

Sustainable **S**mart **S**pecialisation for the **R**e-opening  
of **I**ndustrial **S**ites in the **D**anube Region (RIS4Danu)

# Results regional analysis: Sisak-Moslavina County

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# The Team behind the analysis



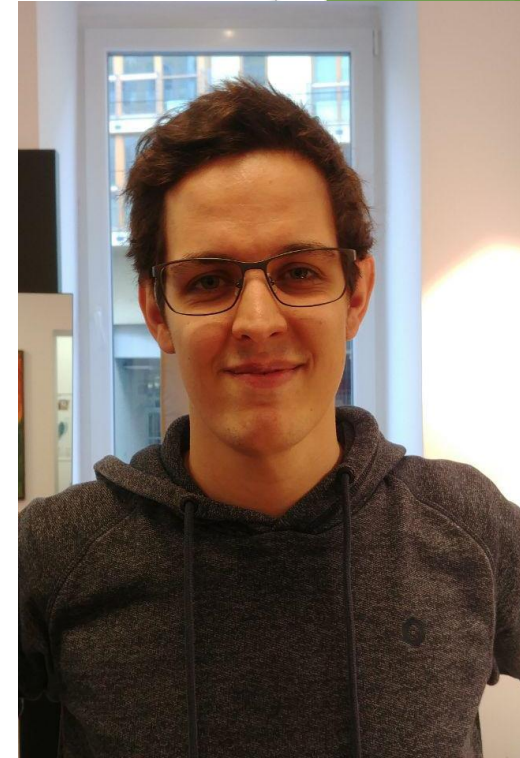
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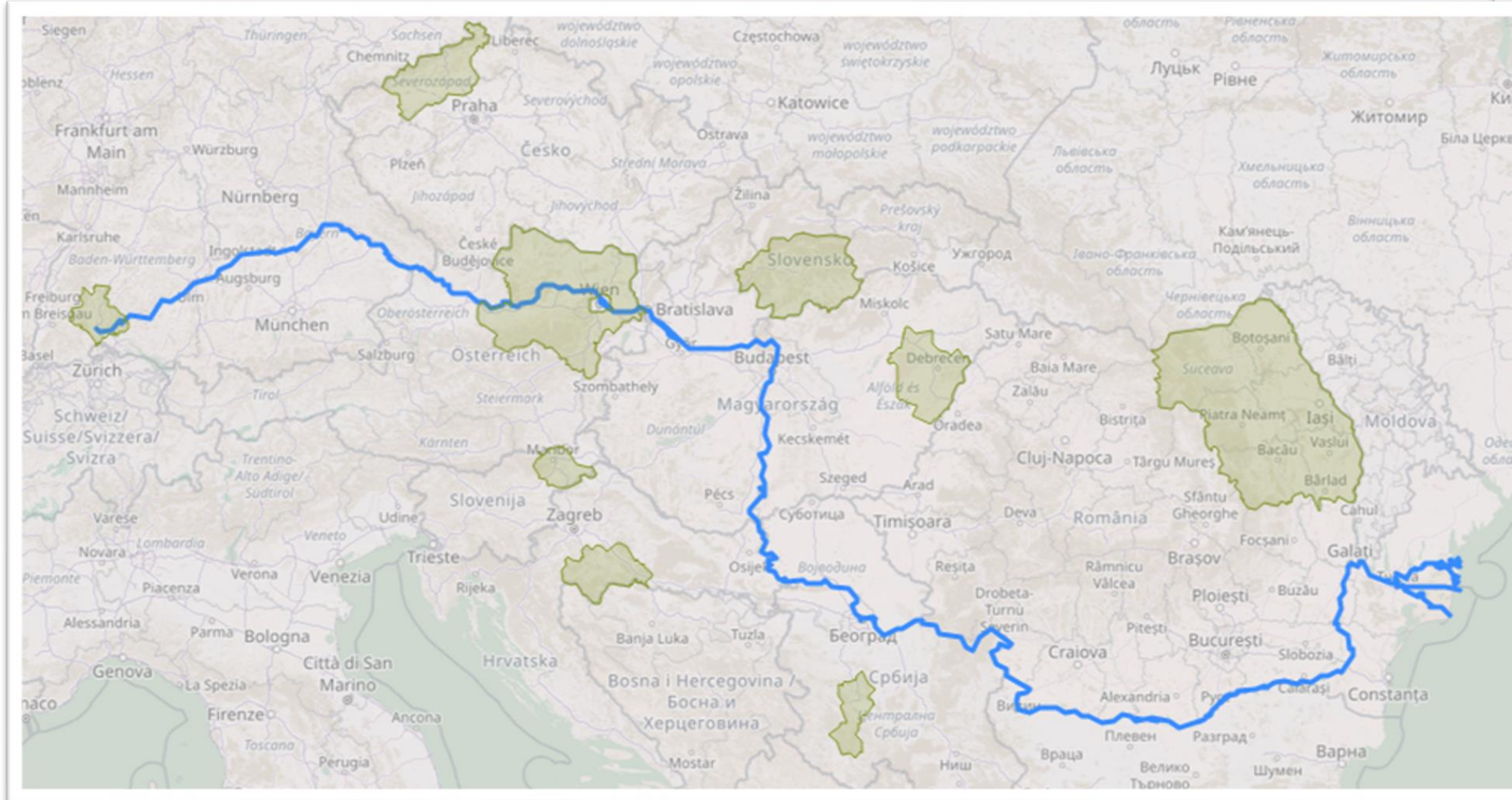


**Simon Baumgartinger,  
Postdoctoral researcher**





# RIS4Danu: Setting the scene



Source: RIS4Danu Website



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# Disclaimers

- ▶ Challenges are big & beyond the reopening of this single site --> **pragmatic, positive vision for a sustainable future**
- ▶ We are not going to present roadmaps or solutions, but **potential starting points for an Open Entrepreneurial Discovery Process**
- ▶ RIS4Danu: **2 years, 10 regions**



