

Domain 5 - Healthy food and environment

POWER4BIO cross-visit in Slovakia

September 2020



MINISTRY
OF AGRICULTURE
AND RURAL DEVELOPMENT
OF THE SLOVAK REPUBLIC

Domain coordinators:

Stanislav Hronček – stanislav.hroncek@land.gov.sk

Jozef Turok – jozef.turok@land.gov.sk

Domain visionaries:

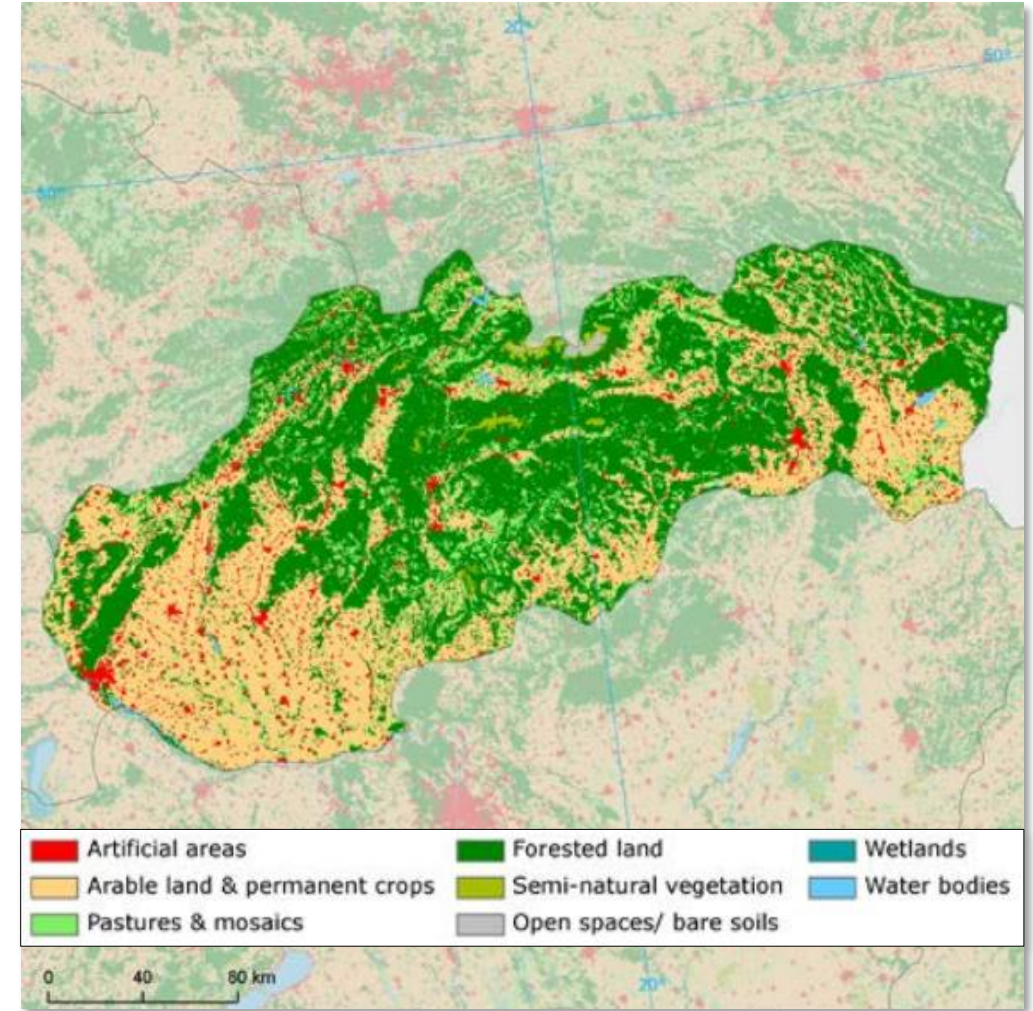
Dana Peškovičová – dana.peskovicova@nppc.sk

Slávka Tóthová – slavka.tothova@nlcsk.org

Rationale behind the domain

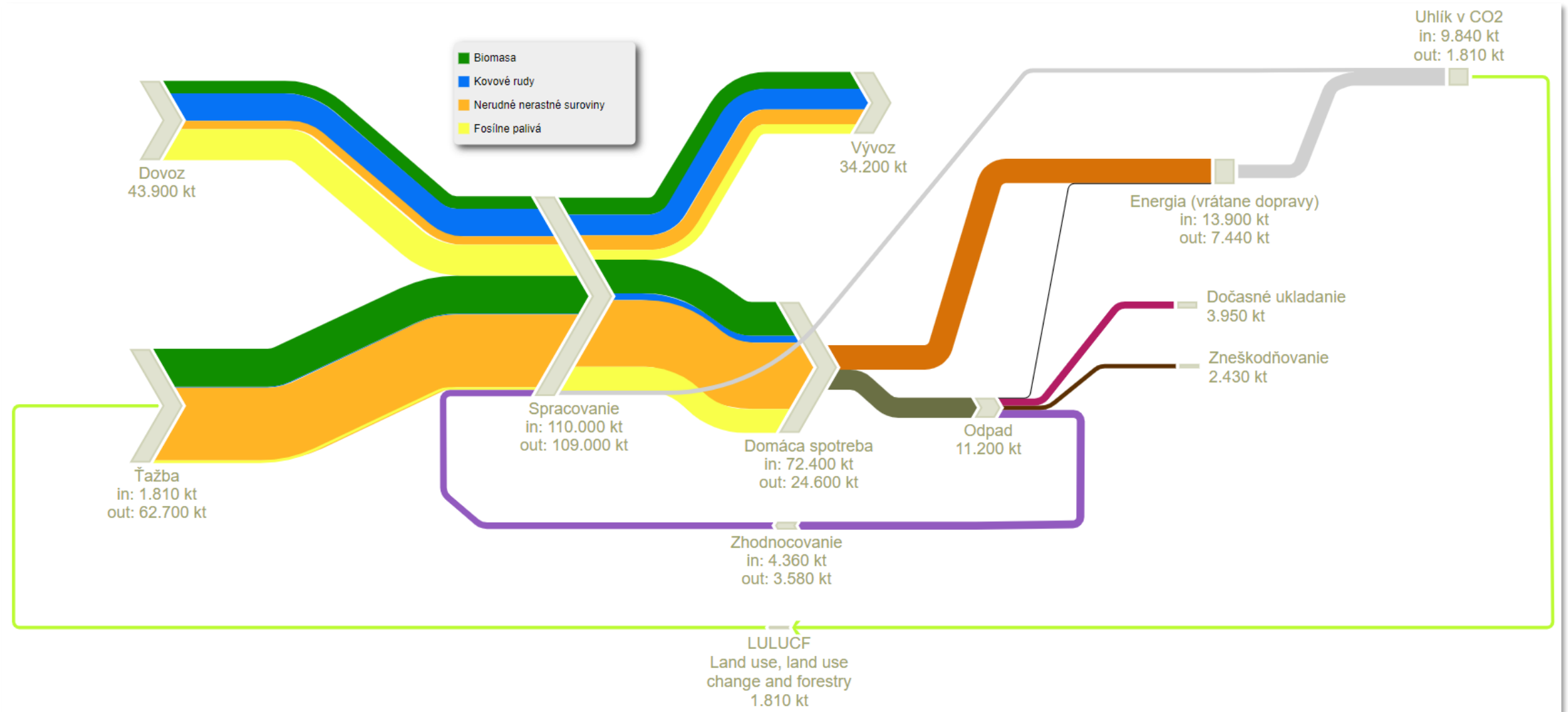
Selection of the domain is focused on three areas:

1. **biomass** - approximately one third of all materials extracted or produced in Slovakia are biomass
2. **land** - agriculture, forestry and water management manage more than 80% of the land area of Slovakia
3. **food, water, air, ecosystems** - agriculture, forestry and water are crucial for the food we eat, the water we drink and the air we breathe, healthy ecosystems are vital to human health because they provide us with basic goods and services, including food, carbon sequestration, regulation of natural risks or recreation



