the preparatory phase and the first series of workshops for development of the strategy was organized in 2021. It will be a key basis for funding research, development and innovation from EU funds in the next financial period from 2021 to 2027. It will ensure that funds are directed to areas with appropriate existing or future absorption capacity of the Croatian economy. This will include the scientific research community, in accordance with the needs of innovation system stakeholders.

The second is the National Development Strategy of the Republic of Croatia until 2030. This policy is in line with other horizontal policies. Special attention will be dedicated to the improvement of vocational education for entrepreneurial occupations in projects co-funded by the European Union funds (ERDF and IPA). These will fund agriculture and aquaculture to strengthen skills related to modern, environmentally sustainable production and aquaculture, including the circular (bio)economy and the use of digital technology.

Croatia has also started the implementation of the National Recovery and Resilience Plan for the period 2021-2026. The measures and activities of the plan will contribute to achieving smart,

sustainable and inclusive growth, with an increase in employment, productivity and economic competitiveness. It also aims to strengthen the economic, social and territorial cohesion of Croatia. In the long run, it will be necessary to focus activities on strengthening the competitiveness and innovation of the economy through the systematic integration of sustainable development, green and digital transition and development based on innovation, new technologies and internationalization of business. The goals of the reforms in the Recovery Plan will be the application of the model of sustainable development, with better water resources management, a more efficient waste management system and the transition to a circular economy.

In accordance with its EU Accession Treaty, Croatia should be fully compliant with the Urban Waste Water Treatment Directive by the end of 2023. The new ordinance on waste management implementing the waste management plan set out the priorities for infrastructure planning, including support for separate collection and composting. It also introduced a waste tax on landfilling. Croatian municipalities will have to meet landfill diversion targets and set up 'pay-as-you throw' schemes.

Croatia supports the EU's decarbonization policy, which further strengthens the national goals of reducing GHG emissions by 45% by 2030, achieving more than 65% of renewable sources and 100% of low-carbon sources in the final production. Croatia also supports developing clean energy and strengthening the circular economy.

Czech Republic

The Czech Bioeconomy Concept in the Czech Republic from the Perspective of the Ministry of Agriculture (2019-2024)[12] is the main governing principle. This has three main aims; 1) steering the bioeconomy concept at the national level 2) making use of international cooperation to boost the bioeconomy of the country 3) reinforce technological developments and innovations. The schemes target rural development, the food industry, innovation and research and economic development. There is also a "Bioeconomy Platform of the Czech Republic" which brings together academic institutions and business associations active in the field of the circular bioeconomy[13]. In 2018, the Czech Republic launched the "Enough with the Plastics" initiative aiming to reduce the use of single-use plastic. A €2.3m subsidy was directed to 23 projects of cities and towns, to prevent over consumption of single use products and replace them with reusable ones[14].

Germany (Baden-Württemberg and Bavaria)

At the federal national level, the "National Bioeconomy Strategy"[15] was adopted in 2020. The Federal Ministry of Food and Agriculture and the Federal Ministry of Education and Research will support innovations and hands-on research projects with their tools and facilities. The conditions to strengthen the bioeconomy will be improved by providing €3.6 million[16]. Another federal policy in this

[12] http://eagri.cz/public/web/file/658143/Leaflet_Bioeconomy_concept_in_the_Czech_Republic.pdf

[13] https://bioeconomy.czu.cz/en/r-14285-members-and-partners

[14] https://unece.org/sites/default/files/2021-04/17%20Czechia.pdf

[15] National Bioeconomy Strategy (2020), Federal Ministry of Education and Research and Federal Ministry of Food and Agriculture; https://www.bmel.de/SharedDocs/Downloads/EN/Publications/national-bioeconomy-strategy.pdf?__blob=publicationFile&v=2, last accessed 14/06/2022

[16] https://www.bmel.de/EN/topics/farming/bioeconomy-renewable-resources/national-bioeconomy-strategy.html, last accessed 14/06/2022

field is the German "Resource Efficiency Strategy"[17]. This sets the goal of decoupling economic growth from resource use. This has the twin goals of reducing environmental burdens and to strengthen the sustainability and competitiveness of the economy. A wide range of support measures is included, e.g., efficiency advice for SMEs, support for environmental management systems, technical standardization processes, stressing resource efficiency in procurement, strengthening voluntary product labelling and certification systems, and enhancing closed cycle management.

Germany is a federal republic, with different Bundesländer (Federal states), each with a degree of autonomy from the German national government in Berlin. At the Länder level, Bavaria has developed its own circular bioeconomy strategy[18]. It aims to foster a sustainable circular bioeconomy encompassing all industrial and commercial sectors that produce, process, and use biogenic resources. It aims to reduce the consumption of fossil resources by implementing a sustainable and viable economic system and developing sustainable, bio-based technologies, processes, and products. It also hopes to use innovation and technology to help catalyze this process. It is ultimately aimed at reducing the consumption of fossil resources by implementing a sustainable and viable economic system and developing sustainable, bio-based technologies, processes, and products.