# Regional analysis: Sisak-Moslavina County

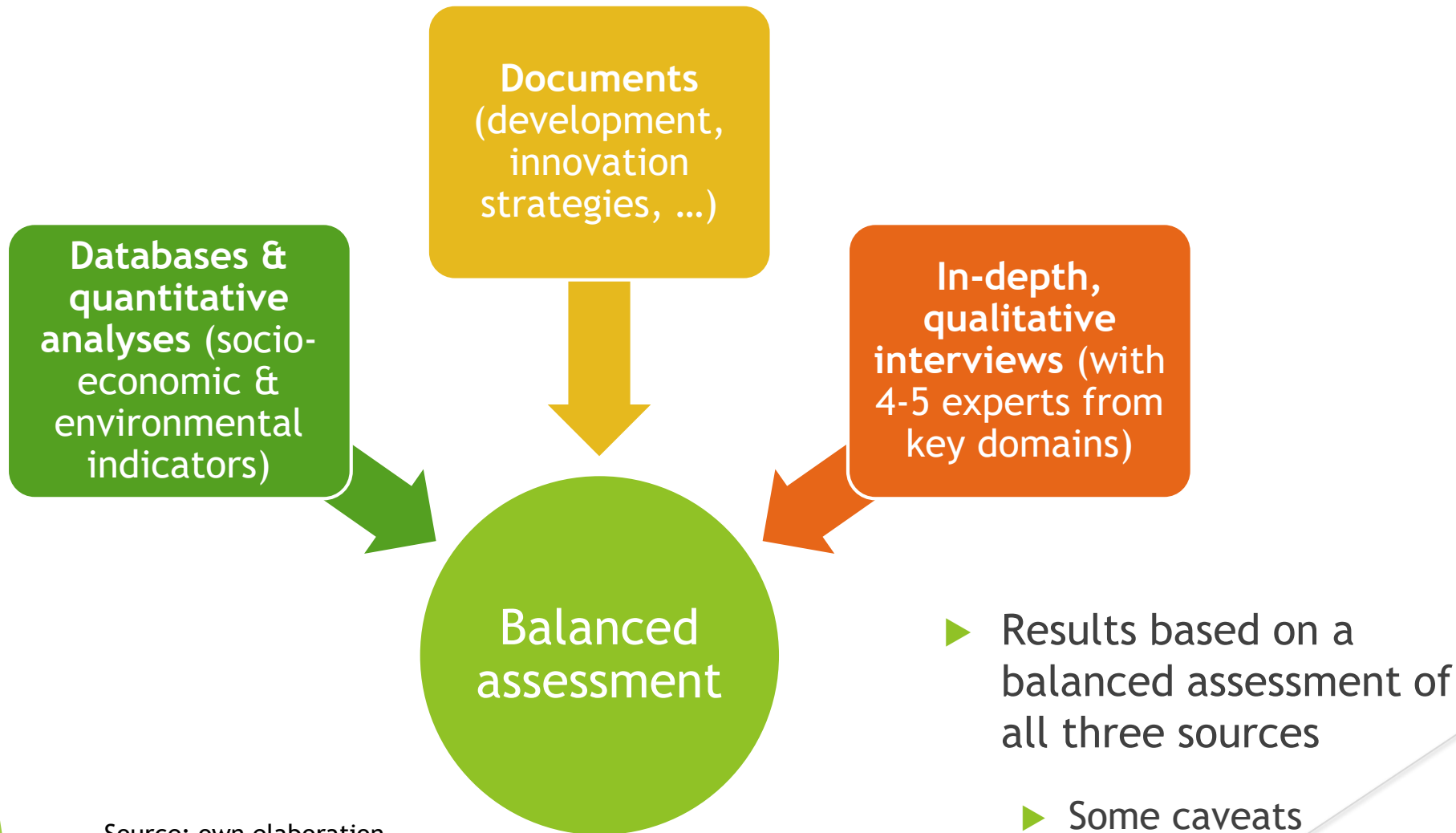


# Content of Analysis

- I. Methods
- II. General regional conditions & innovation strategies
- III. Regional Assets
- IV. Regional Challenges
- V. Conclusion



# Methods

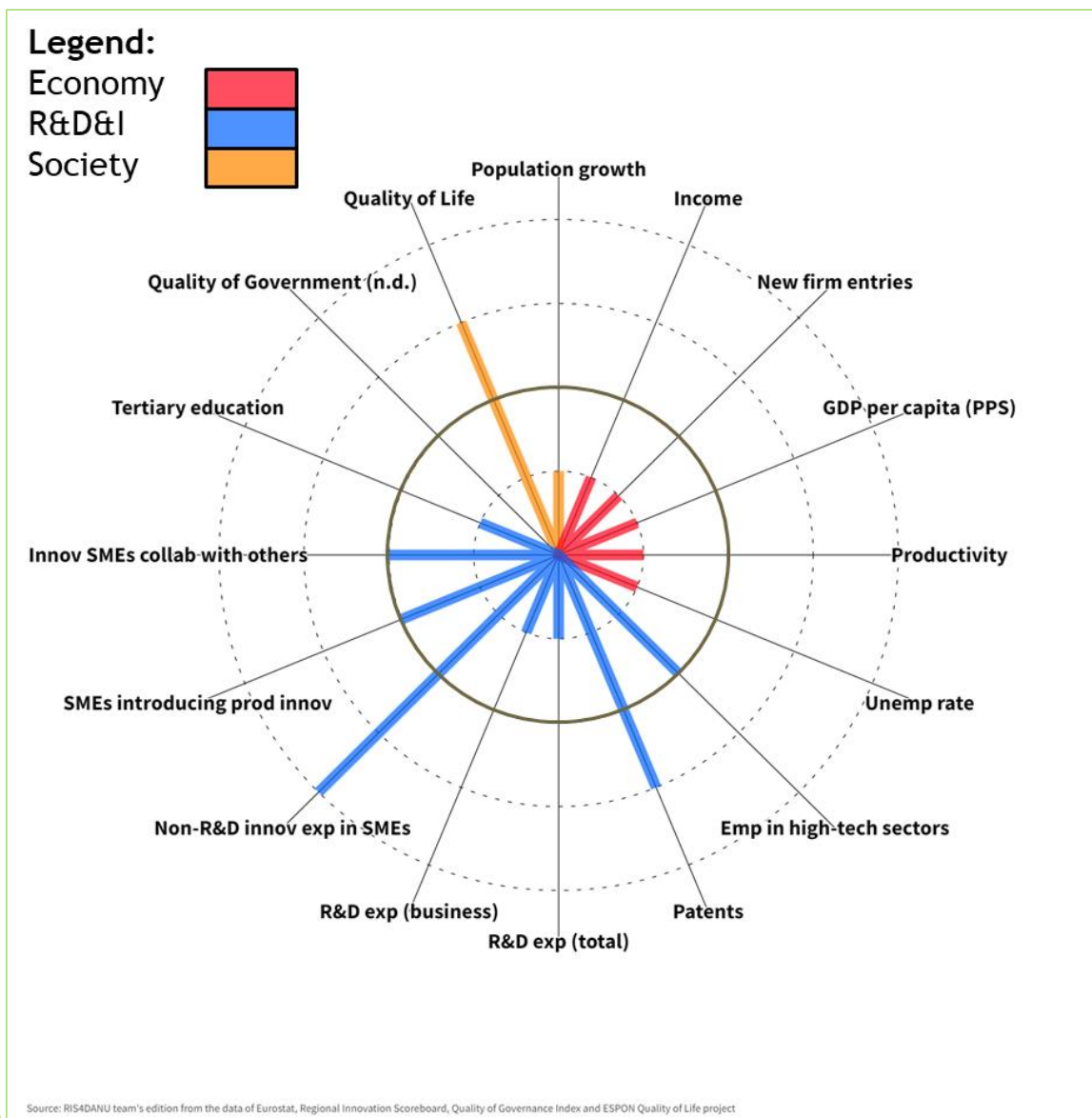


Source: own elaboration



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# Pannonian Croatia (HR02), NUTS-2 region



▪ **Reg Inno Scoreboard (2021): Emerging innovator +**

**Top 3 industrial activities (% of the total workforce, 2019):**

- Manufacture of food products (6.72%)
- Manufacture of fabricated metal products (5.26%)
- Specialised construction activities (4.90%)

**Top 3 most dynamic industrial activities\*  
(growth rate of the workforce in the period 2014-2019):**

- Manufacture of fabricated metal products (+19.3%)
- Manufacture of machinery and equipment (+14.6%)
- Manufacture of wood and of products of wood and cork (+12.8%)

\*Only those activities have been included in which at least 1.5% of the total number of persons employed has been working

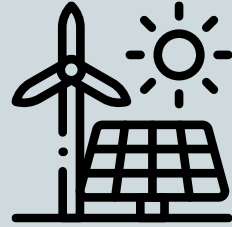




# Documents: Key transformative fields

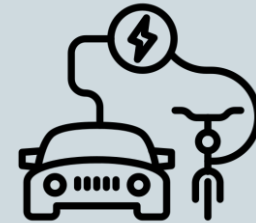
## National S3 priorities

**Energy & Sustainable Environment**  
 (Energy technologies, systems and equipment; Env. friendly technologies, equipment and advanced materials)



**Health and Quality of Life**  
 (Bio-pharmaceuticals, medical equipment; Health services, new methods of preventive medicine and diagnostics; Nutrition)

**Food and Bioeconomy**  
 (Sustainable food production and processing; Sustainable wood production and processing)



**Transport and Mobility**  
 (Scarce materials, lightweight construction, sustainable production processes, recycling, qualification of engineers/skilled workers)

**Security**  
 (Cyber security; Defence dual-use; Mine action programme)



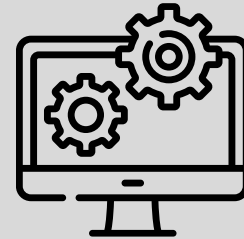
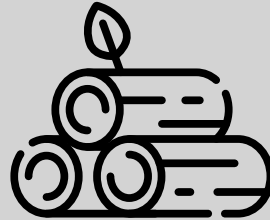
# Documents: Key transformative fields