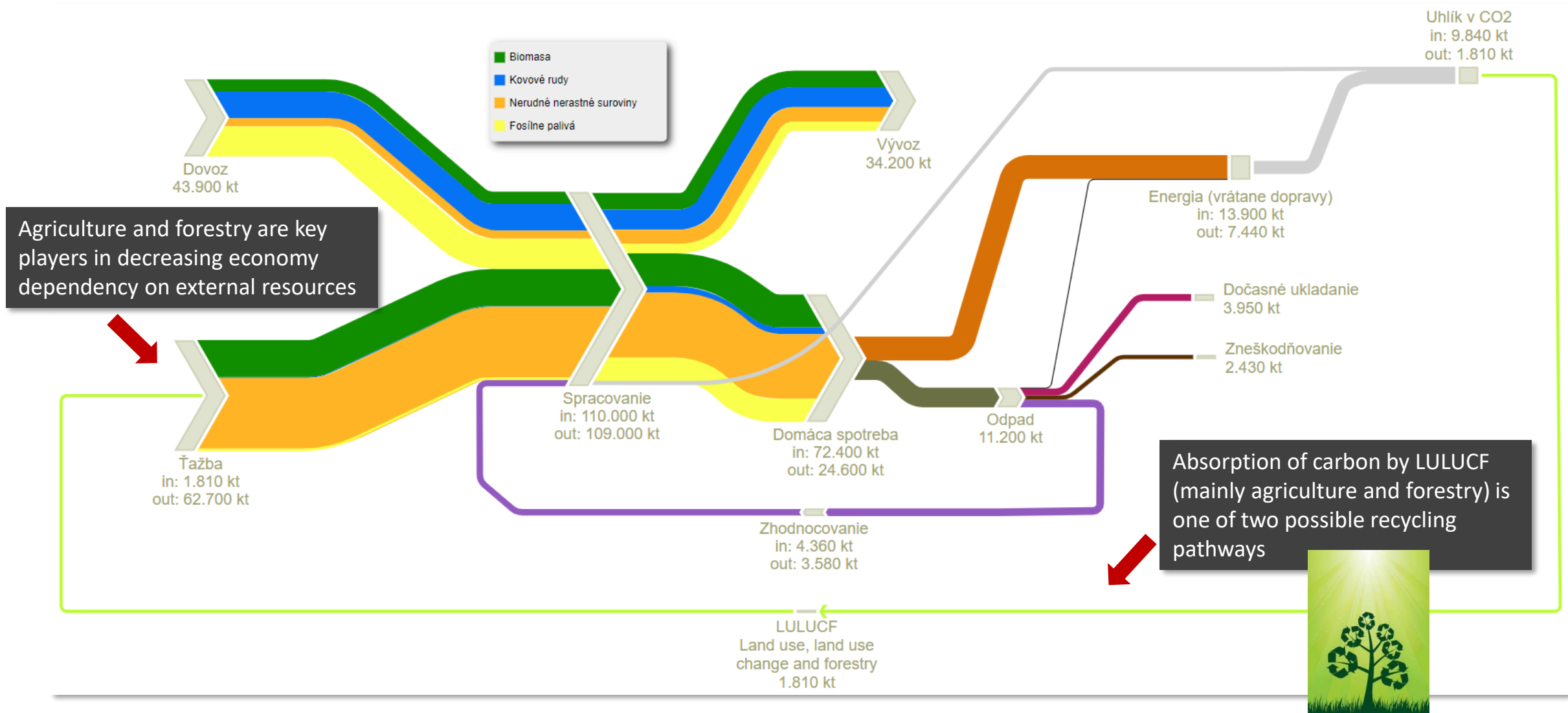
Domain 5 coordinator

Domain 5 in the context of economy



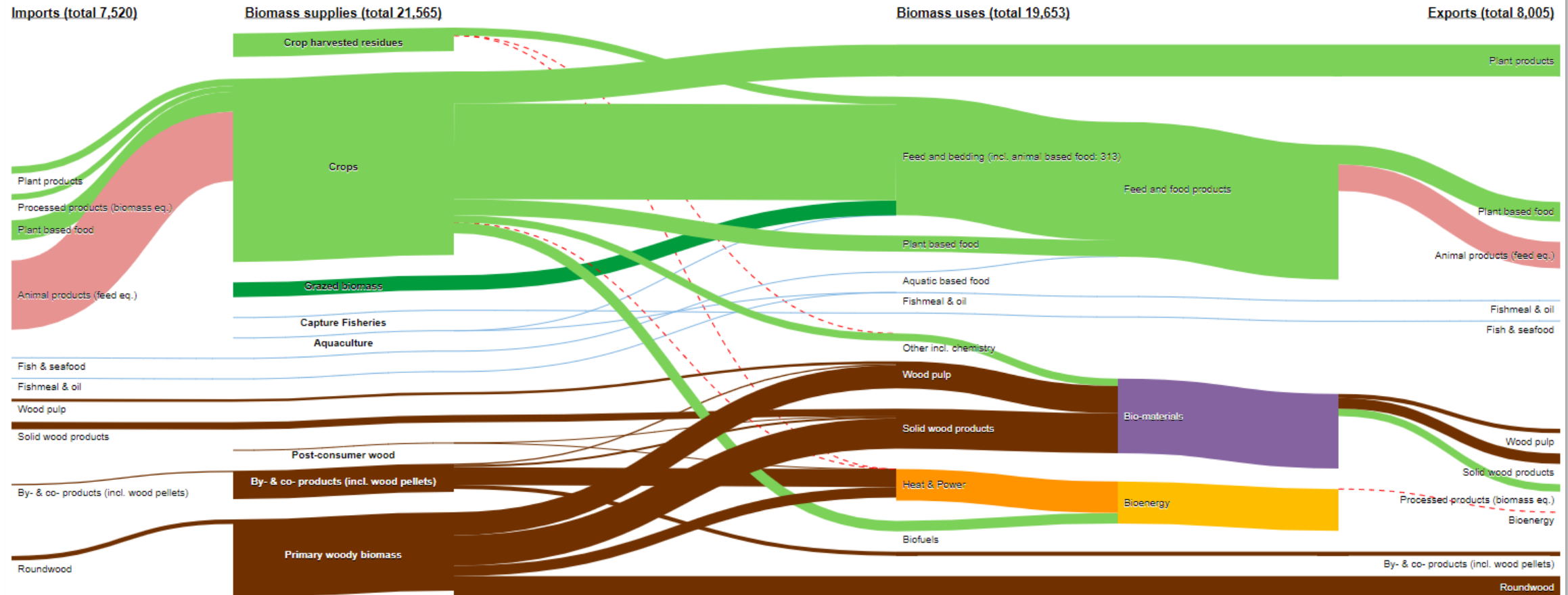
Domain 5 coordinator

Domain 5 in the context of economy



Domain 5 in the context of economy

Biomass balances in Slovakia, Last data available
1000 T of dry matter



Source: data from the BIOMASS project, European Commission – Joint Research Center

Please note: Supply and use figures might not match due to estimation errors, stock changes, waste and/or loss of biomass or differences in the data sources used.

Known data gaps are shown as dotted red lines. Gaps derive from missing or incorrectly reported data, data not assigned to a specific category or data that cannot be estimated.

Domain 5 coordinator

Domain 5 in the context of economy

Biomass balances in Slovakia, Last data available
1000 T of dry matter

Imports (total 7,520)

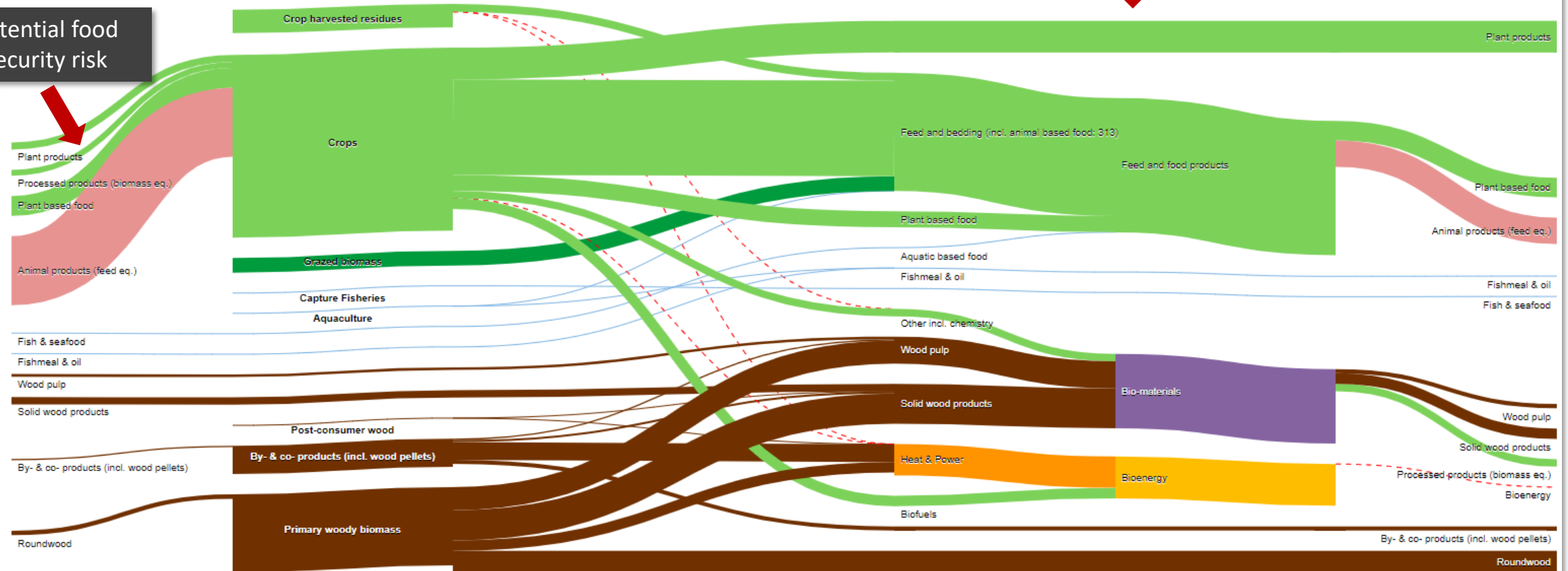
Biomass supplies (total 21,565)

Biomass uses (total 19,653)

Exports (total 8,005)

Potential food
security risk

Very low added value



Source: data from the BIOMASS project, European Commission – Joint Research Center

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Very low added value

Research infrastructures

- Science parks and centers linked to Domain 5 are also linked to at least one another domain
- Issues with funding of R&I capacities within previously financed R&I infrastructures
- Excellence centres

Park/centre	Links to Domain				
	Vehicles for the 21 st century	Industry for the 21 st century	Digital Slovakia and the creative industry	Public health and health technology	Healthy food and the environment
CAMBO TRNAVA	x	x	x		x
UVP BA	x	x	x	x	x
ALLEGRO	x	x			
CAV	x	x			
PROMATECH	x	x		x	x
UVP TECHNICOM	x	x	x	x	x
VC ŽU	x	x			
UVP UNIZA	x	x	x		
AgroBioTech				x	x
BTL SAV				x	
BIOMED				x	
VP UK				x	
MEDIPARK			x	x	
BioMed Martin				x	

