



Zmena klímy, dekarbonizácia a  
výhľady a scenáre na roky 2030 a  
2050: Využitie a implikácie pre  
tvorbu verejných politik.

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**Európska únia**  
Európsky sociálny fond

Tento projekt je podporený z Európskeho sociálneho fondu.

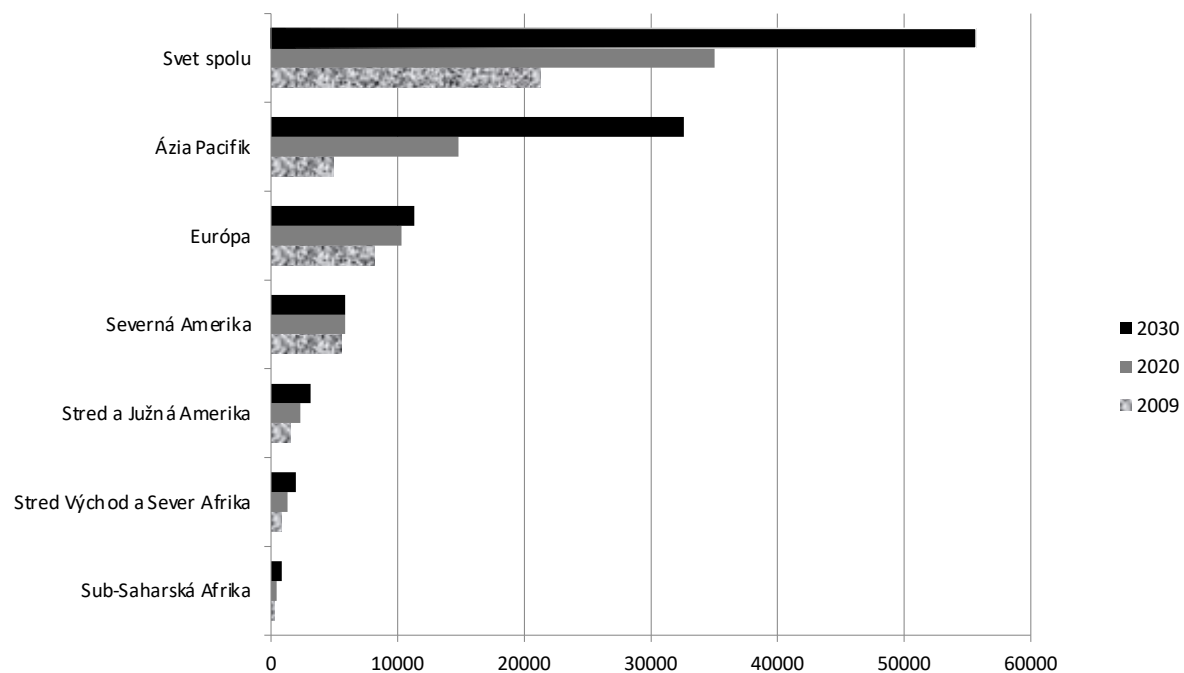


*Väčšina ľudí ktorá sa pýta, ako máme zastaviť globálne otepľovanie sa v sa v realite pýta na niečo iné. Čo ich zaujíma je, ako môžeme zastaviť globálne otepľovanie bez toho, aby sme zásadným spôsobom zmenili náš životný štýl, ktorý to spôsobuje.*

## 2 základné systémové rozpory

- **Tempo využívania zdrojov je súčasne sociologickou aj ekonomickou kategóriou:** Kapitál má sociálnu aj politickú moc nad pracovnou silou, ale zároveň čelí problému inherentnej tendencie ku vzniku krízy z nadprodukcie. Ak kapitál príliš tlačí na cenu práce, zvýši svoju ziskovosť, ale zároveň zvyšuje riziko krízy z nadprodukcie. Preto musí konštantne prichádzať s inováciami, novými produktmi, systémami pôžičiek, lízingov a iných marketingových nástrojov. Zvyšovať predaj je nevyhnutnosť. Dopadom je tlak na prírodné zdroje, odpad a deštrukcia životného prostredia.
- **Seba deštrukčné prispôsobovanie si a využívanie pracovnej sily, mestskej infraštruktúry, priestoru a environmentálnych externalít:** Seba deštrukčným ho nazývame preto, lebo cena zdravia a vzdelávania, mestskej dopravy, súkromných či komerčných nájomov, ako aj cena extrahovania zdrojov z prírody vzrastá v momente, ak sa súkromné náklady zmenia na sociálne náklady (O'Connor, 1988). Inými slovami, čím menej sa externé náklady produkcie (ako napríklad dopravná infraštruktúra, dopady na životné prostredie alebo sociálne dopady) premietajú do ceny výrobku, tým je výrobca/developer/investor ziskovejší.