Baden-Württemberg's "State strategy for a sustainable bioeconomy"[19], adopted at mid-2019, aims to be an example for a sustainable and closed loop-oriented economic system. The increased material and energetic utilization of secondary and residual products from the agricultural and food sector, as well as wood from sustainable domestic silviculture, all offer important potentials. Another core theme is the future-oriented enhancement of existing biogas facilities, as they make for inexpensive interfaces to drive the universal, decentralized conversion of biomass into a multitude of products such as fibers, platform chemicals, food, and energy products. The circular bioeconomy will play an increasingly important role for industry and urban regions. Wastes and wastewater, for example, contain useful resources which can be recovered. In March 2021, elections in Baden-Württemberg delivered a Green/CDU coalition government. This coalition has a strong commitment to green policies. The coalition agreement also called for new photovoltaic projects along motorways and train routes[20].

The position of the bioeconomy and circular economy is the subject of new initiatives. Sustainable bioeconomy as a driver of innovation for the rural areas. The program owner is the Ministry of Food, Rural Affairs and Consumer Protection, with the funding agency/managing authority being VDI/VDE-IT. The funding includes a maximum of €60,000 for feasibility studies. For successful projects, €600.000 with a maximum of €300,000 per partner, is available. The program objectives include a wide range of goals relevant to the bioeconomy and circular economy. These goals include the efficient and sustainable production and provision of regional biomass, consumer-oriented product and process innovations along the food value chain, intelligent raw material and material flow management, new

[17] https://www.bmwk.de/Redaktion/DE/Publikationen/Energie/energieeffiezienzstrategie-2050.pdf?__blob=publicationFile&v=12, last accessed 14/06/2022

[18] https://www.stmwi.bayern.de/fileadmin/user_upload/stmwi/Publikationen/2021/2021-02-15_FutureBioeconomyBavaria_BF_2020_02_15.pdf, last accessed 14/06/2022

[19] https://um.baden-wuerttemberg.de/fileadmin/redaktion/m-um/intern/Dateien/documents/Bioeconomy-strategy-barrierefrei.pdf

[20] https://www.cleanenergywire.org/news/climate-protection-cornestone-govt-coalition-agreement-baden-wurttemberg

materials from wood, lignocellulosic growths and agricultural by-products, and innovative concepts for the further development of biogas plants.

Another new project of note is the project entitled "Bio-Ab-Cycling - Biorefineries for the recovery of raw materials from waste and wastewater". It has a large financial project volume of €19 Million (€7.7 Million from the EU, €11.2 Million from Baden-Württemberg). n a sustainable bioeconomy, wastewater and waste treatment plants become important suppliers of raw materials. The aim is to obtain raw materials for products from waste and wastewater, which are then returned to the economic cycle and put to economic use. The project looks at industrial processes; in sewage treatment plants, for example, platform chemicals such as formic acid, ammonium or hydrogen can be extracted from wastewater. Products can also be obtained from biowaste, such as fibers for use in flowerpots or polyhydroxyalkanoate (PHA), a biodegradable substance used to produce bio-based plastics, or fertilizer and biogas. Beneficiaries will include research institutions (University and non-university research), municipalities, and SMEs

Through the funded projects, processes that already work on a small scale are combined and tested in demonstration and pilot plants in the sense of a refinery. This is an important intermediate stage before the processes are used in municipalities or industry in the next step. One interesting scheme in Baden-Württemberg is aimed at encouraging intergenerational support for the bioeconomy and circular economy. This program is entitled "Funding of projects for the participation of children and young people" and is overseen by the Ministry of Social Affairs, Health, Youth, Family and Senior Citizens. It provides funding for actions in the field of participations of children and young people, development of the digital participation of children and young people, and is open to associations, municipalities, educational institutions. It provides grant funding for between 50-80% of the costs.

Hungary

In 2020, Hungary passed a law committing the country to carbon neutrality by 2050, in line with EU targets on carbon neutrality. The Hungarian Central Bank is one of the most active stakeholders in Central Europe for its green bond market and has issued a €1.5 billion bond, mostly intended to upgrade the railway network. Hungary plans to close the country's last remaining coal power station in 2025, bringing forward the original closure date by five years. It also plans to increase photovoltaic energy within the national grid. This would increase renewable sources by 3%.

A circular economy strategic framework is currently under preparation by the Hungarian Ministry of Innovation and Technology. As a result of the cooperation amongst OECD countries, the European Commission's DG Reform and the Hungarian Government this work started in 2021. It will include a study on the potential of the circular economy in industry, agriculture, and the service sector. There is also a Hungarian Smart Specialization Strategy (S3), in which the agro-food sector and bioeconomy-related sectors are also mentioned in the case of several objectives: advanced technologies in the vehicle and other machine industries. These include agricultural, food processing; agricultural innovation - agricultural knowledge centers, clean and renewable energies - energy produced locally - including the use of bio-energy (including biomass, biogas, bio-refinery methods). It also includes healthy local food - high-quality foods of high added value, healthy diet, functional foods and Hungarian specialties, shortening of food chains, food safety. Finally, there is the 5th National Environmental Programme (2020-2025), currently under preparation. It defines the future development goals of Hungary, considering its capabilities and long-term environmental interest.