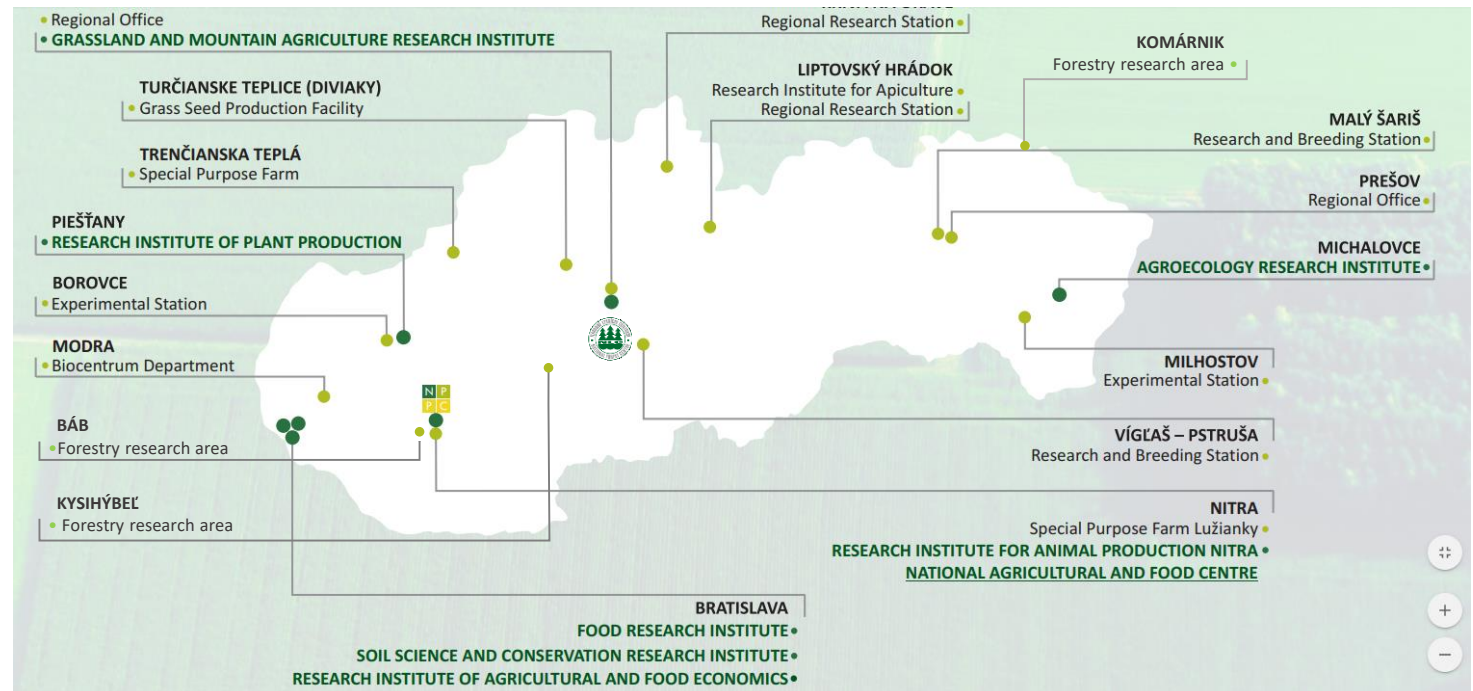
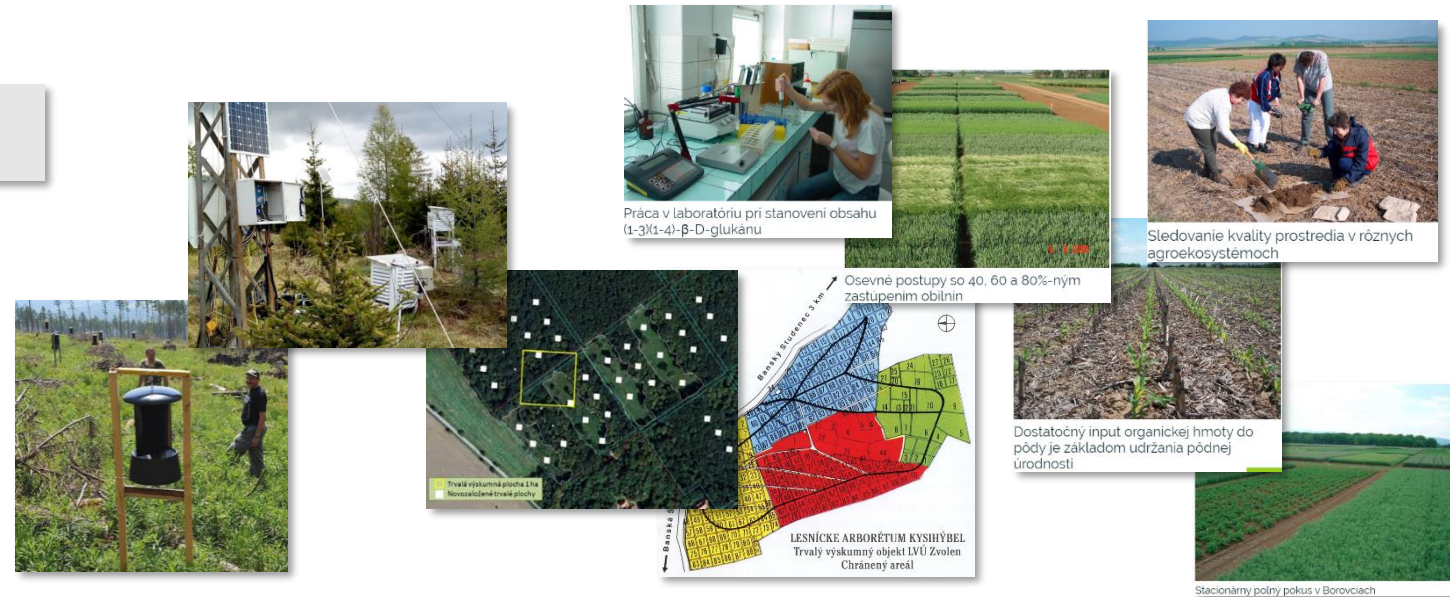
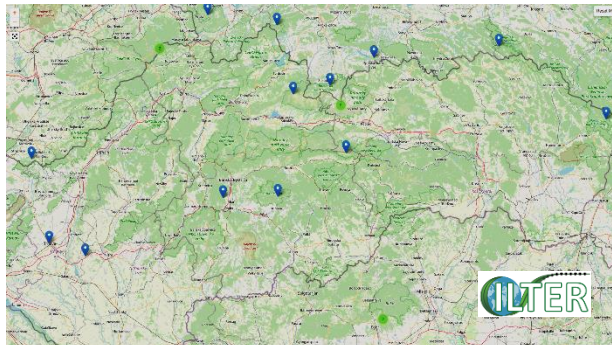
Research infrastructures

Long-term running research!

Forest – 40 years
Forest – 60 years
Breeding – 30 years
Soil – 25 years

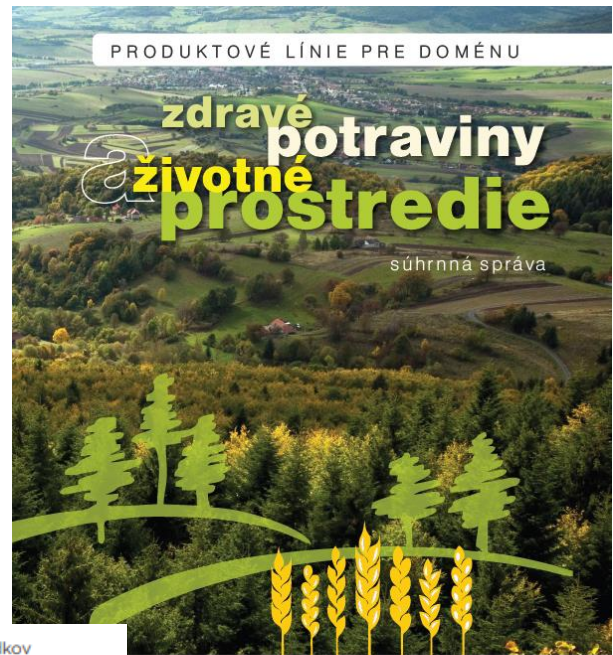
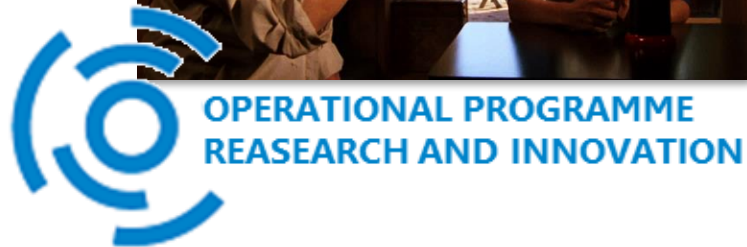


- Existing research infrastructures are spatially distributed due to the need for variety of geographical conditions
- Whole range of topics is covered

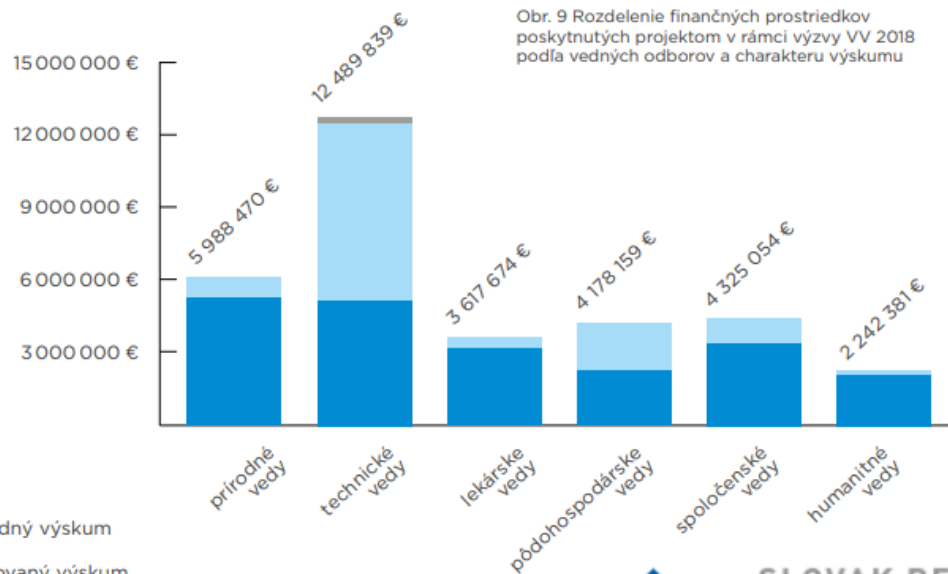





Funding

- Issues with implementation of the OP R&I causing funding gaps
- Funding via national budget or H2020