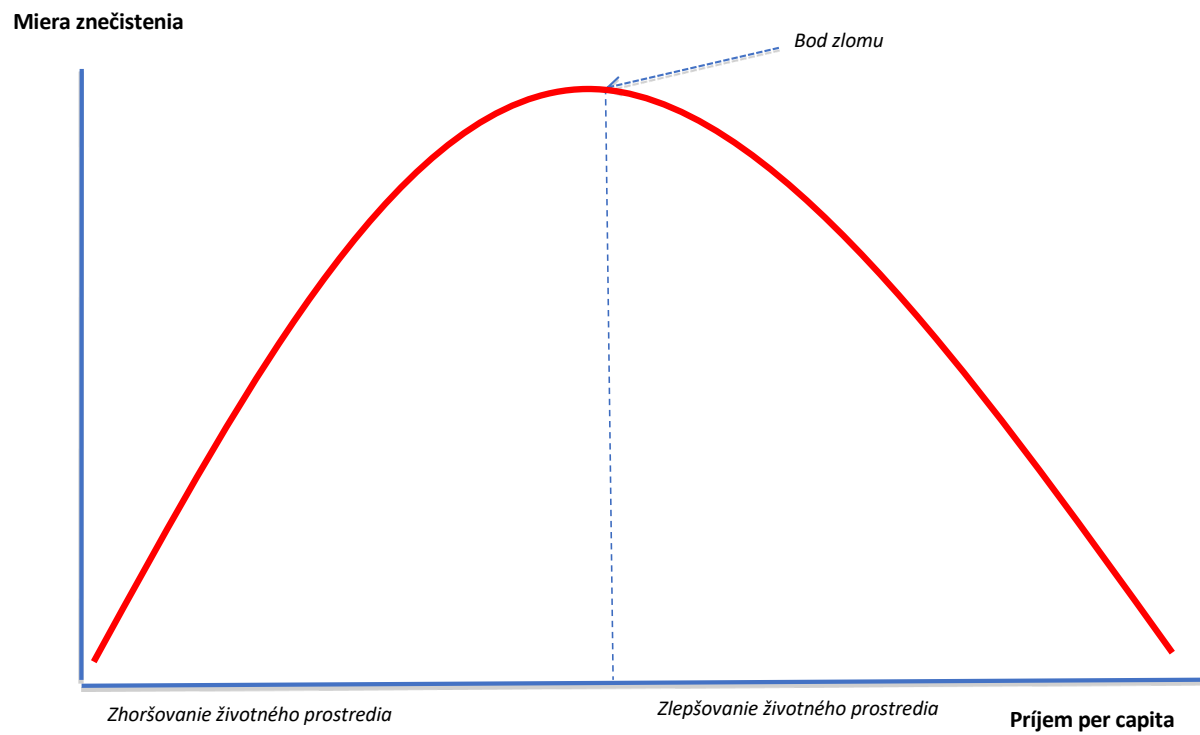
## Globálne výdavky strednej triedy a odhad do roku 2030 (V miliardách USD hodnoty 2005 v parite kúpnej sily)



Zdroj: Spracované podľa údajov Homi Kharasa (Kharas 2010).



## Kuznetzová environmentálna krivka



- Príklad Švédska: Emisie CO<sub>2</sub> sa od roku 1990 znížili približne o 27%  
Keď však zahrnieme index celkovej spotreby (dovážaný tovar vyrobený mimo krajiny) a medzinárodnú leteckú a námornú dopravu (ktorá v oficiálnych medzinárodných hláseniach nikdy nie je zahrnutá), potom sa nárast v týchto troch kategóriách vyrovná všetkým zníženým emisiám vnútri švédskych hraníc. Takže emisie Švédska v skutočnosti vôbec neklesli...



## 1. Príprava a metodológia

MŽP SR, SAŽP, ŠOP SR, Prognostický ústav CSPV SAV, UKF Nitra, ÚKE SAV, PBL NL

## 2. Vypracovanie scenárov

3 workshopy, 90 expertov - rezort ŽP, pôdohospodárstva, dopravy, SAV, univerzít, MVO

## 3. Analýza scenárov

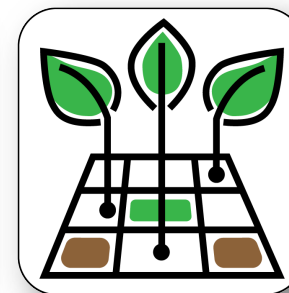
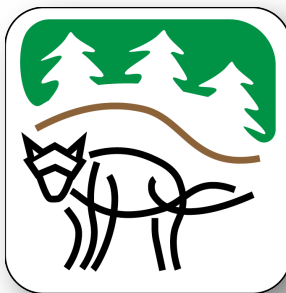
SAŽP, MŽP SR, SAV, UKF

## 4. Využitie a komunikácia



*0. Základný scenár: Vývoj v rámci súčasných trendov  
(Business as Usual)*

- 1. Tradície. Príroda ako zdroj kultúrnej identity*
- 2. Biodiverzita. Návrat k divokej prírode*
- 3. Ekonomika. Príroda v prostredí voľného trhu*
- 4. Inovácie. Smart využitie ekosystémových služieb*



## Vývoj v rámci súčasných trendov (Business as Usual)

- **príroda v roku 2050, ak by pokračovali súčasné trendy** (neustály pokles biodiverzity, neplnenie cieľov, potreba transformačných zmien)
- globálne sa oteplí sa o viac ako 1,5 °C už v roku 2040

Slovensko:

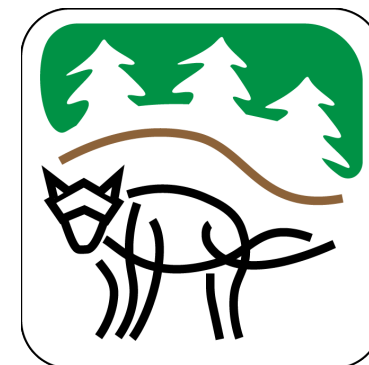
- lokálne úspechy (obnova časti degradovaných ekosystémov do r. 2030)
- kritický stav opel'ovačov
- zvyšovanie vplyvu zmeny klímy, klimatické extrémny (napr. sucho)
- biopotraviny vs. intenzívne poľnohospodárstvo
- prírode blízke obhospodarovanie, premena lesov v druhovej skladbe, privatizácia
- invázne druhy
- negatívne javy v krajine, vzorce spotreby
- zníženie počtu obyvateľov Slovenska, odchod z vidieka, urbanizácia v okolí veľkých miest

## 1. Tradície. Príroda ako zdroj kultúrnej identity



- kultúrna identita obyvateľov (identifikácia s miestom, kde žijú, spoločnosť oceňuje tradičné typy kultúrnej krajiny, iniciatíva miestnych komunít, občianskych skupín, farmárov a podnikateľov)
- obnova a rozšírenie charakteristických krajinných prvkov
- renovácia kultúrnych prvkov a pamiatok v krajine
- lúky a pasienky s pasúcim sa dobytkom alebo ovcami dotvárajú typický krajinný ráz
- spoločnosť oceňuje tradičné typy kultúrnej krajiny – majitelia pozemkov dostávajú podporu na ich zachovanie
- regionálne orgány vytvárajú podmienky, krajina je považovaná za verejný statok

## 2. Biodiverzita. Návrat k divokej prírode



- význam vnútornej hodnoty prírody
- dostatočný priestor pre prírodu a čas na prirodzený vývoj
- celospoločenská zmena hodnotových orientácií a rozvojových cieľov
- odolná príroda ako predpoklad zmiernenia účinkov zmeny klímy
- v EÚ aj na Slovensku vytvorená a múdro spravovaná sieť prírodných území
- rozvoj ekoturizmu (pozorovanie prírody), udržateľného lesníctva, rybárstva a poľovníctva
- manažment území - rôzne skupiny spoločnosti (štátna správa, samospráva, MVO, biznis)
- mimo siete intenzívne využívanie (poľnohospodárstvo, lesníctvo)
- veľké finančné náklady a obmedzenia hospodárskych aktivít

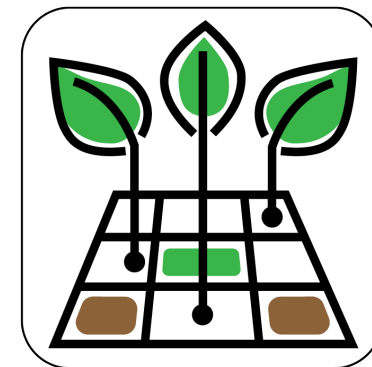
### 3. Ekonomika. Príroda v prostredí voľného trhu



- voľné pravidlá pre vlastníkov a užívateľov, limitovaná environmentálna legislatíva a nízke regulácie v oblasti ŽP
- súkromné vlastníctvo, osobná sloboda v spravovaní prírody
- štát a samospráva - základná sústava chránených území, zvyšok - súkromné spoločnosti, MVO, verejnosť
- príroda ako zdroj hospodárskeho rastu, ekonomické ukazovatele tlačia hospodárske subjekty na efektívnejšie využívanie surovín, získavanie príjmov pre spolufinancovanie OP
- členské alebo vstupné poplatky do CHÚ, parkov
- efektívne poľnohospodárstvo a lesníctvo, privatizácia lesov, biopotraviny vs. intenzívne poľnohospodárstvo
- dôraz na produkčné ES