Romania

Romania has a pilot bio-economy strategy for the Covasna County located in the Centru Region named "Roadmap for a bioeconomy strategy in Covasna County" https://be-rural.eu/wp-content/uploads/2022/01/EN_OIP-Covasna-_BioRoadmap_with-Annex.pdf elaborated within BE-Rural project "Bio-based strategies and roadmaps for enhanced rural and regional development in the EU". The Roadmap for a Bioeconomy Strategy in Covasna County outlines the actions from cross-sectoral areas, that are then taken forward by cluster organizations and some representatives of the relevant institutions: Clusters representatives / Members of clusters (Green Energy Cluster, Pro Wood, Transylvania Textile &Fashion, AgroFood Covasna), Business Incubator, Civil society NGOs representatives, Education representatives, Local representatives of National Mountain Area Agency, Representatives of National Federation and Local Action Groups, Regional Agriculture Directorate, Covasna Veterinary Sanitary Directorate, Ghelinta Commune.

The bioeconomy development is mentioned in the Smart Specialization Strategy (RIS3) of the Region Centru for the period 2021-2027 that addresses 5 cross-sectoral themes, including the theme of sustainable economy, with the following three subdivisions: a) collaborative economy, b) circular economy, c) local value chains. In addition, references to the bioeconomy are made in the Regional Development Plan of the Region Centru 2021 – 2027. This cross-sectoral regional trend is in line with national efforts, in which several government institutions are getting involved, such as the Government Department of Sustainable Development, Ministry of Agriculture, Ministry of Environment and Ministry of Economy. Regionally speaking, the Smart Specialization Strategies of South Muntenia, North East and Central Development Region 2021-2027 have the (bio)economy as one of their core topics.

Romania has the policy "National Strategic Plan on Common Agricultural Policy in Romania" (2021-2027). This plan points out that there is a need to finance integrated projects, regardless of the size of enterprises in the agricultural sector, forestry, and food industry. The circular (bio)economy is considered to be a central driver for the sustainable development of rural areas, in correlation with the development of farms which are acting in an organized producing system. Besides, the "Strategy for agri-food development in the medium and long term-Horizon 2020-2030" looks for an enhanced rural development.

Romania has sought World Bank assistance in hitting its climate goals. Romania plans to reduce GHG (Greenhouse gas) emissions by 40% based on 1990 levels and achieve a 27% increase in energy efficiency [1]. This will be challenging given that Romania is simultaneously attempting to raise the standard of living of its rural poor, particularly in terms of their access to electricity. Romania instituted the "Rabla" initiative, which pays 6,500 Lei to individuals who buy a less polluting car and exchange a more polluting one in the process. To build on this, the "Rabla Plus" offers a payment of 45,000 Lei for the purchase of electric or hybrid vehicles, and unlike the "Rabla" programme, is not conditional upon exchanging an older vehicle. Since 2019, the Government has encouraged the installation of photovoltaic panels on houses. The plan aims to provide electricity to consumers, with any surplus generated being put back into the national energy grid [2].

Romania has placed a particular emphasis on support for farmers, with a special focus on small farms and farms run by younger farmers. This could be a means to alleviate high levels of rural poverty and also to stem the large outward flow of young Romanians to higher wage economies in Western

Europe. In this sense a well-executed bioeconomy and circular economy would be environmentally good sense, and would also mitigate the loss of working-aged persons from the Romanian economy, so makes good economic sense as well. The definition of a farm run by a young farmer is a young farmer settles who with other young farmers and exercises effective long-term control over decisions concerning the management, benefits and financial risks of the holding in question. In addition to support for farmers, Romania allows support for SMEs up to four years following their registration, operating within green industry innovation, blue growth or ICT.

Clustering is also a strategy that Romania appears to be embracing more. One example of this would be the "Operational Program Competitiveness 2014-2020 POC / 975/1/1 - Projects for Innovation Clusters 2021 - LDR (without Bucharest - Ilfov)". Clusters are referred to both as a concept and a real economic phenomenon of a geographical concentration of cluster actors. Clusters generally have a sectoral orientation. They are defined as groups of enterprises and related economic actors and institutions are located in close proximity to each other. The Ministry of European Investments and Projects (MIPE) oversees this cluster initiative, with a volume of €24,838,699 of available financial support. In terms of eligibility for cluster support, the legal definition is clear. The organization of the cluster will contain at least 10 independent parties organized as trading companies (SMEs according to Law 346/2004) and at least one independent type research organization (university or institute CD)

Serbia

Serbia is not an EU Member State, although it has been a candidate country since 2013. Serbia has the policy "Agriculture and Rural Development Strategy of the Republic of Serbia" and has a Circular Economy Roadmap in place. A Roadmap for Circular Economy in Serbia is a process intended to get to know, promote and put together the recognized stakeholders able to contribute their knowledge, innovation and creativity to a faster transition to circular economy[21]. The roadmap is guidance for a transition to a model of circular economy focusing not just on profit, but on the protection of the environment and the preservation of resources. The economic, social and ecological dimensions are viewed as equally valuable.