Vypracovalo Ministerstvo pôdohospodárstva a rozvoja vidieka SR v spolupráci s Úradom podpredsedu vlády SR pre investície a informatizáciu a členmi pracovnej skupiny domovskej platformy.



 základný výskum
 aplikovaný výskum
 vývoj



**SLOVAK RESEARCH
AND DEVELOPMENT
AGENCY**

Cooperation

- **National level:**
 - Vertical – relatively good among different actors WITHIN specific domains
 - Horizontal – issues in cooperation BETWEEN specific domains (AGRI – FORESTRY – ENVIRO)
- **International level:**
 - Very low between CEE countries compared to connections to WE countries
 - “Islands” of international cooperation often based on effort of motivated individuals
 - Very low portion of foreign researchers hosted by domestic R&I organizations

Calls for Operational Groups (OG) (informal state of play Sept 2018)



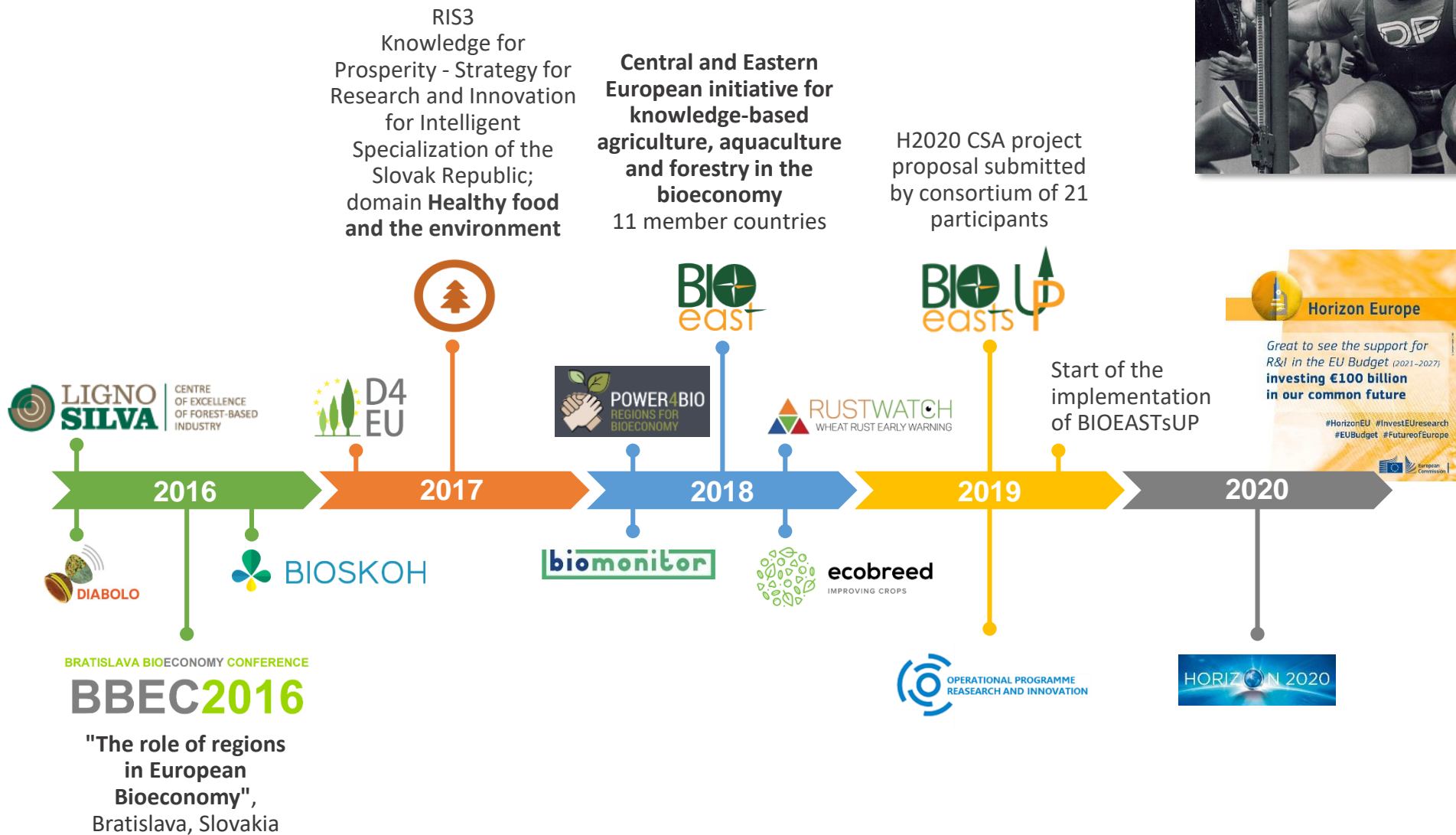
- 1st call for OG projects to open soon
- ★ 1st call for OG projects now open
- ★ OG projects finished, selected and/or being evaluated

funded by  European Commission

One of very few countries without Operational Groups. The call should be launched this year.



Examples of Bioeconomy related H2020 projects



R&D ranking of Slovakia

R&D landscape - Slovakia

Country

Country Group

Innovation Performance [↗](#) Moderate Innovator

Innovation performance of the country according to the European Innovation Scoreboard 2019

R&I Intensity [↗](#)

0,9%^{2,1%}
EU average

Total intramural R&D expenditure (GERD) as percentage of GDP

R&I Intensity Ranking [↗](#)

21^{out of 28}
among EU

Total intramural R&D expenditure (GERD) as percentage of GDP

Private R&I Intensity [↗](#)

0,5%^{0,4%}
Public

Intramural R&D expenditure (GERD) as percentage of GDP between Private (Business Enterprise) and Public

DESI [↗](#)

9,71^{21 out of 28}
among EU

The Digital Economy and Society Overall Index is a composite index on country digital performance

Ease of Doing Business Rank [↗](#)

42^{out of 190}

World Bank index ranking the country on the ease of doing business

Researchers ratio [↗](#)

2.797^{21 out of 28}
among EU

Number and ranking of a country based on the number of researchers per million of population

Patent applications rate [↗](#)

1,1^{3,3}
EU average

Patent applications per billion GDP in current Purchasing Power Standards (PPS in EUR)

Top cited publications rate [↗](#)

5,7%^{11,1%}
EU average

Percentage of scientific publications within the 10% most cited scientific publications worldwide

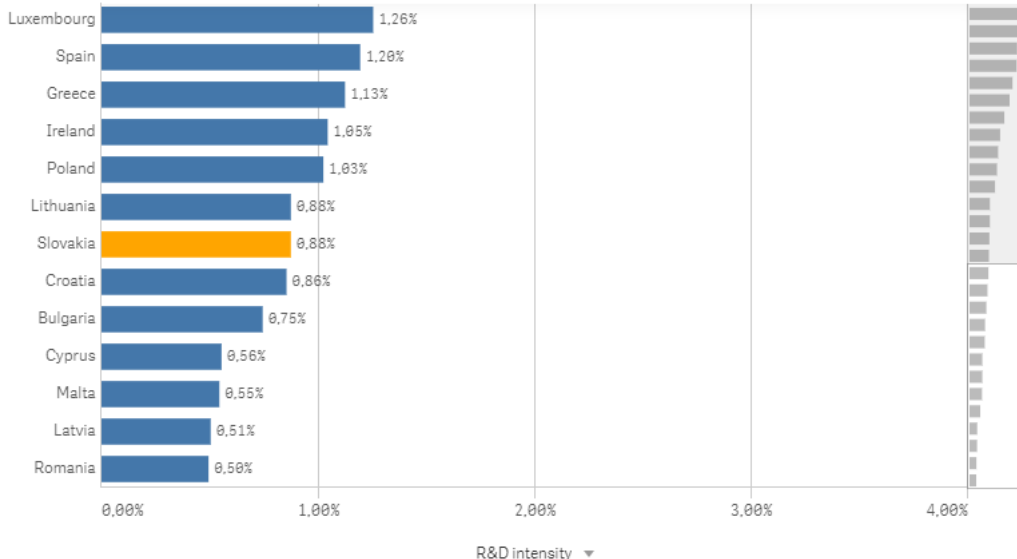
Knowledge-intensive employe...

31,4%^{36,1%}
EU average

Percentage of employment in Knowledge Intensive activities

R&D indicators by country

Country

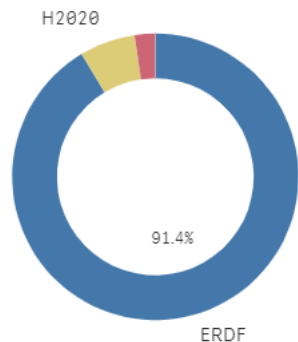


EU contribution to R&I [↗](#)

1,81B^{1,69B}
ERDF and EAFRD

H2020 contribution to R&I in EUR and contribution from European Structural and Investment funds (ERDF)

EU Contribution to R&I (EUR)



The filters are available only for country level.