## 4. Inovácie. Smart využitie ekosystémových služieb

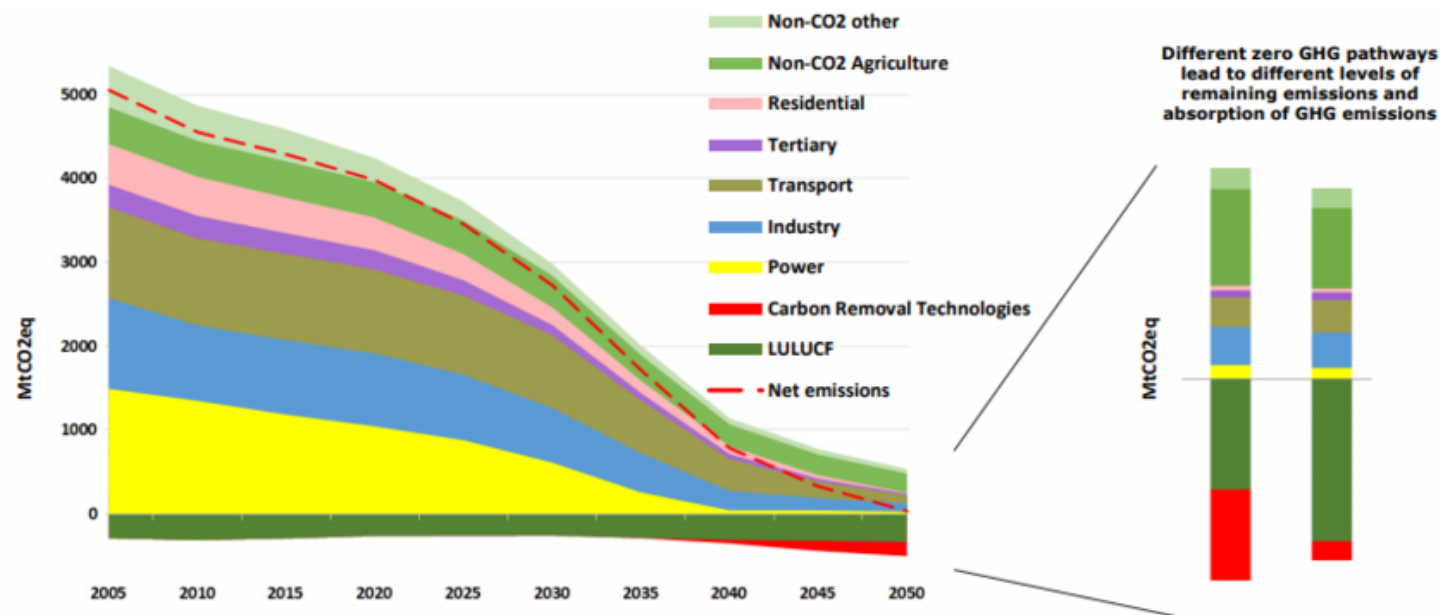


- transformatívna, celospoločenská zmena z konzumnej na zelenú
- zelené inovačné siete, využitie rámca ES, ochrana prírodného kapitálu
- príroda – rôznorodá, poskytuje rôzne služby
- problematika ŽP má nadrezortné postavenie, je integrovaná
- dlhodobá a kontinuálna starostlivosť o CHÚ, prepojenie biokoridormi
- lesy - prírode blízke obhospodarovanie, agrolesníctvo (adaptácia na ZK)
- poľnohospodárstvo – ekologické má významný podiel; prírode blízke riešenia a agroekologické postupy, agroinovácie
- úbytok biodiverzity a degradácia ekosystémov sa postupne stabilizuje
- v mestách: vegetácia a vodné prvky, dažďové záhrady, zelené strechy
- scenár predpokladá, že priemerný nárast globálnej teploty na konci 21. storočia nepresiahne 1,5 percenta

Table no. 1: Key characteristics of scenarios

Area	BAU. Business as usual	Traditions. Nature as a source of cultural identity	Biodiversity. Return to wild nature	Economy. Nature within a free-market environment	Innovations. Smart utilization of ecosystem services
General tendencies	There will be no significant changes or reversals in people's current economic and social trends and priorities. They may speed up or slow down.	Cultural identity and higher identification of people with the place where they live. The society appreciates traditional types of cultural landscape. An initiative of local communities, civic groups, farmers and entrepreneurs who are creating the natural environment.	The importance of intact (wild) nature for individuals and companies; it is conditioned by a society-wide change in value orientations and development goals and also brings major changes in land use throughout Slovakia.	Anthropocentrism. Nature is subordinated to economic interests. Nature protection is governed by the calculation of economic costs and benefits, the application of market principles and economic instruments.	Sustainable use of nature and ecosystem services. The society is greener and more sustainable, invests in research and innovation and takes into account external costs related to production and consumption.
Society and Institutions	The EU remains a world leader in the environmental issues. The Ministry of the Environment is gaining in importance and competencies. Increasing social and adaptation costs associated with climate change and environmental degradation are putting pressure on public budgets. Demographic trends and growing social polarization are leading to a further rise in populism and radicalism.	High involvement of local communities, local action groups, NGOs, increased support for nature by local governments. Local patriotism, the positive attitude of the inhabitants to the places where they live as a response to globalization. National and EU authorities are removing obstacles to such initiatives while co-financing them.	Higher form of environmental awareness. Very high participation rate and very important role of local partnerships (NGOs, associations, local government). Regulatory and control role of state authorities and European institutions. New setting of economic instruments, increasing the share of public land (state and municipal ownership).	The EU, the state and the local government give only basic regulations in the environmental field. To compensate for the dominance of economic approaches, a much higher level of participation of the population and NGOs and their environmental awareness or responsibility is needed.	The trust of the whole society and of economic actors that a transition to a green, climate-neutral economy is possible and desirable. The way of use of natural resources has fundamentally changed. The shift from a consumer society to a aware sustainable one, characterized by simple living at various levels (EU, Slovakia, regions and the local level), a paradigmatic shift towards a holistic approach.
State of nature In 2050	Biodiversity targets were not achieved. In Slovakia, some degraded ecosystems have been restored in some areas and the system of protected areas has been simplified. However, there is continuous unsustainable pressure on use of nature and resources. Adaptation to climate change is only partially successful and at a high cost.	Support of nature conservation and accessible nature to people. In addition to natural and semi-natural habitats, there are also cultural and historical elements with the accompanying green and blue infrastructure. Protected areas are attractive to humans for their genius loci. Extensive rural management contributes to halting the negative trend of declining biodiversity and improve conditions for pollinators.	The area of natural areas has increased, with an emphasis on the conservation and restoration of biodiversity. Landscape revitalization and restoration of ecological connectivity using the concept of green and blue infrastructure. New conflicts (human-wildlife/large carnivores, psychological factor, safety of the population, transport, etc.).	Only the necessary regulations in the field of biodiversity, the state provides and finances a minimum system of protected areas belonging to the Natura 2000 system. The rest of the natural areas are in private hands or managed by civic initiatives and numerous NGOs. Admission to national parks, nature reserves, but also private city parks is paid.	Nature is sustainable used and provides services for the benefit of present and future generations. Nature is diverse and functional. The extent of natural areas has increased and their function is primarily to meet local demand for ecosystem services. It is ingenious to build green and blue infrastructure. Owners and users are actively involved in nature conservation.
Land use	Unsustainable pressure on the exploitation of natural resources (forestry, agriculture, industry, energy production, tourism and services) result in irreversible changes in most territories.	Emphasis on the use of natural resources in accordance with the principles of sustainable development, the creation of new habitats, the construction of green and blue infrastructure.	Great contrasts, polarization of the territory into a natural and intensively economically used landscape. Larger share of natural and semi-natural areas, increased risk of intensive degradation processes in the surrounding country.	A country more affected by economic activity. The share of natural and semi-natural areas in the country is lower. Privatization of land and its economic use	Using the landscape in a sustainable way, thanks to which nature provides a variety of ecosystem services. Strengthening ecological connectivity between natural areas, as well as the country's resilience to climate change.