The objectives of the strategy are: 1) Production growth and income stability for the producers; 2) market-driven competitiveness growth of the agricultural sector; 3) Sustainable resource Smart Specialization Platform (EC) 2021 Project co-funded by the European Union Funds (ERDF and IPA) 9 (2014-2024), Ministry of Agriculture and Environment Protection management and environmental protection; 4) Improving the quality of life in rural areas and reducing poverty; 5) Efficient management of public policies and improvement of institutional framework for agricultural and rural development. Although the circular (bio)economy is not mentioned, the 3rd and 4th objectives are indirectly related with it.

Serbia has received support for its green policies from the World Bank's Public Sector Efficiency and Green Recovery Development Policy Loan. This will provide €82.6 million to solidify its green reform agenda and quicken Serbia's recovery from the COVID-19 pandemic. This will be buttressed by support from Agence Française de Développement.

[21] https://www.rs.undp.org/content/serbia/en/home/library/mdg/roadmap-for-circular-economy-in-serbia.html

The Ministry of Ecology has the overall responsibility for the circular and bioeconomy schemes in Serbia. Under its challenge call "Challenge Call for Innovative Circular Economy Project Proposals". There are calls for projects which promote more efficient use of resources and reduction and reuse of waste in production processes, and establish industrial symbiosis by applying the principles of the circular economy. A wide range of actors and entities are eligible for funding, ranging from cities and municipalities, public utility companies, private business, and NGOs. The exact details of funding are co-financing as seed money, in the form of Low-value Performance-Based Payments Agreements (PBPA) and/or guarantee schemes for commercial loans and other borrowing for green investment. Serbia also has an initiative entitled "The Circular Economy Accelerator". This scheme is aimed at private businesses, NGOs, cities and municipalities, and public utility companies. Its goal is to help projects reach a level of maturity necessary to mobilize funds for their implementation.

Serbia is also aiming to make its industrial policy more circular, sustainable and bioeconomy orientated through a range of schemes. A program volume of €130,000 is available for industry with the goal of the promotion of circular economy and private sector education on the topic of circular economy, according to different types of recycled raw materials and the more efficient use of resources. An even more well-funded initiative is being overseen by the Ministry of Economy, entitled "Renewal of the industrial equipment". With a funding volume of €13 million, the scope is the manufacturing industry with additional criteria on the use of recycled resources. It hopes to encourage investment in more energy efficient solutions and solutions that use recycled resources.

Slovakia

The Slovak Ministry of Agriculture and Rural Development has responsibility for the development and implementation of agriculture, food, forestry, wood processing, hunting and aquaculture policy. Some of its main focuses in the area of the circular (bio)economy include sustainable land management, effective utilization of biomass from soil, plant, forest and animal production, added value of agricultural and food production and waste management[22].

The Ministry has two research institutions – the National Agricultural and Food Centre (NPPC) and the National Forest Centre (NLC). Their activities cover agricultural, food and forestry research, innovation and knowledge transfer. They are engaged in comprehensive research on the sustainable use and protection of natural resources in plant and animal production, food production, soil management, grassland and mountain agriculture, agroecology and agro-food economy. They also perform a research and advisory service oriented towards sustainable forest management and its implementation in practice.

Slovakia also has a "Bioeconomy Cluster" which aims to promote cooperation, networking, innovation and mutual exchange of information between cluster members and other stakeholders in the agri-food and bio-based sectors[23]. These are primarily representatives of the business sector, representatives of research, development and education, representatives of regional and local governments and civil society. Slovakia has a policy "Greener Slovakia – Strategy of the Environmental Policy of the Slovak Republic" until 2030, drafted by the Ministry of Environment of the Slovak Republic. Objectives of the strategy are to achieve a better quality of the environment and also a sustainable and circular economy, based on consistent protection of the environmental components

[22] https://bioeast.eu/slovak-republic-ministry-of-agriculture-and-rural-development-of-the-slovak-republic/#
[23] https://bioeconomy.sk/en/

and using the least possible non-renewable natural resources. The strategy contains the section "Green Economy" that deals with the topics of the circular economy, waste management and energy.