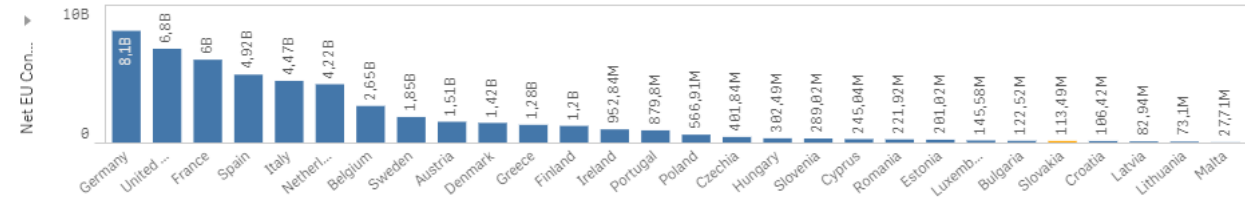
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H2020

Participation in Programmes - Slovakia

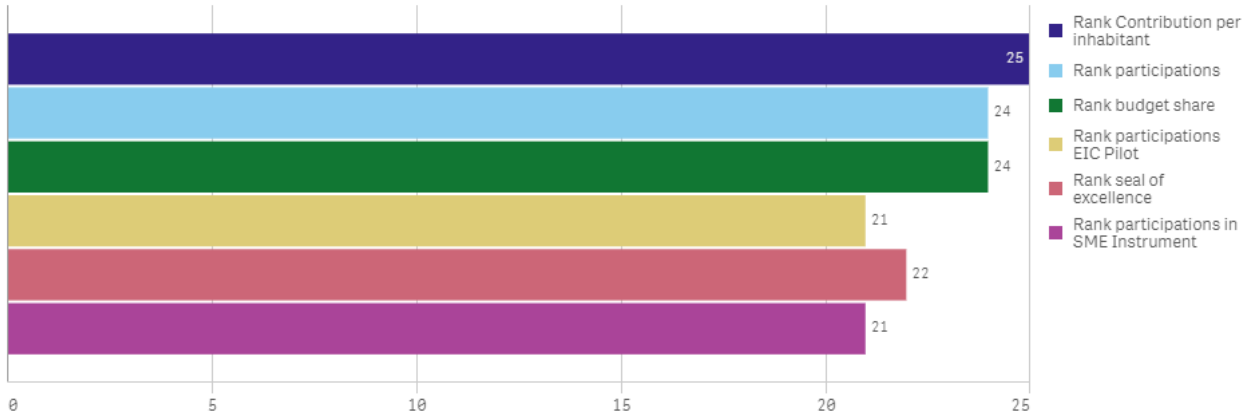
Country	Country Group
<div> <div> Budget share rank ↗ 24 out of 28^{EU} </div> <div> Participation rank ↗ 24 out of 28^{EU} </div> </div>	
Ranking position based on funding received from H2020, for a country in its country group	
Ranking position based on the participations in H2020, for a country in its country group	

Horizon 2020 Contribution (EUR) to Member States



Ranking of Slovakia in Horizon 2020

compared to Member States

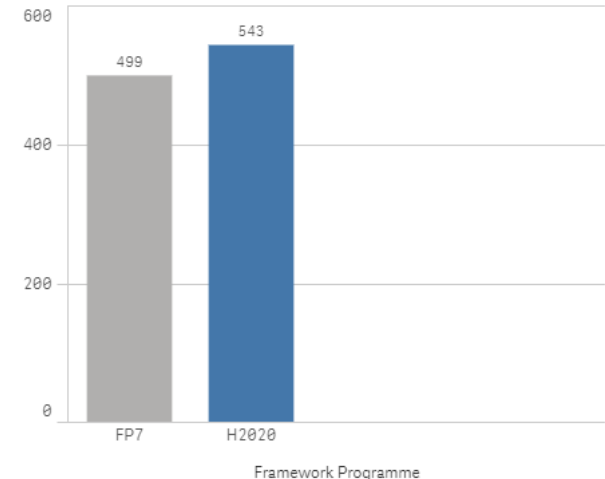


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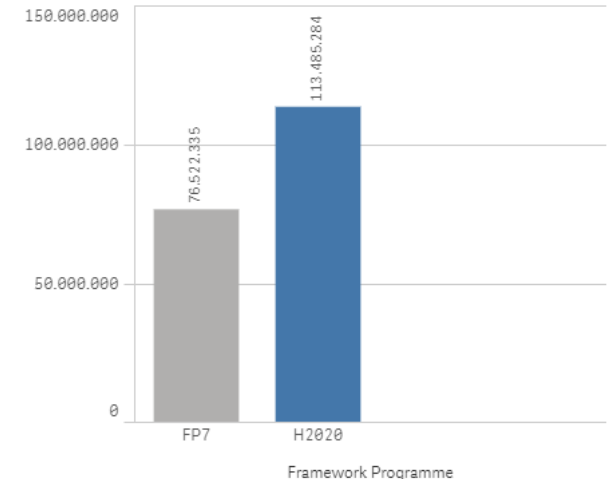
Net EU Contribution (EUR) by thematic priority



Participation across Programmes

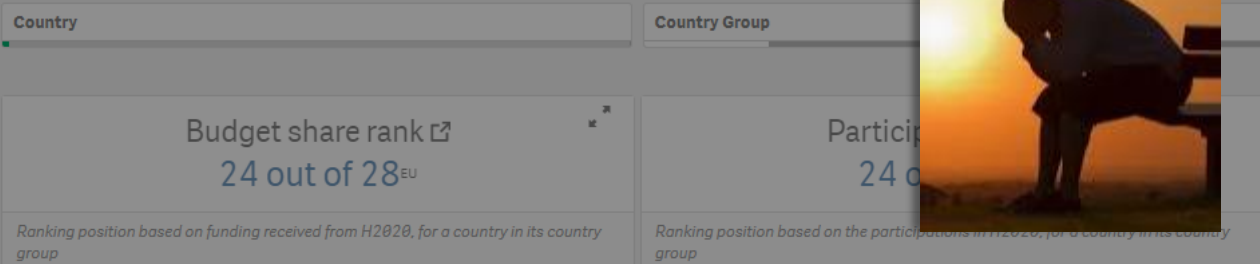


EU Contribution (EUR) across Programmes



H2020

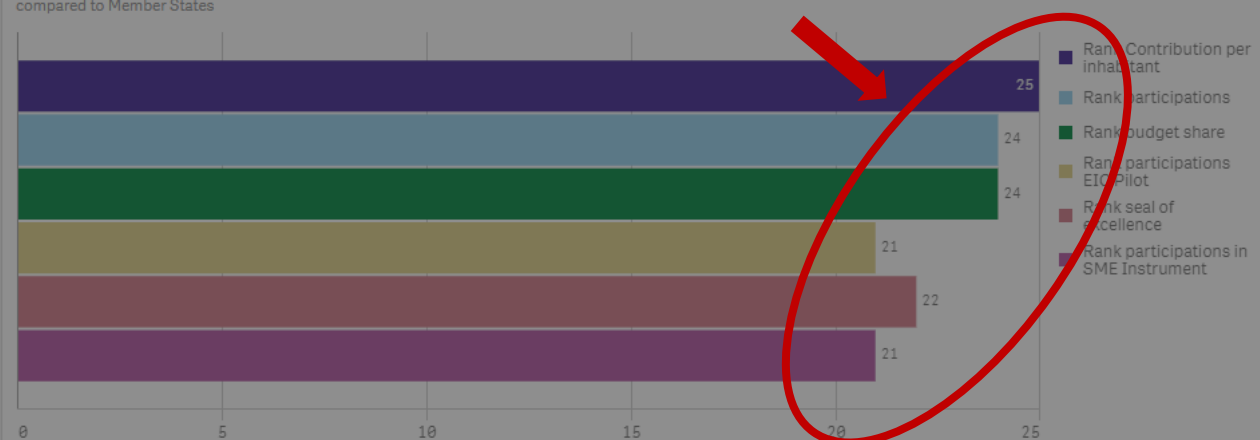
Participation in Programmes - Slovakia



Horizon 2020 Contribution (EUR) to Member States



Ranking of Slovakia in Horizon 2020 compared to Member States



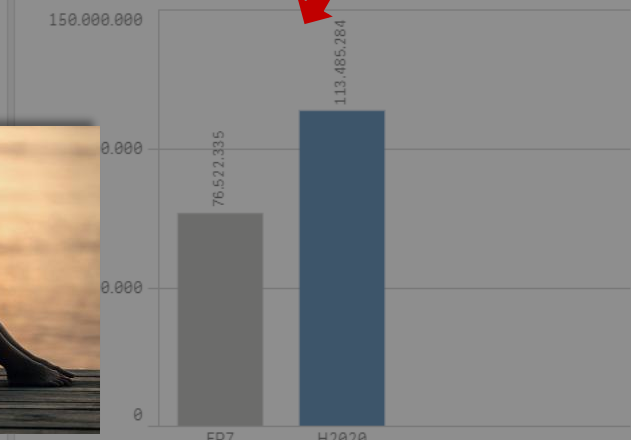
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Participation across Programmes