<b>Demography</b>	Slight decrease and ageing of the population in Slovakia. Concentration of productive population in urban agglomerations, rural depopulation.	People's interest in living in the countryside will increase.	Different demographic and social structure of the countryside (space for alternative communities, but also the risk of depopulation and marginalization of certain areas with accompanying socio-economic problems).	High concentration of the population in urban areas, depopulation of the countryside as economically insufficiently productive.	The slowing trend of productive population concentration in urban agglomerations, rural areas remain viable.
<b>Economy</b>	A market economy with a shift to a service-based economy and the outsourcing of most industrial production and parts of services. Material efficiency, shift to waste minimization.	Economy based on circular principles, aimed at supporting local production. In accordance with the BAU, the material efficiency of production processes will be increased and waste production will be minimized.	Significant transformation of the management in natural areas. Other areas used more intensively, with a less diverse economic structure. Problems with food security, wood and other raw materials.	Strengthening the economy and its transformation nationwide. Focusing on economic profit with its maximization and thus with the risk of negative impact on the landscape and the environment.	Transition to a green, circular economy. Production and consumption will use optimally the services provided by nature and minimize their impact on the environment. Strong emphasis on innovation and new technologies.
<b>Agriculture</b>	Contradictory trends: shift to organic production (weaker) and shift to large-scale food production (stronger). Lifestyle changes, the outflow of people from the countryside and the agricultural landscape. Rising food prices due to changes in the global / European market, strengthened by the effects of climate change.	Increased interest in organic farming and organic production, improving the ecological stability of intensively used agricultural land.	Reform of the EU CAP, due to the emphasis on shift from large-scale food production and a significant strengthening of agri-environmental measures. Significant strengthening of organic farming in natural and transition areas, on the other hand increasing concentration of agricultural production in other areas.	Strong pressure to increase efficiency and maximize profits – intensification of agriculture in the open country. Emphasis on the provisioning ecosystem services as opposed to regulatory ones. Products of organic farming are luxury goods.	Support for biodiversity, widespread use of agroecological practices, transition to organic farming, use of precision agriculture.
<b>Forests and forestry</b>	Climate change fundamentally affects the species composition of forests, the share of accidental logging is increasing; fragmentation of forest complexes. Privatization and ownership concentration. The price of wood is rising. Conflict between production and non-production functions.	In accordance with the principles of sustainable forest management. Emphasis on adaptation measures to climate change, support for the creation uneven-aged forests and adaptation of the species composition of stands to changing conditions.	Climate change has a major impact, a large part of forest stands is left to natural development (non-intervention areas). Spatial changes in the location of commercial forests – the area of economically usable forests in natural areas is gradually decreasing, as a counterweight, new areas of silviculture are emerging. Decreasing productivity of a large part of forests – the trend of rising timber prices continues.	Opportunity for efficient timber production, with increasing application of the principle of ecosystem services and payments for ES. A significant part of the forests is privatized. Private ownership pushes for profit maximization, which is reflected in the intensification of forestry in the unprotected landscape.	Nature-based farming, agroforestry that will contribute to adaptation to climate change. Strengthening the resistance of forest stands, providing various ecosystem services, payments for ecosystem services, certification.
<b>Water and water management</b>	The south of Slovakia suffers from a severe drought. Deteriorated availability of water resources vs. increasing risk of floods. Increased content of undesirable substances and hardly decomposable chemical compounds.	New technological procedures aimed at improving the quality and retention of water in the landscape (support for agriculture and increasing biodiversity).	Drinking water sources are more strictly protected. Economical technologies and management methods are favored. Promoting water retention in the country.	Lack of water, new dams on rivers for hydropower production or irrigation.	Targeted building of blue infrastructure in the country. Massive investments in water retention in the country and its better use, eco-innovative solutions.