In the October 2021-June 2022 period, Slovakia had a number of well-funded initiatives in line with the bioeconomy and circular economy. Slovakia has €2.7 billion set aside under its "Recovery and resilience plan - Green economy area" overseen by the Ministry of the Environment. Amongst the thematic areas targeted by this scheme are renewable energy sources and energy infrastructure, sustainable transport, building renovation, decarbonization of industry, and adaptation to climate change. Slovakia has schemes specifically aimed at waste reduction and reuse. There is the programmatic goal of "preparation for re-use and recovery with a focus on the recycling of non-hazardous waste, including support for separate waste collection systems and support for the prevention of biodegradable waste". It aims to promote the sustainable use of natural resources through the development of environmental infrastructure. It also aims to increasing the rate of waste recovery with a focus on preparing it for reuse and recycling, and promoting waste prevention

Since the last review, Slovakia have made tremendous progress. They now have a fully-fledged circular bioeconomy strategy in the planning phase. This marks an encouraging improvement from the situation just a few months ago

Slovenia

Slovenia has ambitious and wide-ranging green goals in line with the country's National Adaptation Strategy of 2016. Slovenia has a Roadmap Towards a Circular Economy. This outlines the strategy for a circular (bio)economy on three dimensions in the "Circular Triangle". Firstly, Circular Economy (business models), secondly, Circular Change (government policies) and finally, Circular Culture (amongst citizens[24]). Several pieces of legislation and strategies govern the goals of Slovenia's circular bioeconomy. Topics from the field of circular bioeconomy are addressed in the Resolution on Strategic Guidelines for the Development of the Slovenian Agriculture and Food Industry by 2020 – "Ensuring the Food for Tomorrow" (2011). The strategy on implementing the resolution (2014), is outlined in the Slovenian Framework Programme for the Transition to a Green Economy (2015). Further details and goals are outlined in the Slovenian Development Strategy 2030 (2017), in the Slovenian Strategy on Smart Specialisation (2017) and in the Roadmap towards a Circular Economy in Slovenia (2018)[25]

Slovenia aims to reach net-zero GHG emissions and the transition to renewable energy use by 2050. The construction sector will be modernized with new buildings using 20% less energy, a 70% decrease in GHG emissions from the sector, and two-thirds of energy used in buildings to be from renewable energy sources by 2030[26]. In the second half of 2021, Slovenia held the rotating presidency of the EU Council. It aimed to use this to promote digitalization and the electric smart grid.

Slovenia has a policy of the Development Strategy of Slovenia 2030 by the Government of the Republic of Slovenia (2017). The need to facilitate transition to a circular economy is mentioned in this strategy, but the term "bioeconomy" is not explicitly defined. The strategy is in line with the 17 Sustainable

[24]https://circulareconomy.europa.eu/platform/sites/default/files/roadmap_towards_the_circular_economy_in_slovenia.pdf

[25] https://bioeast.eu/slovenia-ministry-of-agriculture-forestry-and-food-of-slovenia/

[26] https://platform2020redesign.org/countries/slovenia/

Development Goals (SDGs), in particular Slovenia´s development goals related to the circular (bio)economy.

Smart specialisation strategy - S4, being recognized as a starting point for focusing investments in areas where Slovenia has the knowledge and capacity and also the innovation potential for positioning in global markets, is combined in the framework of nine strategic development partnerships, with some of them directly addressing bioeconomy matters:

- Strategic Research and Innovation Partnership (SRIP) – Circular economy- introduced an entirely new model of development and innovation cooperation between the key stakeholders – the model of thematic SRIPs. SRIP – Circular Economy is connecting Slovenian business subjects, educational and research institutions (RDI), non-governmental organizations and other interested parties in collaboration with the state, aiming to establish new value chains according to the economic principles of closed material flows. Its ongoing activities are led by ŠGZ (Chamber of Commerce and Industry of Štajerska), which connects mainly research and industry to provide high-quality products based on the reuse of waste, providing alternatives to fossil fuel, or incorporating the strategy for the treatment of products after their lifecycle – making easy to recycle products with the producer having a waste return strategy. The concept is transferable to any national/regional environment trying to set up thematically connected networks based on the quadruple helix approach, connecting actors dedicated to the circular economy, regardless of their organizational form or core activity.
- Another bio-economy related partnership in Slovenia is SRIP HRANA (Engl. Food) - strategic innovation and development partnership for priority area S4 Sustainable food production, managed by the Chamber of Agricultural and Food Enterprises. It is evolving into a dynamic community of farms, companies, associations, R&D institutions, investors and other stakeholders whose focus is on the targeted intensification of research and development activities for the industry. The SRIP HRANA is a central national hub for networking and collaboration between ambitious and development-oriented stakeholders in agriculture, food and related fields. The key objectives of each focus area are: Introducing circular economy principles for sustainable use of resources in agri-food, strategic and efficient supply chain management, more efficient agricultural and food production, and development of new innovative products and services to ensure the safety and quality of finished products, setting up a sensory centre (virtual, physical) for the efficient development of new functional foods tailored to the needs of specific target population groups.