Plan for the industrial transition of Pannonian Croatia (2022):

Key sectors & their niches for industrial transition

## Wood processing industry

(Interiors made of wood, green and low carbon construction, floor coverings, designer furniture)



## ICT sector

(Digital agriculture, games and gamification, smart mobility, key technologies: e.g. AI, big data)

## Agriculture and food processing

(Cultivation of high-value crops, e.g. berries, hazelnuts; access large centres; perishable foods)

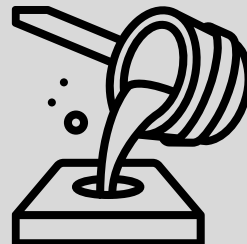


## Tourism sector

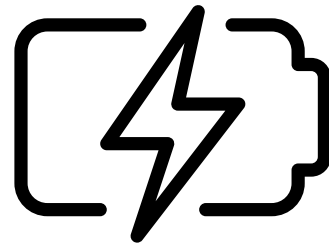
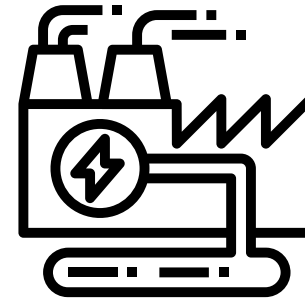
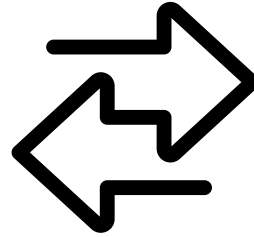
(Wellness tourism, deluxe gastro & culinary tourism, cultural tourism, active tourism)

## Metal processing industry

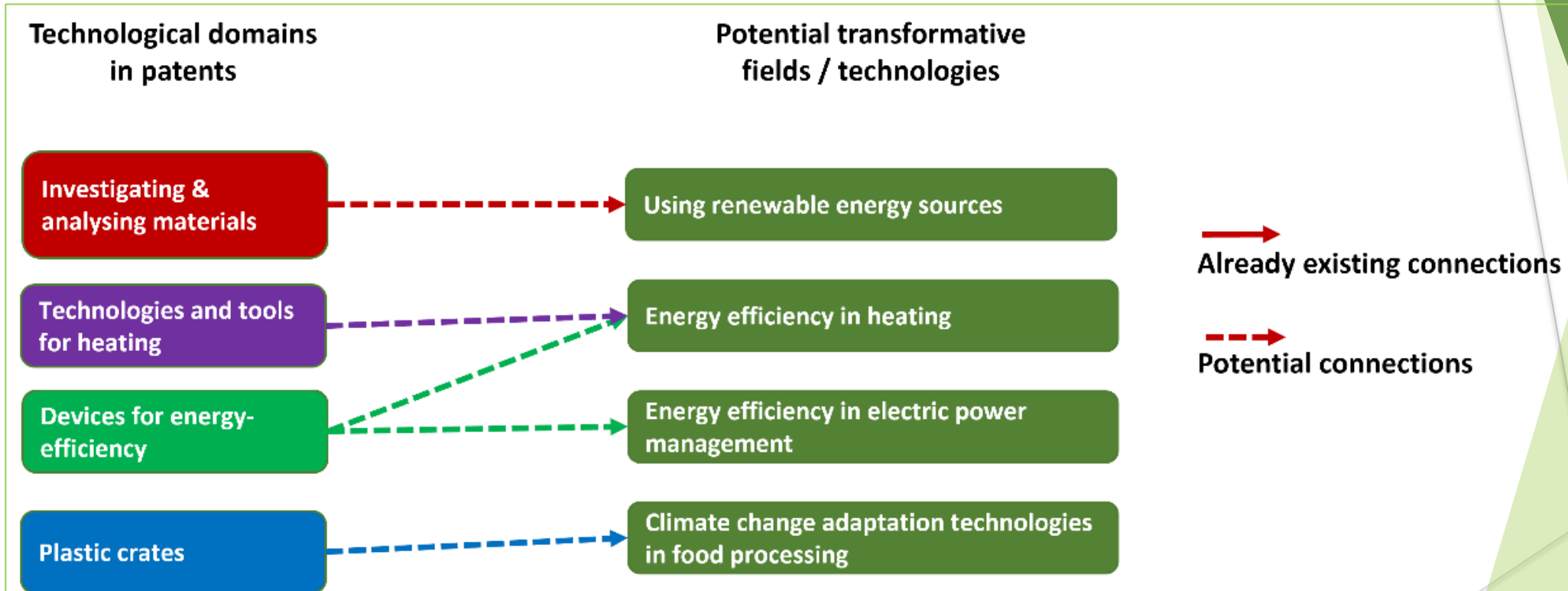
(Clean and green technologies, smart solutions for agriculture and forestry, dual purpose products)



# Assets



# 1) University and R&D activity



*Note: Relative technology advantage means that a given technology field, in relative terms, is more frequently applied in patents of the region (Pannonian Croatia) than in overall patents of Croatia*



## 2) (New) economic sparks: ICT, (sustainable) agriculture, tourism

### The ICT industry in Pannonian Croatia

- ❑ Main specialisation: *Programming, data processing and related activities*
- ❑ Jobs: 2732
- ❑ Annual sales revenue: 1.1 billion HRK
- ❑ Annual growth rate of sales revenue: 16,7% (2016-2019)
- ❑ Industry structure: 612 companies, dominance of micro-enterprises (93% of income was realized in 569 micro-enterprises)
- ❑ Expenditure on research: 26,3 million HRK (FINA 2019)
- ❑ Share of R&D expenditures of total revenue: 2,35%

Industrial transition plan Pannonian Croatia (2022)

*Thirty years ago, we had a heavy industry here. Everything collapsed. We had a war and crises and everything. And we were wondering... what should we do to keep the young people here? We started to work on this big initiative called "PISMO - center of gaming industry".*

Andreja Seperac, Deputy Director RDA Simora, source: European Commission, 2020

### Gaming industry - PISMO Project

- ❑ Total cost: 3,3mio; 80% financed by EU, JTF funded
- ❑ 67 companies and start-ups in 2020, three times the number envisioned at its launch in 2017
- ❑ Example: Smart glasses for people with hearing impairment, converts sound in text on lenses in real time
- ❑ Explicitly addressing young, unemployed people