Zdroj: Európska komisia, A Clean Planet for All, 2019

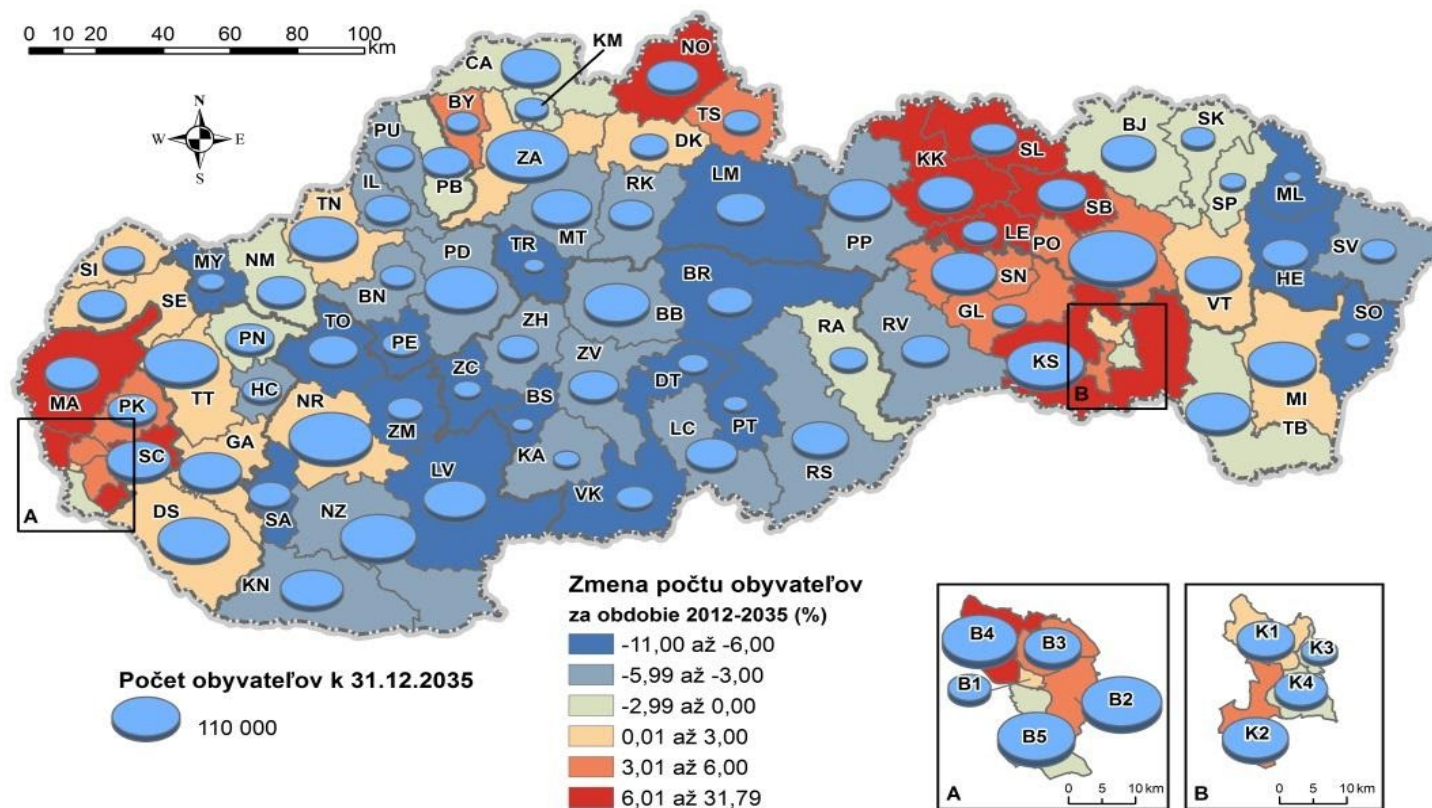


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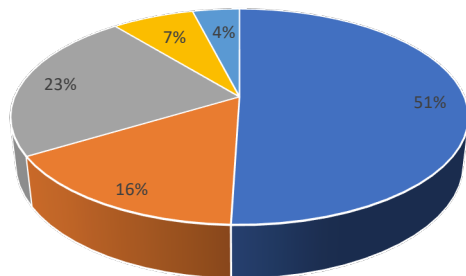
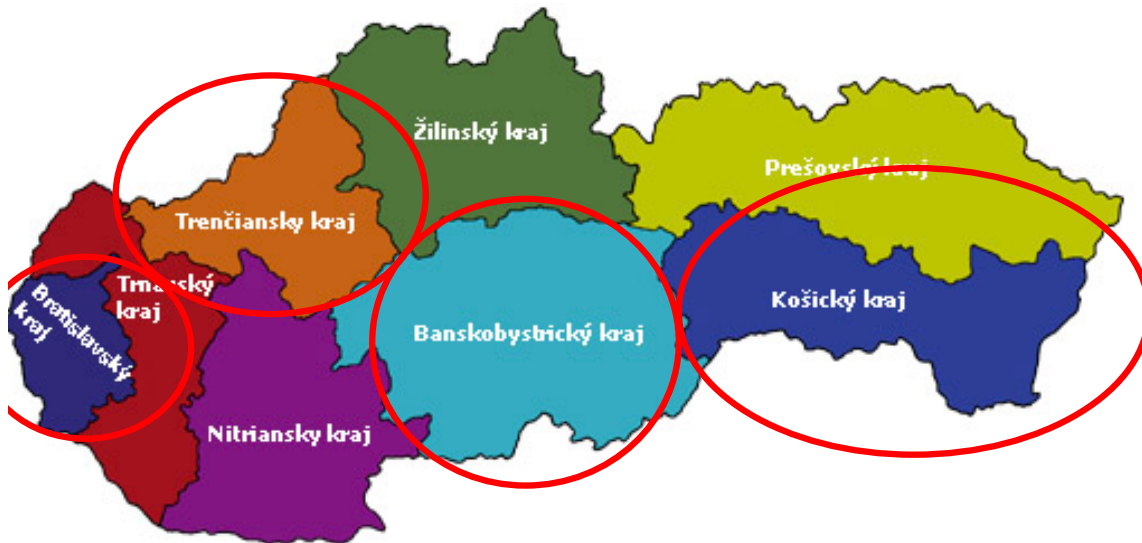
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Zdroj: Bleha et al. (2013)