Since the last review, Slovenia has dedicated European Regional Development Funds (ERDF) to support various aspects of the bioeconomy and circular economy. The expected volume of this program is €672.5 billion, demonstrating just how committed the ERDF is to support this goal. The Slovenian Government will use these funds to support a wide range of activities and interventions across a broad spectrum of circular and bioeconomy thematic goals and programs. These thematic goals include, but are not limited to, decarbonization, green and digital transition, support for micro and small companies, innovation and research, circular economy innovation, agricultural circular economy, and climate neutrality. In addition to this, the Slovenian Government has clear goals on what it hopes these interventions will achieve. These include goals such as raising

productivity and competitiveness, exporting higher added value products and services, strengthening value chains, funding for innovative companies in the seed development stage encouraging the start-up of innovative technology companies with growth potential. These goals elegantly combine sustainable development with an economic climate that is good for the economy.

Good Practice

Baden-Württemberg Bioeconomy Strategy

In 2019, Baden-Württemberg unveiled an ambitious and comprehensive state strategy for bioeconomy and sustainable development[27]. The strategy has identified four key objectives to target:

1) To use innovative biological concepts to identify renewable or recyclable raw material sources. This aims to reduce the use of fossil resources and permanently minimize dependence on energy and raw material imports
2) To achieve a reduction in greenhouse gas emissions in Baden-Württemberg to protect natural resources and contribute to conserving regional biodiversity.
3) Baden-Württemberg will turn into a role model for the transformation towards sustainable economic organization based on a circular economy.
4) To strengthen rural areas in Baden-Württemberg by increasing regional added value based on innovative bioeconomy solutions and the creation of attractive, future oriented jobs.

Interestingly the "State Strategy for a Sustainable Bioeconomy" does not aim to replace any individual technical policies. Instead, it aims to support cross-sectoral cooperation and the interdisciplinary involvement of social actors. Biological resources are to be integrated within value-added chains for industrial and energy products. Opportunities are to be created to utilize organic waste and wastewater as raw material sources with bio-based methods and biological processes. Also, it plans to exploit non-renewable, abiotic raw materials efficiently and affordably and to recover these from industrial, consumer and energy products. This should result in a raw material transformation of "closing the loop", so that as many raw materials as possible are fed back into circular economies and with as much value as possible at a high cascade level (without downcycling) in consideration of environmental and economic criteria. The state has identified five conditions to achieve this;

1) Economy, science, and society must act as a single system, creating new links between value-added chains and returning other products and materials into the circular economy at the end of their life cycles while retaining as much value as possible.
2) New value-added chains and networks across all economic sectors must be developed with new production and logistics processes and products.
3) Material flows between rural, urban, and industrial areas must be optimized to achieve a greater degree of inclusion for raw materials and foods into the circular economy.
4) Qualified jobs must be created to utilize regional biological resources.

[27] https://um.baden-wuerttemberg.de/fileadmin/redaktion/m-um/intern/Dateien/documents/Bioeconomy-strategy-barrierefrei.pdf

5) Legal obstacles to the bioeconomy system must be identified and assessed in terms of the extent to which adjustments to existing laws are possible.

This strategy is comprehensive, detailed and enjoys strong political support. It focuses on a wide range of areas and seeks to leverage cultural, economic, social, and political action to support the strategy as a whole.

Gap Between the EUSDR and regional/national circular (bio)economy strategies

There is currently a gap between what is needed, what is planned and what is actually happening. The Danube regions must take concrete actions to address the circular (bio)economy as well as environmental protection and address the damage done by the COVID-19 pandemic. The EUSDR/DTP represents an excellent opportunity to address all these but must be adapted to reality. Strategies of the partner regions of Danube must be addressed more urgently than currently appears to be the case. There appears to be a sharp divide in the field of circular (bio)economy policies and programs between the EUSDR approach and the regions. If this divide is not taken away, any strategy developed under the DTP will not and cannot be implemented in practice. There is no possibility to meet some of the objectives of the DTP, especially to initiate cross-border collaboration in the field of circular (bio)economy, since there are insufficient regional policies and programs that can finance this cross-border collaboration. Only a small number of Danube regions have a circular (bio)economy strategy/policy in place.

One good way to close the gap between the EUSDR and regional/national circular (bio)economy strategies is to examine good practices in the fields of regional cooperation, policies, budgets, and innovations. The new DTP defines several pillars with a close relationship to the low-carbon economy, including circular (bio)economy (e. g. Sustainable Economy Development or Environment, Energy and Climate Change)[28]. However, this strategic approach is undermined by the regions of the Danube region that mostly do not have this topic properly considered in their strategies.