Expert interview & European Commission, 2020

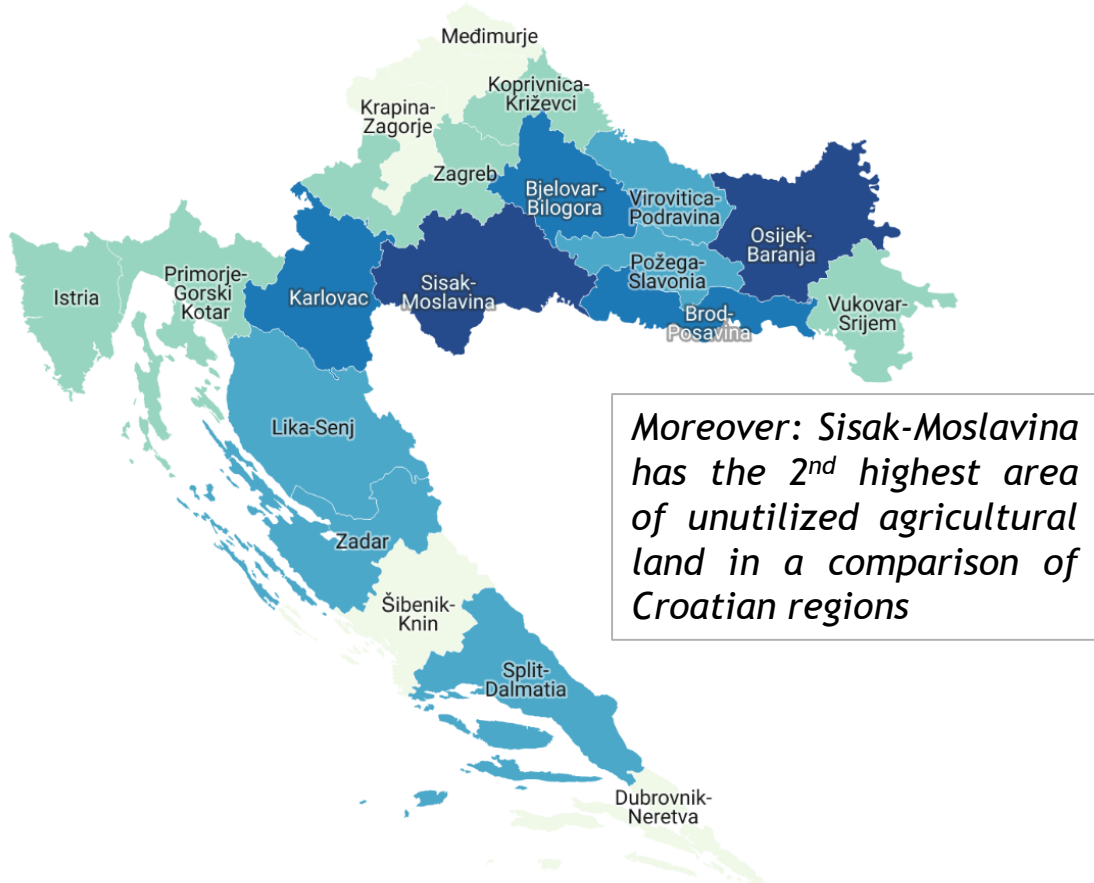
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# 2) New economic sparks: ICT, (sustainable) agriculture, tourism

Agricultural holdings with organic farming (2020)

< 100   100-200   200-300   300-400   ≥ 400

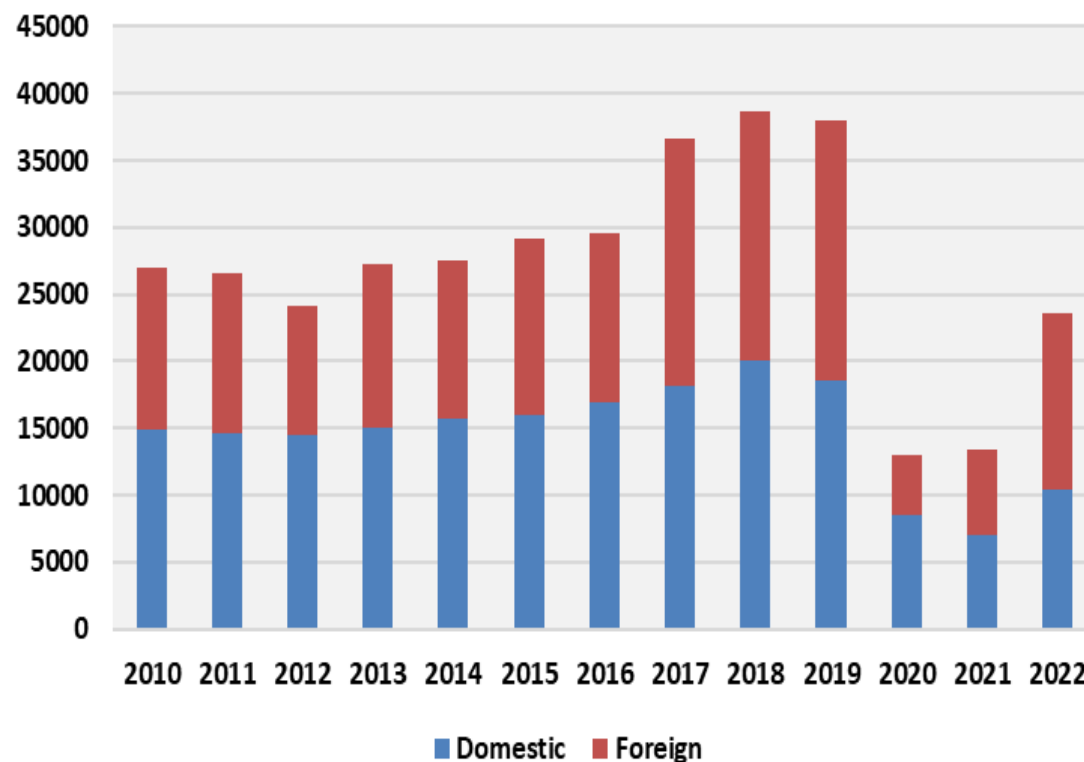


Moreover: Sisak-Moslavina has the 2<sup>nd</sup> highest area of unutilized agricultural land in a comparison of Croatian regions

Source: Croatian Bureau of Statistics - Agricultural Census 2020

Source: Croatian Bureau of Stati

Tourist arrivals in commercial accommodation establishments (2010-2022)



Source: Croatian Bureau of Statistics



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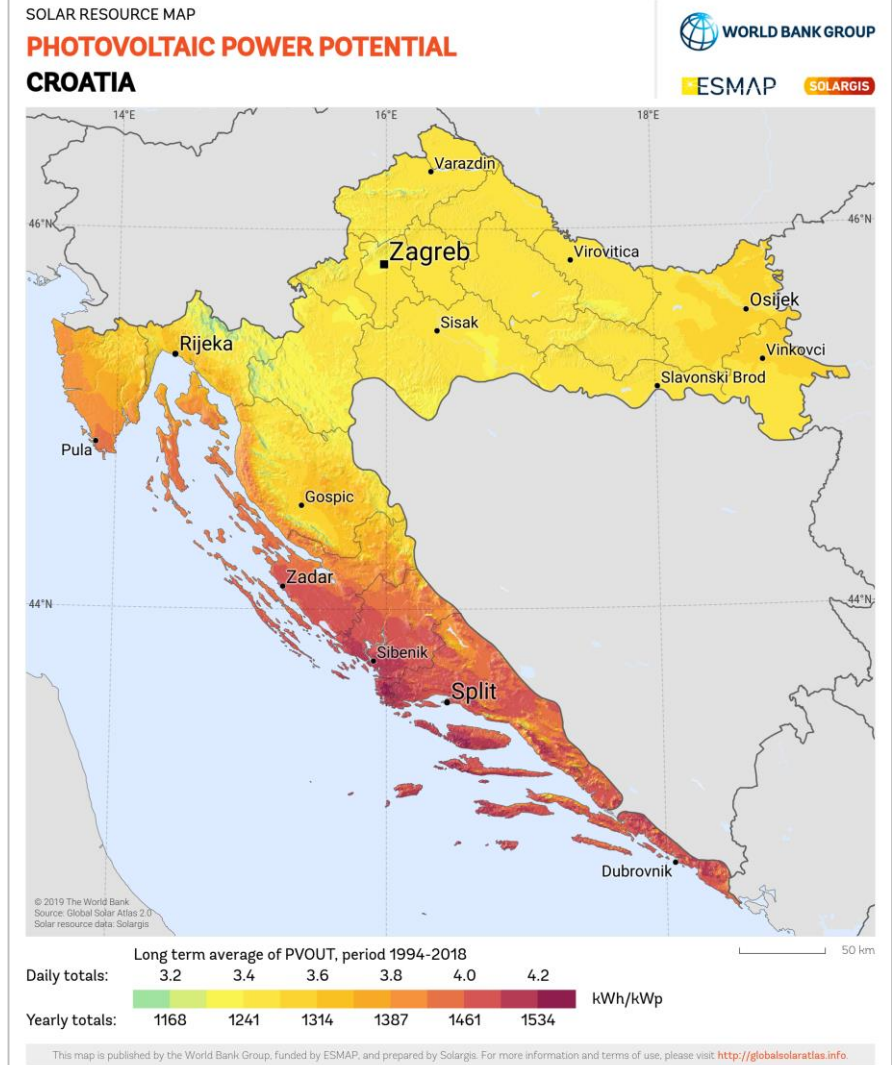
# 3) Renewable energy potential (esp. biomass & geothermal heating)