## Dekarbonizácia na regionálnej úrovni

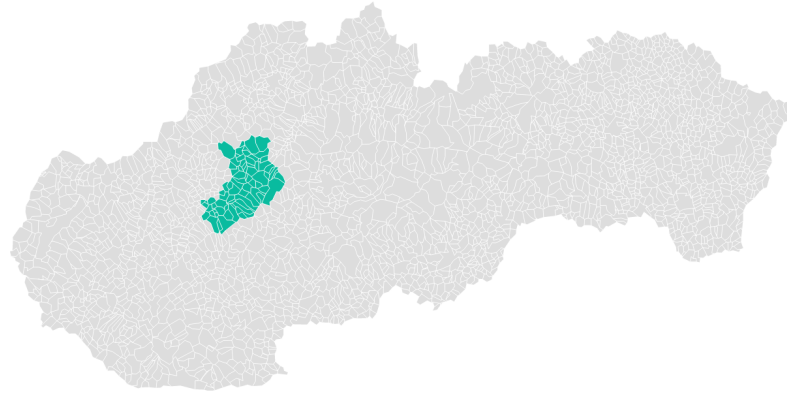


■ Energia (mimo dopravy) ■ Doprava  
 ■ Priemysel ■ Poľnohospodárstvo  
 ■ Odpadové hospodárstvo

- Mechanizmus spravodlivej transformácie (JTM) s cieľom dosiahnuť klimatickú neutralitu EÚ do roku 2050. JTM pozostáva z troch pilierov: Fond spravodlivej transformácie (JTF), schéma spravodlivej transformácie v rámci InvestEU a úverový nástroj verejného sektora.
- Existuje jasná potreba podporovať najzraniteľnejšie územia a regióny v Európe a poskytnúť im potrebné nástroje a vedomosti, aby bola ich zelená zmena úspešná
- 4 vybrané kraje a príprava Akčných plánov (konkurencieschopnosť, zamedzenie uhlíkových únikov, OZE a EE)
- Súčinnosť a synergie medzi plánovanými prístupmi a zdrojmi financovania (PD a JMT, Národný integrovaný reformný plán)