[28] Danube Transnational Programme, 2021 - 2027

Table 1: Regions/Countries with a circular (bio)economy strategy or similar policies in place[29]

Country/Region	Circular (bio)economy strategy/policy currently in place	Circular (bio)economy strategy/policy currently in planning stages	No Circular (bio)economy strategy/policy but topic-related policies
Baden-Württemberg (DE)	✓		
Bavaria (DE)	✓		
Bosnia			✓
Bulgaria		✓	
Burgenland (AT)			✓
Carinthia (AT)			✓
Croatia		✓	
Czech Republic		✓	
Hungary		✓	
Lower Austria (AT)			✓
Moldova			✓
Montenegro			✓
Romania			✓
Salzburg (AT)			✓
Serbia		✓	
Slovakia		✓	
Slovenia		✓	
Styria (AT)			✓
Tyrol (AT)			✓
Ukraine			✓
Upper Austria (AT)			✓
Vienna (AT)			✓

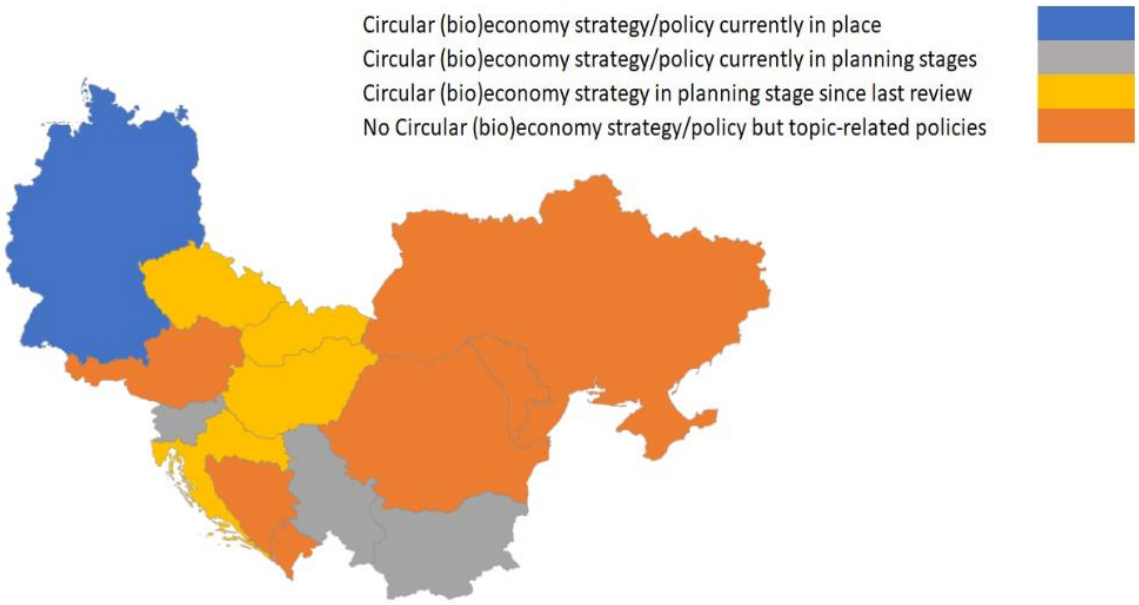
Since the last time this issue was reviewed, four Member States (Croatia, Czech Republic, Hungary and Slovakia) have made tremendous progress. They all now have circular bioeconomy strategies in the planning phase. This marks an encouraging improvement from the situation just a few months ago. This is a testament to the individuals and organizations in those states who have driven this agenda

[29] Austria has a national bioeconomy strategy since 2019 (as described on page 5) but for the purpose of this paper only regional strategies have been considered in countries organized politically in federal states e.g., Austria and Germany.

with great energy and enthusiasm. It is also an encouraging sign that suggests Member States are following the lead of other states and serving as an inspirational template to emulate.

These developments have increased the number of Member States with a circular bioeconomy strategy in the planning stages from three to seven. This creates two goals to be hit as soon as is feasible. Firstly, Member States which have yet to plan a circular bioeconomy policy must aim to emulate those which now have. Secondly, states which are now in the planning stage must seek to emulate the states with fully operational circular bioeconomy strategies in place by implementing their own. The Member States and relevant actors within them must continue to offer support to each other in this regard.

Figure 2: Regions/Countries with a circular (bio)economy strategy or similar policies in place



Recommendations

There is currently a mismatch between the EUSDR and the reality on the ground at Member State level with regards to circular (bio)economy strategic approaches. There is the risk of the ambitious EUSDR failing to hit its targets and stimulate cross-border cooperation among the Danube region in the field of circular (bio)economy. This would have an obvious impact on both the economic life of the region and the efforts of the region to achieve environmental targets. This can be avoided through careful and determined alignment of policy actions on the regional and EUSDR levels. Political support for green policies, the circular (bio)economy, economic development, and cross-border cooperation remains high at both the regional and macro-regional level. This means that all challenges will enjoy strong political support, which will be critical given the scope and scale of the program goals. Whatever other challenges may be present, one can draw encouragement from the high-level support that exists.

That said there is clearly a need for change and for action.