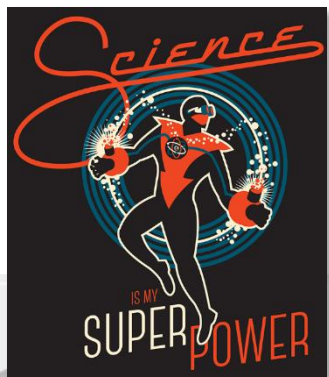
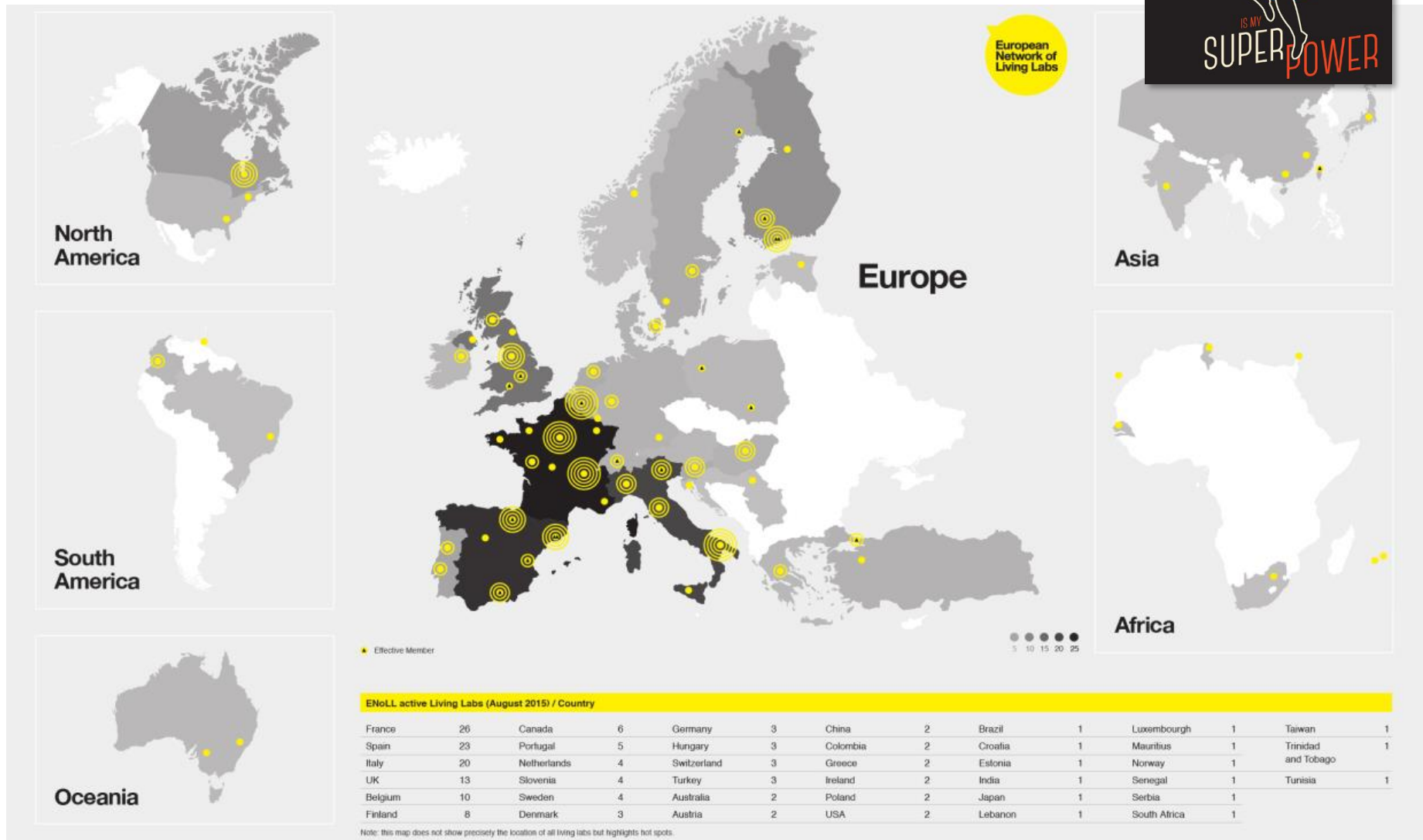


EU Contribution (EUR) across Programmes



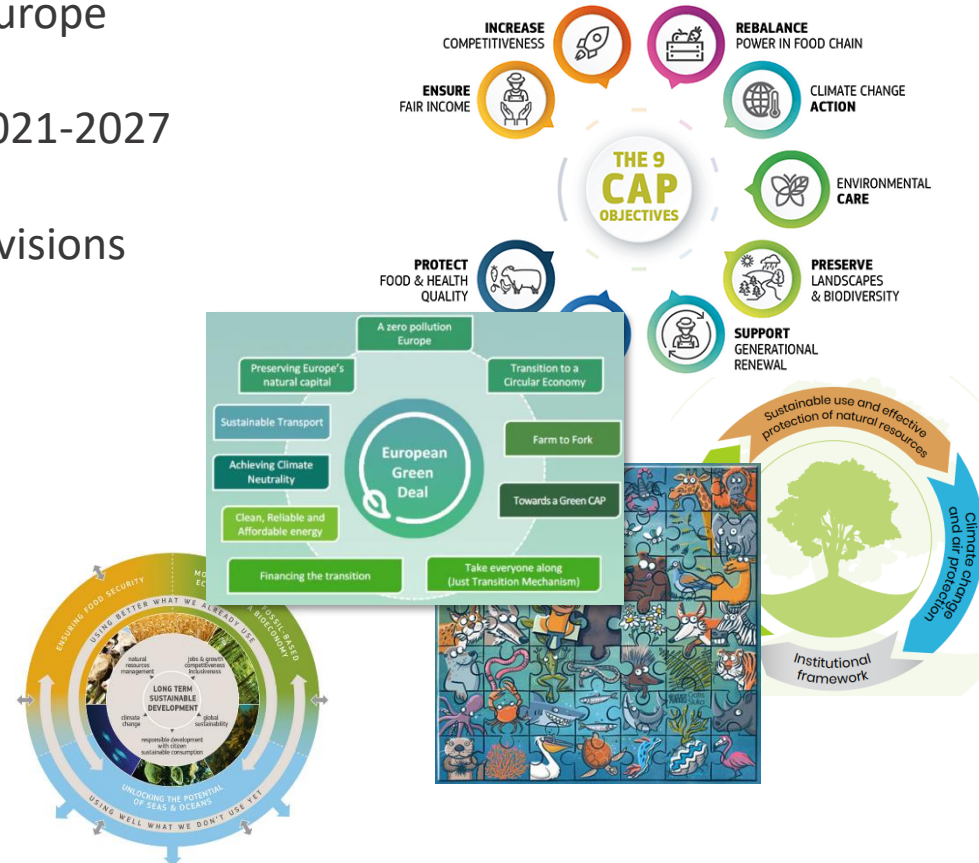
Research infrastructures – Living Labs

- **Great potential for broader inclusion of primary producers in R&I activities**
- Need for local R&I due to urgent demand for long term sustainability
- Innovation risk mitigation – facilitating innovation transfer
- Supporting high-skilled local employment



Future perspectives

- Increase participation in Horizon Europe
- Build synergies of RIS3 with Horizon Europe
- Build synergies of RIS3 with CAP for 2021-2027
- Align RIS3 with major EU policies and visions
 - Green Deal
 - Farm to Fork
 - Biodiversity strategy
 - Bioeconomy strategy
 - Envirostrategy 2030 (SK)
 - ...



Get more funding and added value (access to high quality R&I)

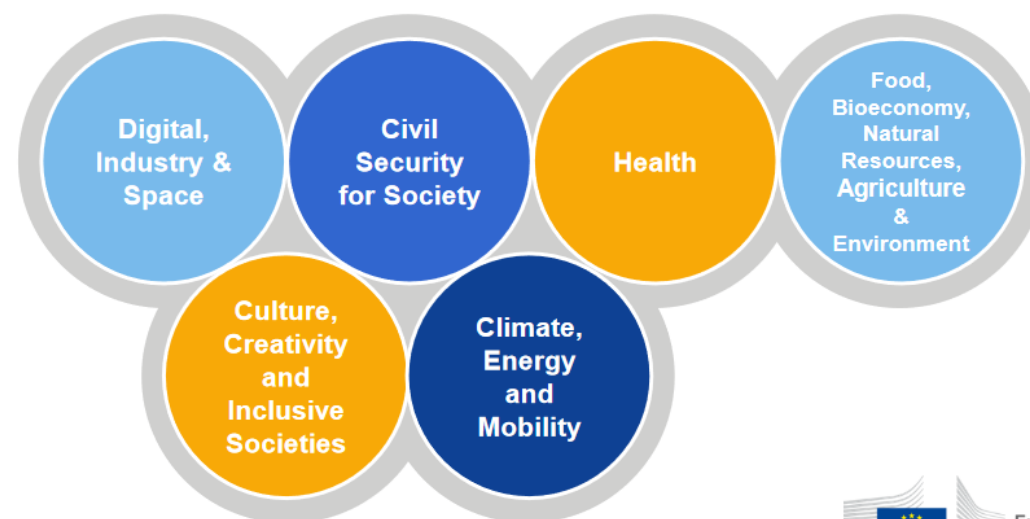
Domain 5 coordinator

Domain vision 2021-2027 Healthy food and environment

- What we want to achieve in 7 years with the „correct“ implementation of the domain
- **BIOMASS = main source of economic use and protection/preservation for the domain !**



The validity and importance of the domain was also confirmed by the Covid-19 epidemic