*“Despite vast potential and recent expansion of renewables, Croatia’s energy consumption mix is still dominated by fossil fuels. Croatia is increasingly exposed to climate change and natural disasters and climate adaptation is a priority. Furthermore, with a high energy intensity and low energy efficiency relative to EU peers, its national climate strategy is moderately ambitious and only partially integrated with its energy strategy.”*

IMF report on Energy Security and Climate Change: Challenges and Opportunities for Croatia, 2023

*“In accordance with the existing potential for the use of renewable energy sources in the area of the county, the energy potential of biomass can be highlighted, as well as the potential of geothermal energy for the production of thermal energy for various purposes.”*

Development Strategy SMZ 2017-2020 [2017], p.32



# 4) New industries with strategic importance: solar, battery, ceramics

*“Sisak, which has lately been more known for bad economic news concerning local ironworks and oil refinery, by the end of this year will host a plant for the production of solar cells, which will be an integral part of Sertić’s new solar business”*

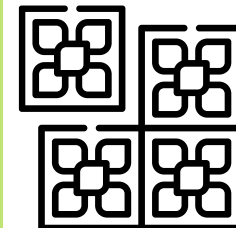
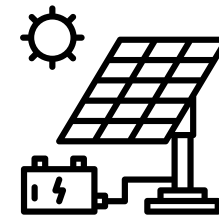
Total Croatia News, 2017

Sunseco - one of Sertić’s companies - is also active in the electric car battery industry and has recently announced a 220 million investment into the region to build a new factory, which should be start operations in 2024.

Balkan Green Energy News, 2021

Applied Ceramics, the entrepreneur’s main firm, has been operating in the region for quite a while and is producing ceramic, quartz, silicon and sapphire components for the semiconductor, solar, fuel cell, microchips industries.

Croatia Week, 2021



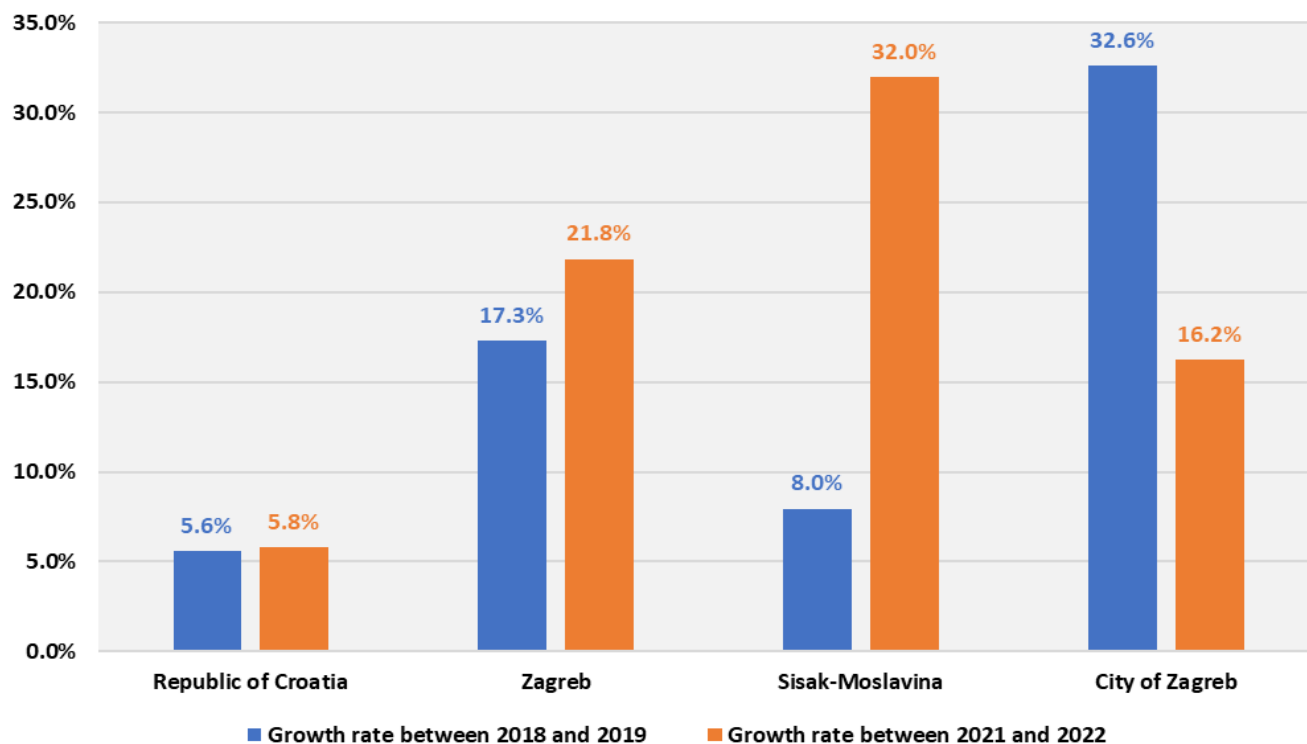
Source: Foundation for European Progressive Studies



Funded by the European Union

# 5) Transformative resilience: Opportunity in times of change

EU-Commission: €179 million from the Just Transition Fund (JTF) will be invested in Croatia thanks to the approval of a multi-fund programme under Cohesion Policy. The Fund will support the counties of Istria and Sisak-Moslavina in delivering a just climate transition [...].



Growth rates of building permits in Croatian regions,

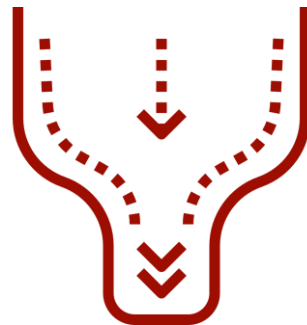
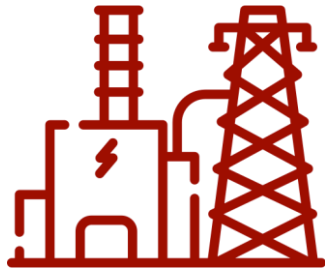
Source: Croatian Bureau of Statistics

Note: Covering building permits issued for new constructions and reconstructions of existing constructions

*“If you have asked me that question three years ago, I would say strongly no. But today I’m slightly changing that opinion because there are many things that have had politicians and people in the region work in the different directions, but especially the last few years with the earthquake and floods have made people work together again. [...] Yes, there are some good changes in the Sisak-Moslavina County. [...] Young people want something else. They are not any more burdened by past times and war, and they have totally different priorities. They want green actions. They want better public services and they ask for it daily.*