More Links Between government and society

The primary problem appears to be a lack of policies planned at governmental level being actualized and delivered at the ground level. This could be indicative of a lack of communication and dialogue between government, civil society, and the wider population. There is clearly a communication bridge and other forums where representatives can meet and work together. The European Strategy for the Alpine Region (EUSALP) strategy provides an interesting template[30] whereby this could be bridged and may be something that the EUSDR could emulate. There is a lack of regional policies in the DTP. In an ideal case the DTP could synthesize all the different regional policies on the macro-regional level. The issue is that those policy makers or Ministries responsible for regional strategies (e. g. Smart Specialisation Strategies) are different from those being involved in the development of the DTP. There is also a lack of communication and dialogue between governmental groups. If these program owners are not involved in the macro-regional strategy development, the problems will remain.

Maintain Policies that Work

There is no need to replace any individual technical policies. Whilst it would be preferable to integrate them into a wider whole, one must avoid jettisoning a policy that contributes to wider change simply because it is not (currently) part of a wide-ranging strategy. One example of an individual policy that is not part of a wider whole, but which is still useful is Romania's "Rabla" and "Rabla Plus" schemes for replacing polluting cars.

Foster Cross-Sectoral and Cross Border Cooperation

There is a tendency to over-compartmentalize initiatives with a lack of joined up action and a lack of impact at a wider level. Whilst individual initiatives are to be welcomed, the tendency to compartmentalize must be integrated instead into a more wide-reaching policy. This should cross different economic sectors, and a good example to emulate would be the strategy employed by the Baden-Württemberg Bioeconomy Strategy. Exchange experiences and capacity building between innovation actors such as industrial and technology hubs and parks, private enterprises, professional clusters, universities, and RDI centers should be fostered. The cross-border aspects of the strategy help foster greater solidarity between Member States. It also acts to more deeply integrate supply and value chains and serve as a mechanism for exchanging best practices. Other Interreg programs have shown that the cross-border cooperation aspects are a key feature to cultivate rather than have successful schemes confined to national borders. There is recent evidence that existing regional programs can be easily synchronized so that cross-border cooperation is possible without the need to change administrative procedures. Such experiences shall be promoted and made available for a broader policy making audience.

Share and Emulate Best Practices and Stimulate Vertical and Horizontal Development

The policies that work in one region are not being shared with others, despite the obvious potential congruency. Whilst individual policies that are effective are to be commended, they must be shared with partner regions that are struggling. Every region has at least one scheme, policy or model of action that could be emulated and applied by at least some of the other partner regions. Within the strategy, several regions have developed schemes, policies and methodologies which are highly effective. Other regions must take advantage of these by emulating models of best practice as closely as possible where the local conditions permit. Stimulating partnerships among regions and cities with

[30] https://www.alpine-region.eu/alpine-region-network

different performance levels would be a good example. Interventions should focus on sectors that use the most resources and where the potential for circularity and transnationality is highest. Examples include ICT, electronics, batteries and vehicles, packaging, plastics, textiles, construction and buildings, food, and nutrients.

Conclusion

Europe's efforts to promote interregional and cross-border cooperation, and to promote more sustainable economic practices were undermined by the COVID-19 pandemic. Border closures, forced business lockdowns, travel bans, and cancelations of events became a bitter reality of life for European citizens. The pandemic exposed more than ever the vital role that a more integrated circular (bio)economy could play in lessening "shocks" in the future, as well as creating a more robust and integrated economic ecosystem that will be economically, ecologically and socially successful and sustainable in "normal" times as well. This has proven vital in light of the outbreak of conflict in Ukraine in early 2022. The experiences gained from COVID-19 proved to be a vital training ground for how the region reacts to shocks, and whatever the ultimate stressors and impacts are, the region's leaders and actors will be far better equipped to react than in previous years.

The conflict in Ukraine has been destructive in terms of human life, refugee displacement, economic shocks and disruptions to supply and value chains. The war shows little sign of halting soon, and peace talks have achieved little. This means that the conflict-related economic and social challenges to Europe, and the Danube Region in particular, will continue for some time. The Danube Region, given is geographic proximity to Ukraine and economic relationship with this country, will be disproportionately challenged. This hammers home the importance of links between Danube Region countries and the importance of GoDanuBio.

The bioeconomy and circular economy are clearly vital for Europe, both at the economic level and the ecological level. It is encouraging to see countries/regions increasingly moving in this direction, however slowly the case may be in some regions. There are signs that some "late comers" to this are starting to catch up. The circular bioeconomy presents a golden opportunity to reduce waste, revive declining regions and make better use of biological resources. It will help to revive these regions economically and ecologically and is a strong compliment to the circular (bio)economy goals of the Member States and regions. Sustainability is critical given Europe's commitment to a greener and more environmentally stable future. Perhaps the key ingredient is the skill and commitment of the people of the Danube Region, and their involvement will be critical to the success of the circular bioeconomy and sustainability. They can be guided by governments at the European, national and local level, as well as by educational institutions, professional associations, clusters and civil society.

The Danube macro-region remains committed to a future that is more environmentally friendly, less polluting, and more circular in nature. Political will and popular support for this remains high. Despite the challenges, there is room for optimism. Europe will be greener, more digital, more resilient and better prepared for the current and forthcoming challenges.