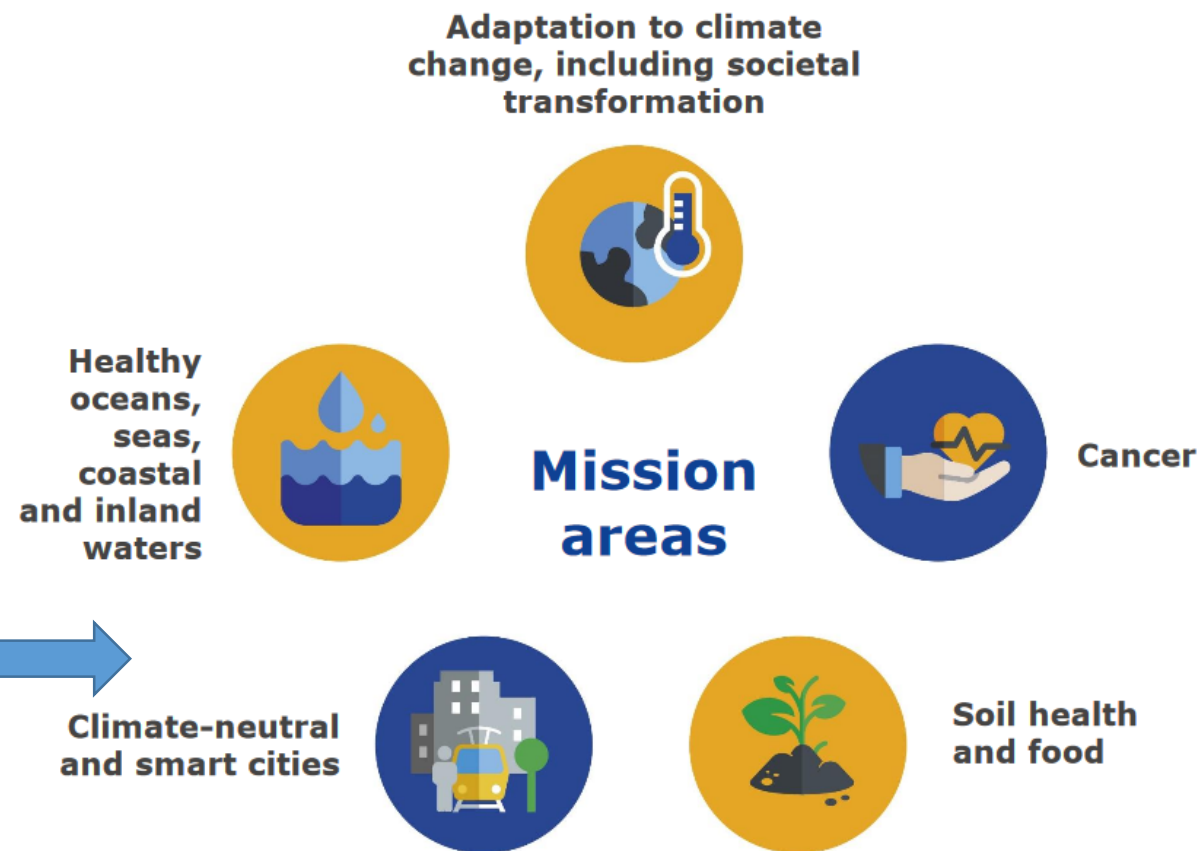
Refined description with targeted transforamntional goals/objectives that will be achieved by implementation of RIS3

Domain transformational goal categories

3 main partially overlapping targeted goals, that will reflect on going transformation in the fields of domain:

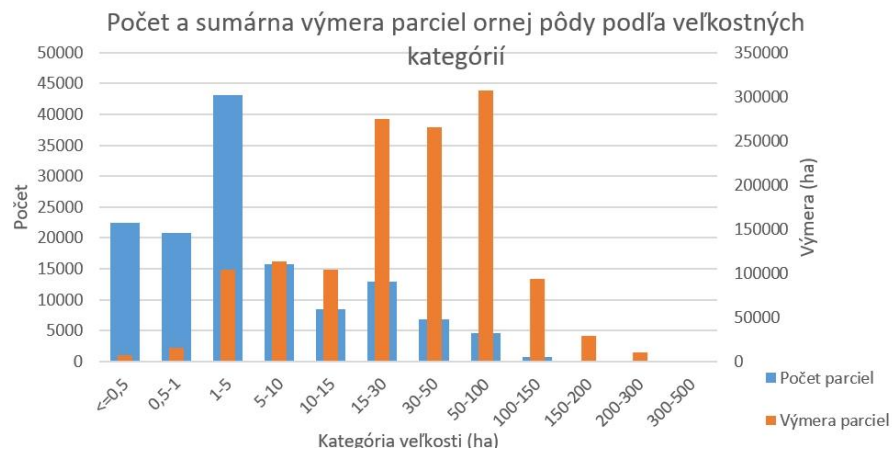
- **Economic goals**
- **Socio – economic and environmental goals** (and regional development)
- **Health** (people and environment) and **quality of life**

Tight domain linkage to the HE Mission areas



Economic goals

- **Increase added value of agro/food/forestry in the primary production and production chain, fair profit sharing (from primary producer to retailer)**
- **Improve innovation capacity** - measured by innovation indicators (OECD, EUROSTAT, JRC, other relevant)
- **Better implementation of innovations** - new innovative food and nonfood products, waste valorization, circular economy and bioeconomy
- **Applied new technologies and methods** – replace missing labour forces, lower the production costs, help to improve environmental aspects (digital solution to minimize chemicals/ pollution, precise technologies,.....)
- **Raising skills and knowledge** - generate new jobs with advanced skills, with potential to generate innovative solutions, generation replacement in the sector



Challenges for different structured agrofood sector in SK

- Large farms have absorption capacity for innovations
- Underestimated small farmers/enterprisers needs investment and skilled innovative people in regions
- Living labs is a chance....
- Chance for linked industry

Socio economic and environmental goals

Key elements/keywords

- Agroecologization
- Production systems with less emissions
- Less pesticides
- Soil quality improvement – less erosion, C sequestration...
- Food safety and security

Key elements/keywords

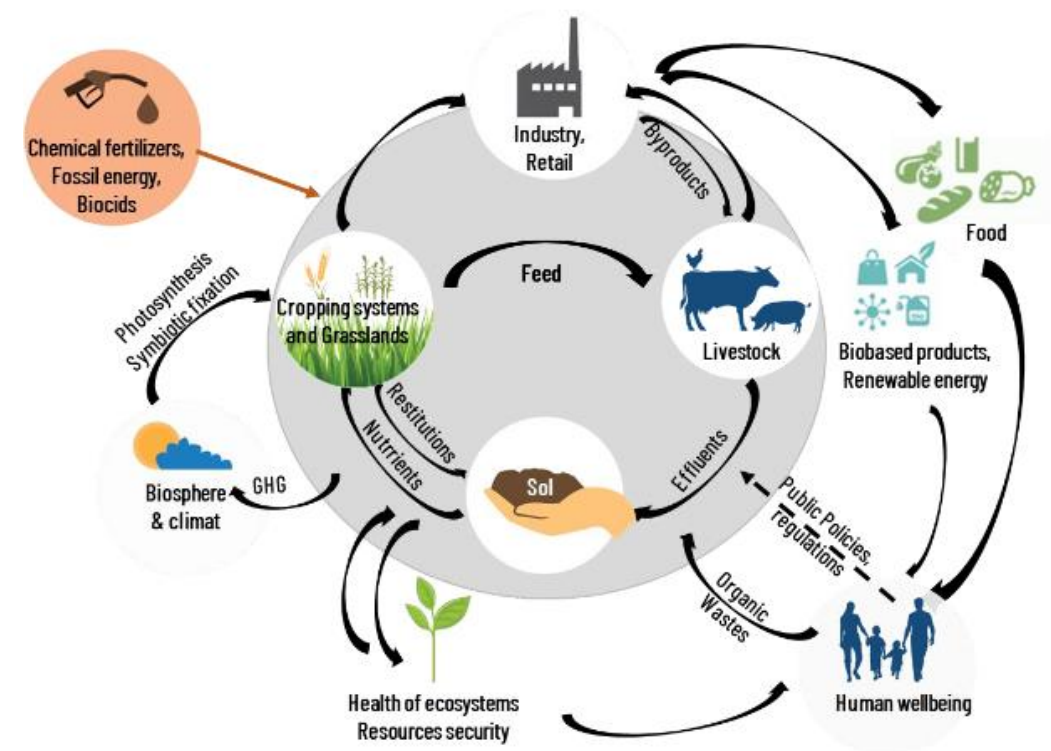
- Biomass circular management including livestock and plant, forestry, production, sustainable waste management
- Improve/save biodiversity (wild and cultural plants and animals)
- Synergies agro-food-nonfood- forestry- ecology- urban environment, agroforestry systems
- Environmental management
-

Health and quality of life goals

Health = healthy people, healthy environment, healthy economy 😊

- **Innovative food systems for health** - functional food for specified categories (improved immune response, malnutrition of elderly people, functional food for children, food for people with civilization diseases)
- **Healthy environment** - production systems in industrial polluted areas, sustainable waste management
- **Quality of life** - regional development, SMEs in the regions
-

Synergy with other domain



Examples of important currently starting projects and initiatives closely linked to the domain



Towards climate-smart sustainable management of agricultural soils, H2020 EJP Soil – 2020 – 2024



Activated (plant) gene bank network, H2020 SC2, H2020 AGENT – 2020 – 2023

URANOS – Údajová a vedomostná podpora pre systémy rozhodovania a strategického plánovania v oblasti adaptácie poľnohospodárskej krajiny na klimatické zmeny a minimalizáciu degradácie poľnohospodárskych pôd, OPVal-VA/DP/2018/1.1.3-05, 11/2019-06/2023

MEDIFUNGHI - Vyvinutie a inovácia nových zdravých potravín na báze medicínskych húb s dôrazom na zdravie človeka a jeho životné prostredie OPVal-MH/DP/2017/1.2.2-13



FNHRI in preparation - **Food nutrition and health** infrastructure, drives transdisciplinary research by connecting research-, industry- and citizen-generated data and facilities on nutrition and food environment, initiating the required food system transformation in Europe



Domain 5 coordinator

Research and Innovation Smart Specialisation Strategy (RIS3)

RIS3 – Ex-ante
conditionality for ESIF

- **2013 – RIS3 of the Slovak republic
approved by the government**

**Through knowledge towards prosperity - Research and Innovation
Strategy for Smart Specialisation of the Slovak Republic**



► *Strengthening Innovation in Europe's Regions*

Smart specialisation is an innovative approach that aims to boost growth and jobs in Europe, by enabling each region to identify and develop its own competitive advantages.