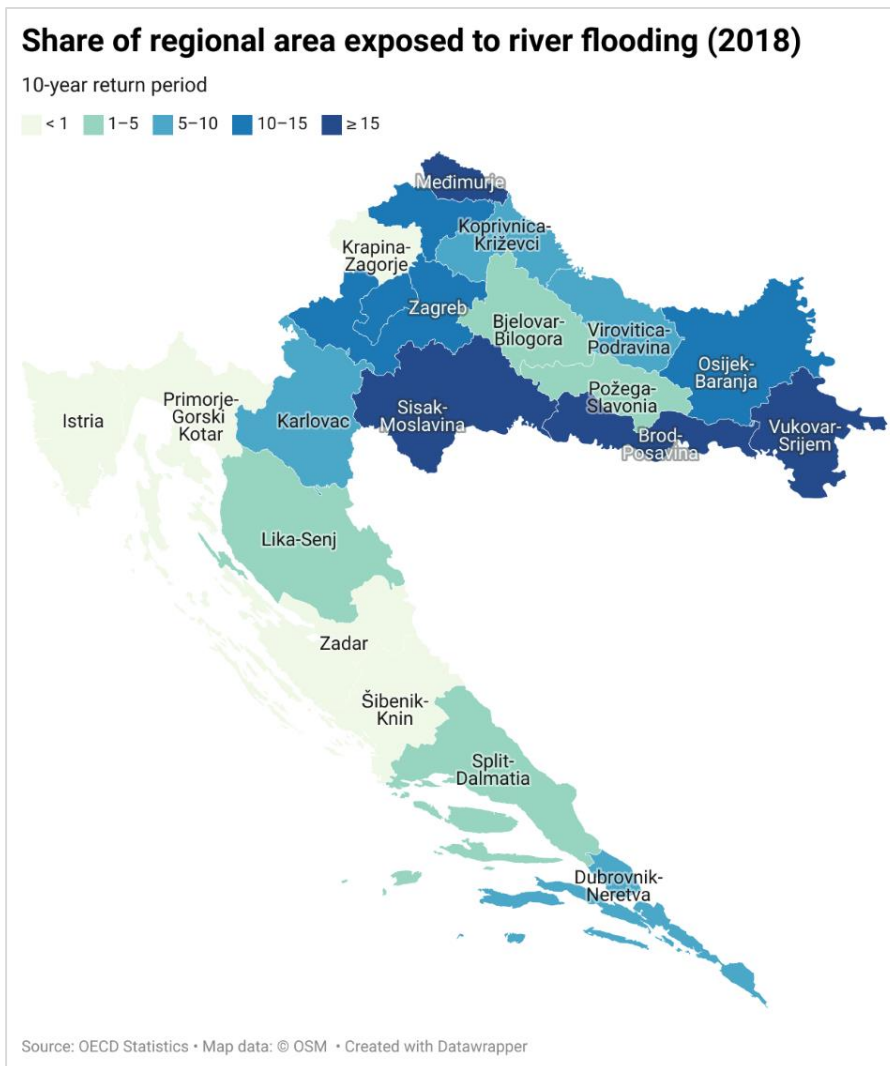
Expert interview

# Challenges





# 1) Climate change impact: floodings



Source: OECD Statistics

## Climate change indicators of the Sisak-Moslavina County

Projected change in heat wave days: increase by 8 days

Wildfire hazard: 0.1% of the total area classified as 'burnt areas'

Fluvial hazard: 23.6% of the county's area\*

Population in settlements exposed to fluvial flooding: 13.9% of the county's population\*

Road infrastructure exposed to fluvial flooding: 22.5% of the county's road infrastructure\*

Transport nodes exposed to fluvial flooding: 16.7% of the county's transport nodes\*

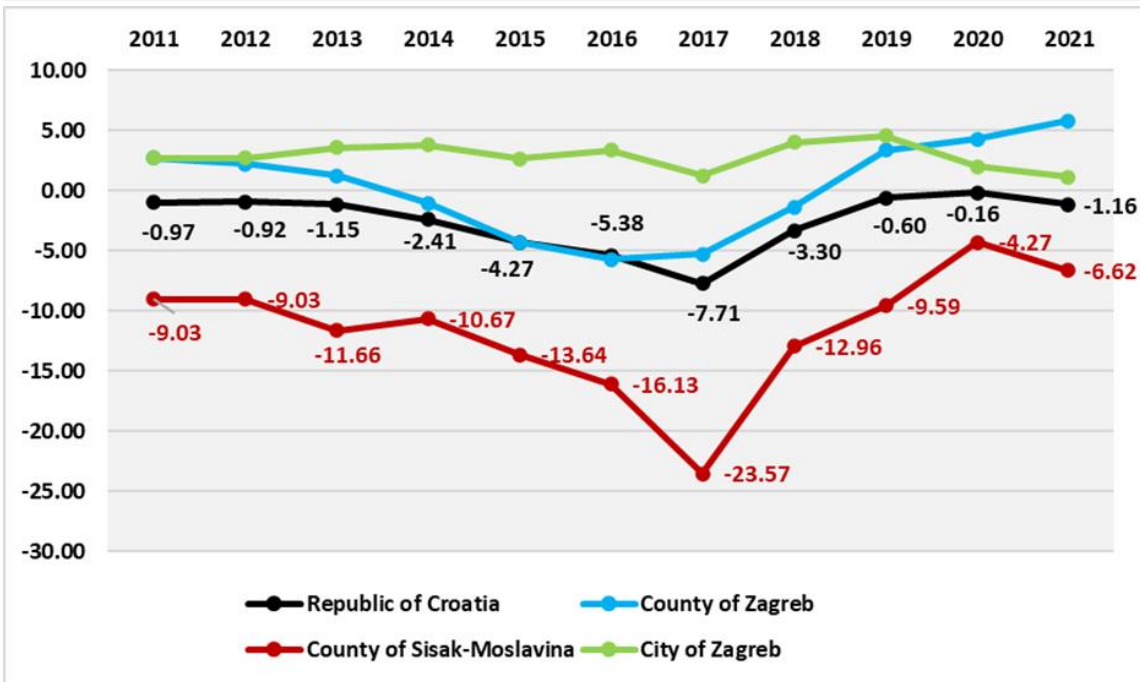
Power plants exposed to fluvial flooding: 33.5% of the county's power plants\*

Hospitals exposed to fluvial flooding: 25% of the county's hospitals\*

Source: European Climate Risk Typology; note: "Above average" level means that the value of the county is considerably higher than the average value of the European regions;  
\*The floodings related hazards are calculated always on the basis of how many percentages of the analysed factors would be exposed to a 1 in 100-year flooding event

# 2) Outmigration, loss of population, labour market frictions

The net migration rate in Sisak-Moslavina County compared to Zagreb, the County of Zagreb and the Croatian average



Source: OECD Statistics

Male and female unemployment rates in 2022



Source: Croatian Bureau of Statistics



# 3) Energy-intensive industrial structure

**Green house gas emissions from industry (2018)**

In Mt of CO2 equivalent



Source: OECD Statistics • Map data: © OSM • Created with Datawrapper

Source: OECD Statistics

Branches	Relative employment share within the branch
Manufacture of beverages	3 <sup>rd</sup> / 4 NUTS-2 regions
Manufacture of tobacco products	2 <sup>nd</sup> / 4 NUTS-2 regions
Manufacture of wearing apparel	2 <sup>nd</sup> / 4 NUTS-2 regions
Manufacture of wood and of products of wood and cork	1 <sup>st</sup> / 4 NUTS-2 regions
Manufacture of chemicals and chemical products	1 <sup>st</sup> / 4 NUTS-2 regions
Manufacture of rubber and plastic products	2 <sup>nd</sup> / 4 NUTS-2 regions
Manufacture of fabricated metal products, ex. machinery & equipment	2 <sup>nd</sup> / 4 NUTS-2 regions
Manufacture of machinery and equipment n.e.c.	1 <sup>st</sup> / 4 NUTS-2 regions
Manufacture of furniture	1 <sup>st</sup> / 4 NUTS-2 regions

Source: Eurostat: Note 1: Relative employment concentration: those branches in which the relative employment share in Pannonian Croatia NUTS-2 region is higher than the national average (it means that the location quotient of value of the region is higher than 1 in these branches)

Note 2: Branches that include energy-intensive activities (classification by the European Commission) are highlighted in grey

# 4) Waste management and environmental degradation

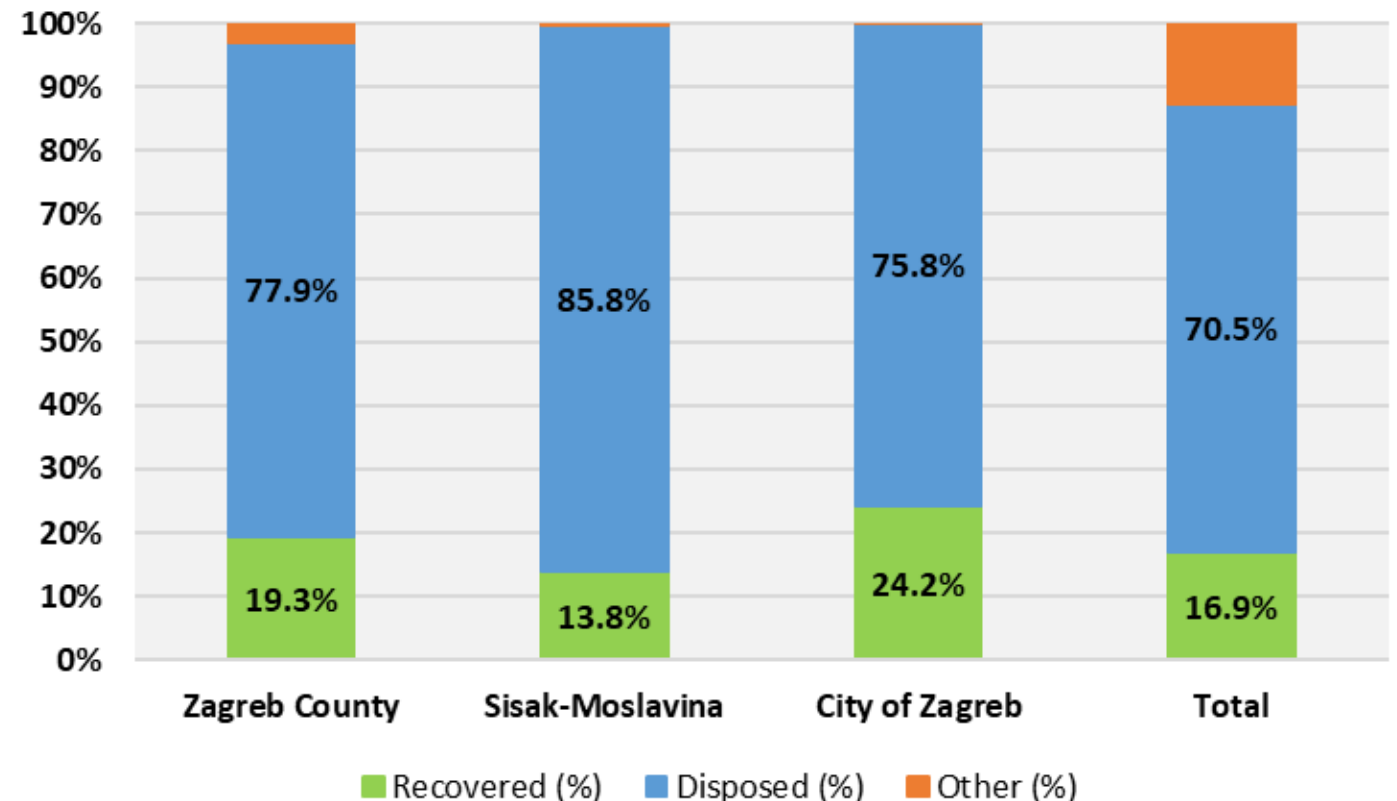
*“Waste disposal is one of the biggest environmental problems in SMŽ, since waste in a large number of local self-government units is still disposed of in unorganized landfills.”*

Regional Development Strategy SMZ 2017-2020, p. 30

*“And waste is the a component of EU funding, which is very problematic for Croatia ... we will not achieve the indicators that we need to by the end of 2026 and there will be some fees extra for that. And this part was very neglected even in big cities. And this is a major issue there in the future.”*

Expert interview

Municipal waste management in 2022 with the rates of disposal and recovery of municipal waste collected as part of public services



## 5) Bottlenecks of transformation: infrastructure, awareness, history

*“So even the word transition is very sensitive, you know. Cause of that transition, which was not successful, which was not something that you bring to public like because the steam factory, the transition was like 10,000 people lost their jobs... bought by a Russian company. Then the Russian kicked out 5000 people. Then the American bought the company. Now the Italian is the owner and have a list of 1000 employees. So, you know, this was a shock, a very big shock for all the city and all the area. And when you say here, transition... So we are very careful even to use this word. We are trying to find something I don't know less provocative”*

Expert interview

*“We didn't have basic infrastructure. European acts are too progressive in some way for things we needed to do. You cannot innovate if you don't have basic infrastructure. In many areas we still lack basic infrastructure, [...] Innovation should be the crown of everything. So if you don't have the basic line, you cannot do the roof. Foundation is of course important.*

*So we coped for many years for the foundation part, although we have progressed in some areas better than the rest of the European Union members. But there are still many, many fields that we need to do more.”*