Through its partnership and bottom-up approach, smart specialisation brings together local authorities, academia, business spheres and the civil society, working for the implementation of long-term growth strategies supported by EU funds.



► SMART

Identify the region's own strengths and comparative assets



► SPECIALISED

Prioritise research and innovation investment in competitive area



► STRATEGIC

Define a shared vision for regional innovation

KEY FIGURES

- **Over 120 smart specialisation strategies** have been developed
- **Over EUR 67 billion** available to support these strategies, under the European Structural and Investment Funds and national / regional funding.
- Expected achievements by 2020: to bring **15.000 new products** to market, create **140.000 new start-ups** and **350.000 new jobs**.

Domain 5 coordinator

RIS3 SR Implementation plan 2017

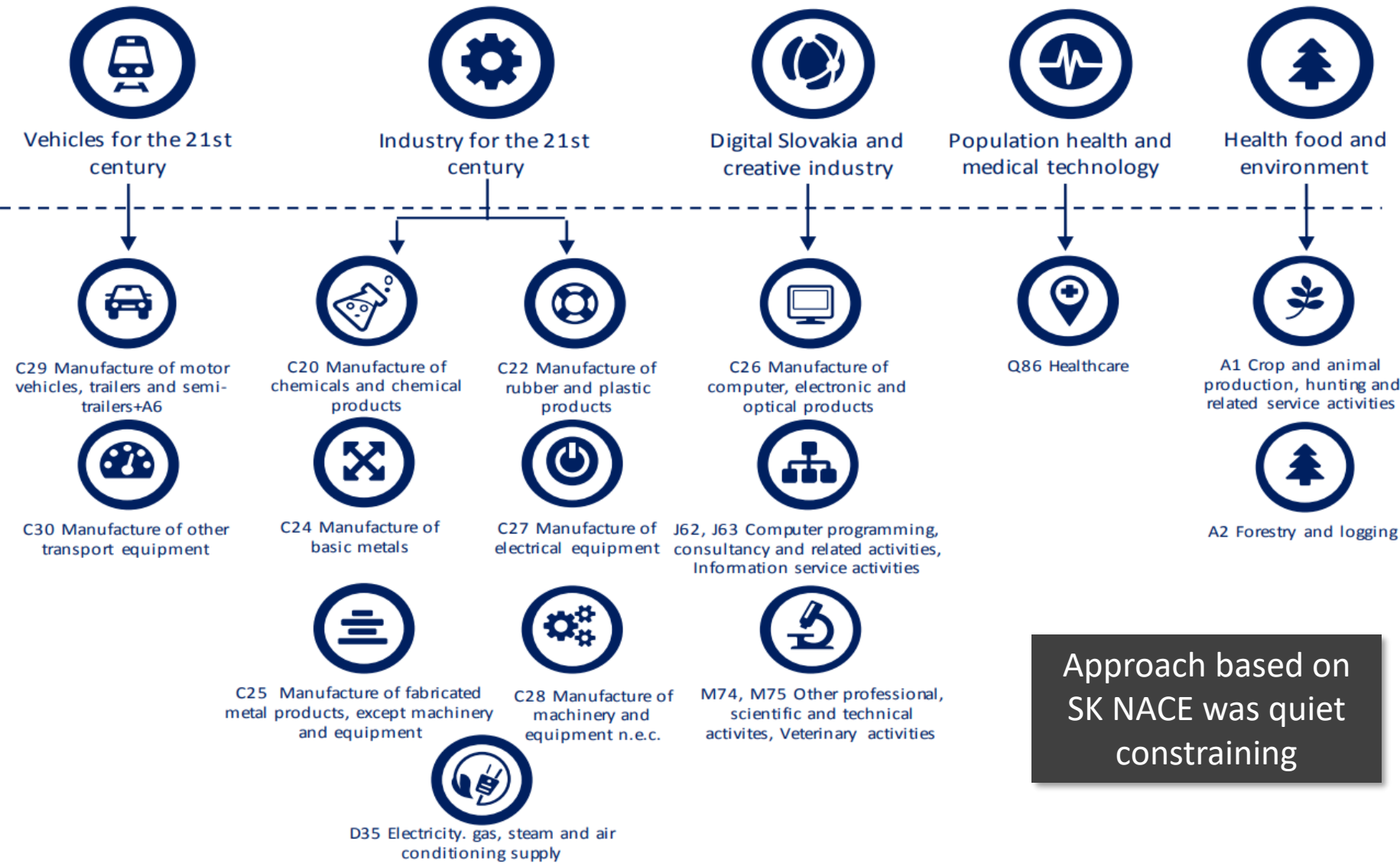


IMPLEMENTATION PLAN

Research and Innovation Strategy for Smart
Specialisation of the Slovak Republic



Overview of the smart specialisation domains and main relevant SK NACE industries



Approach based on
SK NACE was quiet
constraining

RIS3 SR Domain refinement 2020

Domain 1: Inovative industry for 21st century

Domain 2: Mobility pre 21st century

Domain 3: Digital transformation of Slovakia

Domain 4: Healthy society

 **Domain 5: Healthy food and environment**

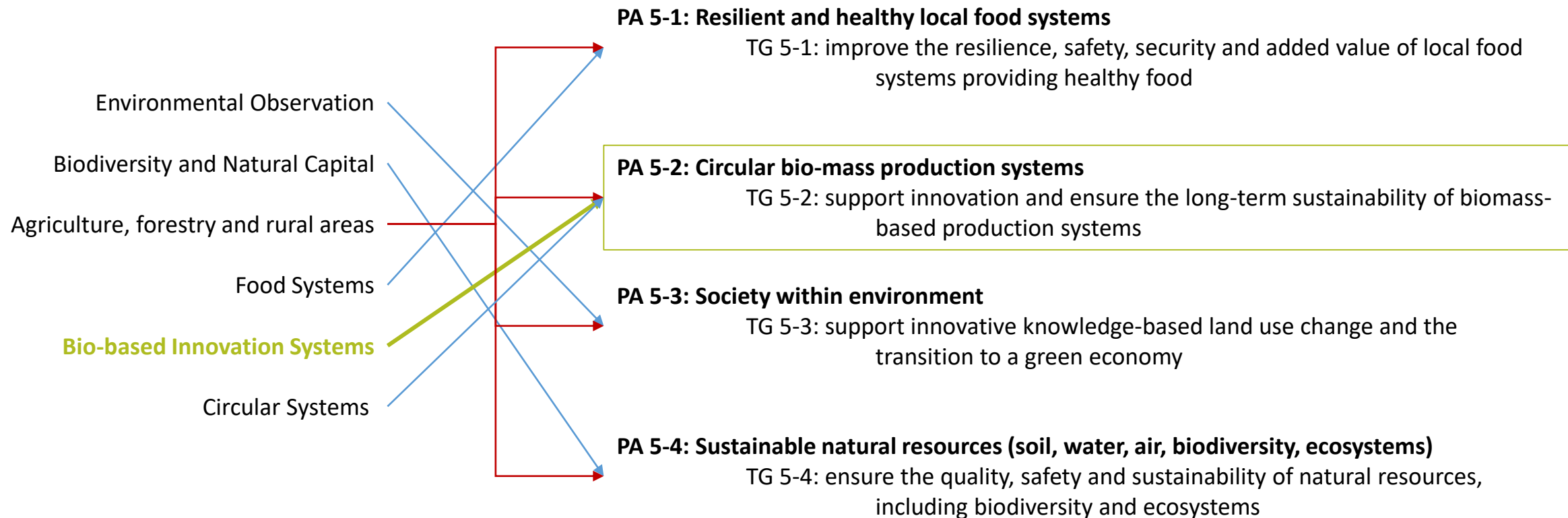
A key factor in defining the priority areas of the Domain 5 is the link to the Key Directions for Research and Innovation in Cluster 6 of the forthcoming EU Framework Program for Research and Innovation Horizon Europe.

Proposal of Priority Areas

Mapping of Key Research and Innovation Orientations of Cluster 6 in Horizon Europe onto proposed Priority Areas of Domain 4 with short definition of Transformation Goals:

Cluster 6

Domain Healthy food and environment



PA 5-2: Circular bio-mass production systems

Priority area 5-2: Circular production systems based on biomass

Transformation goal 5-2: support innovation and ensure the long-term sustainability of biomass-based production systems.

Topics of projects: biomass production, added value of biomass-based products, circular bio-economy, cascade use of biomass,...

Rationale for choice:

1. Biomass-based circular solutions have the potential to reduce our dependence on non-renewable resources.
2. Sustainable biomass-based production systems are key factors in the deployment of the bio-economy.
3. Innovations in biomass processing systems and biomass-based solutions have the potential to support the local economy and improve the quality of life in rural areas.

Examples of topics or themes overlapping with other domains:

Overlaps with Domain 1 Innovative Industry for the 21st Century: new biomass-based materials; bioenergy; biorefineries; food industry;...

Overlaps with Domain 2 Intelligent Mobility: food logistics; biomass logistics, including "biohubs"; biocorridors; autonomous vehicles for land use and management;...

Overlaps with Domain 3 Digital transformation of Slovakia: sensors; remote sensing; IoT; AI; blockchains in the food industry; simulations; precision agriculture; modeling of natural risks and hazards;...

Overlaps with Domain 4 Healthy society: functional foods, nutritional supplements and nutraceuticals and their impact on health; environmental hazards - nano and microplastics in air, water, soil, food and their impact on health; epidemiological resilience of food production; biohazards; healthy environment/quality of life;...

Cross sectorial aspects of the domain

Cross-cutting topics or goals, which we expect to be tackled within each proposed Priority Area

- Digitization
- Living-labs
- Monitoring
- Sustainability
- Knowledge transfer
- **Circular bioeconomy**
- Adaptation to climate change
- Networking
- Participation in European Research Area
- Employment
- Environment

R&I Days 2020