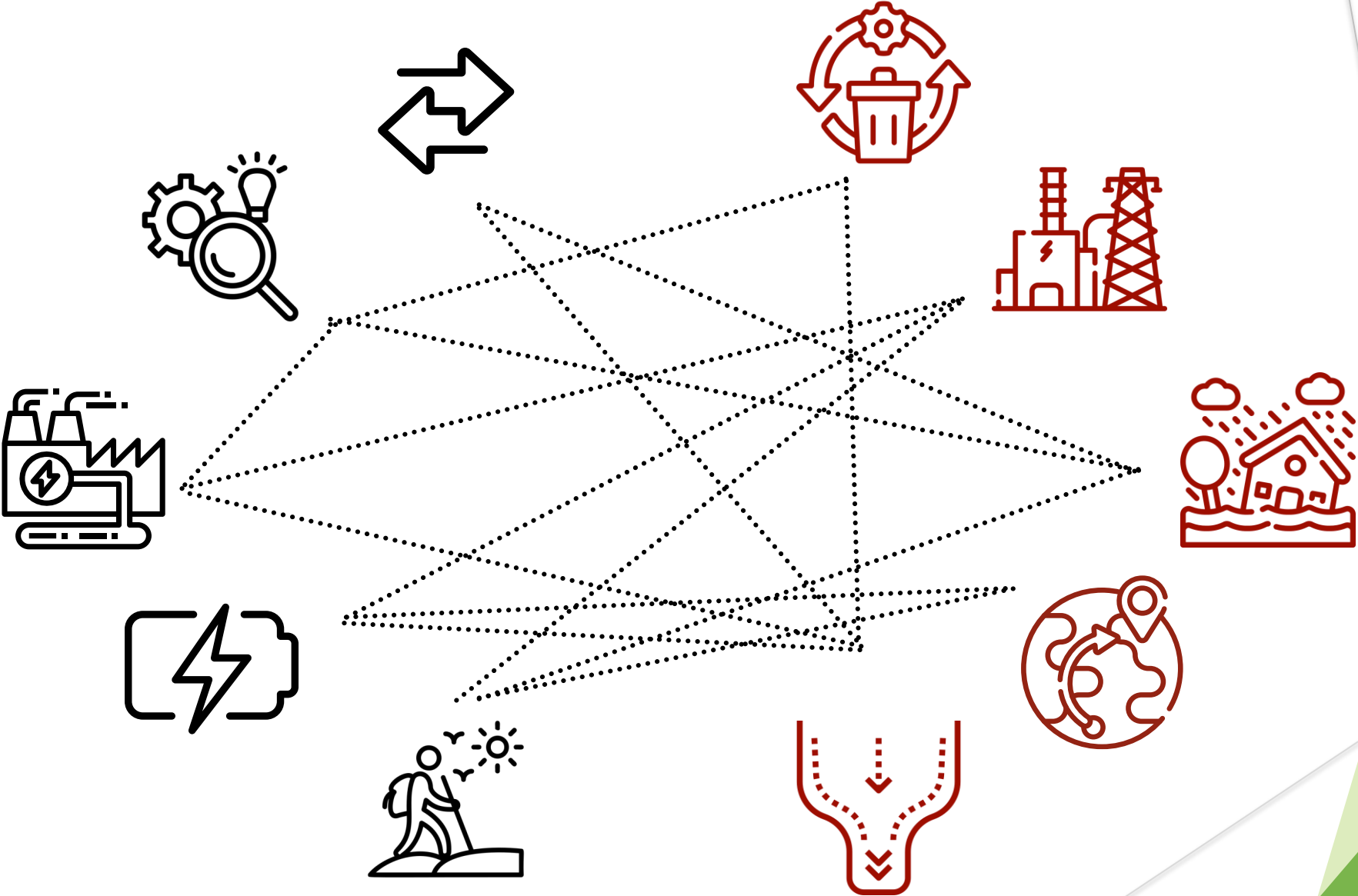
Expert Interview



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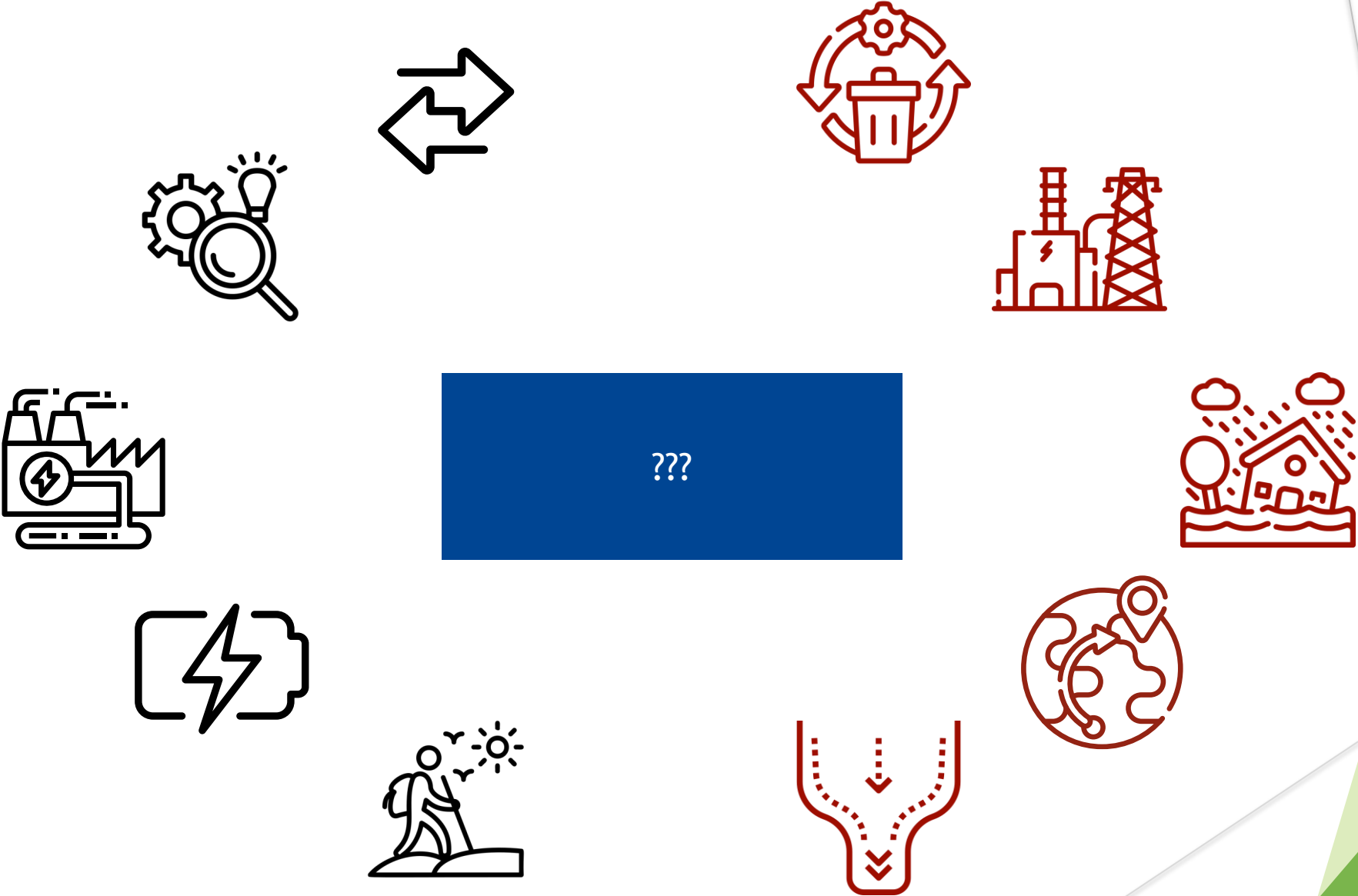
# Conclusion



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# Conclusion



# References

- ▶ CORDIS - EU research projects under Horizon 2020 (2014-2020)
- ▶ Development Strategy SMZ 2017-2020 [2017], p.32
- ▶ Diemer, A., Iammarino, S., Rodríguez-Pose, A. & Storper, M. (2022): The Regional Development Trap in Europe, *Economic Geography*, DOI: 10.1080/00130095.2022.2080655
- ▶ ESPON Locate project: <https://www.espon.eu/low-carbon-economy>
- ▶ European Commission (2014): National/regional innovation strategies for smart specialisation (RIAS3). Brussels.
- ▶ European Commission (2021): Regional Innovation Scoreboard 2021. Available online: [https://research-and-innovation.ec.europa.eu/statistics/performance-indicators/regional-innovation-scoreboard\\_en](https://research-and-innovation.ec.europa.eu/statistics/performance-indicators/regional-innovation-scoreboard_en)
- ▶ European Commission, 2020; [https://ec.europa.eu/regional\\_policy/en/projects/Croatia/pismo-croatia-s-sisak-moslavina-county-positions-itself-as-a-hub-of-gaming-expertise](https://ec.europa.eu/regional_policy/en/projects/Croatia/pismo-croatia-s-sisak-moslavina-county-positions-itself-as-a-hub-of-gaming-expertise)
- ▶ Eurostat: Regional statistics by NUTS classification
- ▶ Flaticon: Premium account ([simon.baumgartinger-seiringer@univie.ac.at](mailto:simon.baumgartinger-seiringer@univie.ac.at))
- ▶ <https://balkangreenenergynews.com/croatias-sisak-to-get-eur-220-million-electric-car-battery-factory/>
- ▶ <https://ec.europa.eu/european-social-fund-plus/en/news/skills-and-jobs-green-transition-croatia>
- ▶ <https://total-croatia-news.com/news/made-in-croatia/croatian-company-to-compete-against-elon-musk-s-tesla/>
- ▶ <https://www.croatiaweek.com/meet-the-unsung-croatian-american-hero-of-sisak/>
- ▶ IMF report on Energy Security and Climate Change: Challenges and Opportunities for Croatia, 2023 (<https://www.elibrary.imf.org/view/journals/002/2023/234/article-A002-en.xml>)
- ▶ JRC. 2022. SDG Mapper. Map the SDGs in any document and explore the Goals and targets in real-time. Available online: <https://knowsdgs.jrc.ec.europa.eu/sdgmapper>
- ▶ Keep.eu: Interreg projects' database of the European Commission (<https://keep.eu/>)
- ▶ Michaela Trippel, Simon-Baumgartinger-Seiringer, Veronika Desch, Sebastian Fastenrath & Balasz Pager (2022): Outline of S4 Methodology, Available online: [https://ris4danu.eu/wp-content/uploads/2022/10/D3.1\\_Outline-of-S4-Methodology\\_V1.0.pdf](https://ris4danu.eu/wp-content/uploads/2022/10/D3.1_Outline-of-S4-Methodology_V1.0.pdf)
- ▶ OECD REGPAT Database (Spring 2022 version): <https://www.oecd.org/sti/inno/intellectual-property-statistics-and-analysis.htm#ip-data>
- ▶ Schot J. & E.W. Steinmüller (2018): Three frames for innovation policy: R&D, systems of innovation and transformative change, *Research Policy*, DOI: [10.1016/j.respol.2018.08.011](https://doi.org/10.1016/j.respol.2018.08.011)
- ▶ Termeer, C. & Dewulf, A. (2019): A small wins framework to overcome the evaluation paradox of governing wicked problems, *Policy and Society*, DOI: 10.1080/14494035.2018.1497933
- ▶ The RIS4DANU Project Website, Available online: <https://ris4danu.eu/>
- ▶ Trinomics et al. 2020. Study on energy prices, costs and their impact on industry and households. Final report. European Commission