## Carbon Territories in Upper Nitra

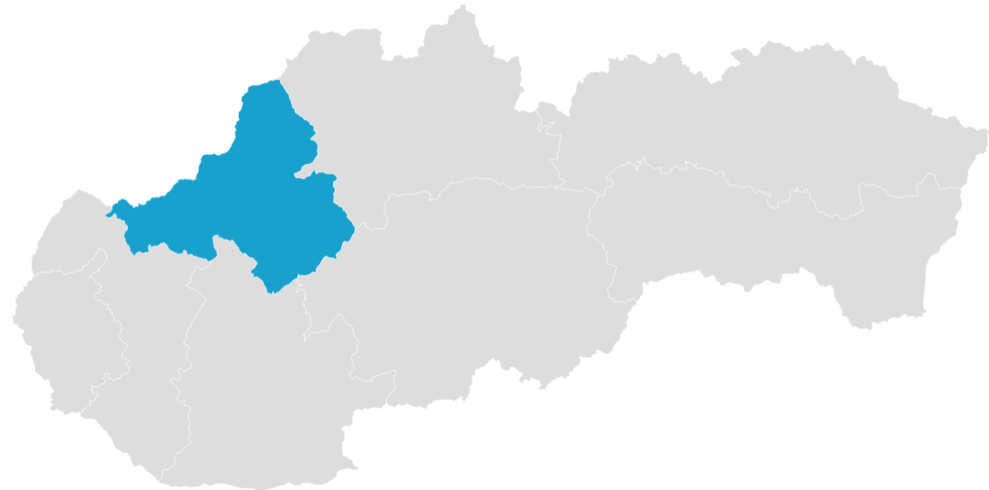
■ CCT



Map data: ZBGIS® • Created with Datawrapper

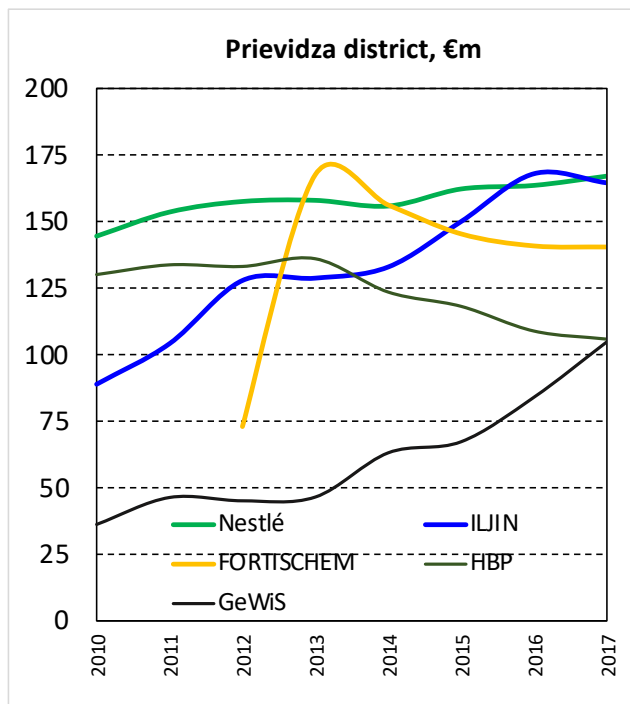
## Labour Market Area in Upper Nitra

■ LMR

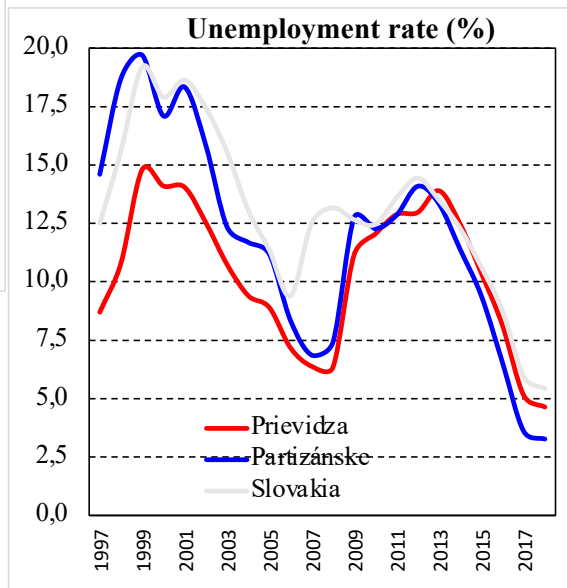
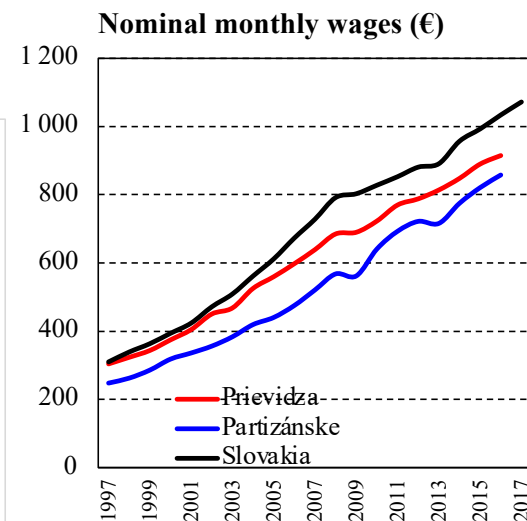


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Source: Statistical Office of the Slovak Republic and author's computations



## Upper Nitra: A Good Slovak Standard

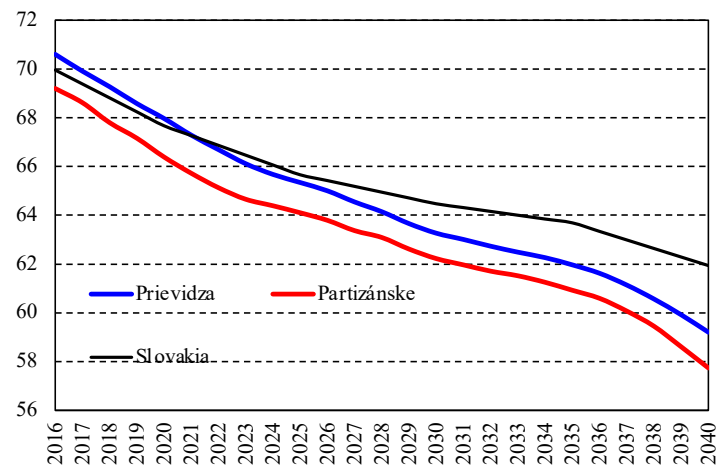
Revenue of the HBP coalmine declined by 19% in period 2010-2017. Other major employers, however, significantly expanded their revenues in the abovementioned period in the Prievidza district. Foreign-owned firms (Nestlé, GeWiS, Iljin) in particular were able to develop their business. Major regional employers expressed positive expectation about their future business development.

The decrease in unemployment rates was primarily fuelled by an economic boom and increase in total employment in each district in period 2012-2019. Decrease in stock of workforce was a contributory factor to decrease in total unemployment

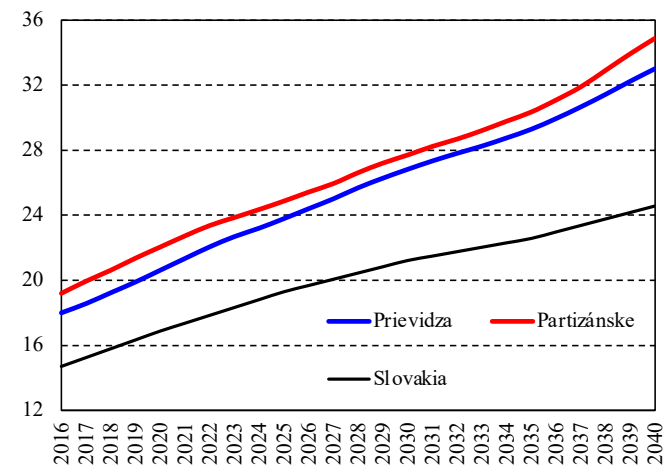
The demographic developments were responsible for about one quarter of total decrease in unemployment rates in period 2012-2017.

Regional employers coped with serious shortages of labour force since 2017. Some of them used services of job agencies and hired foreign workers to replace missing domestic labour

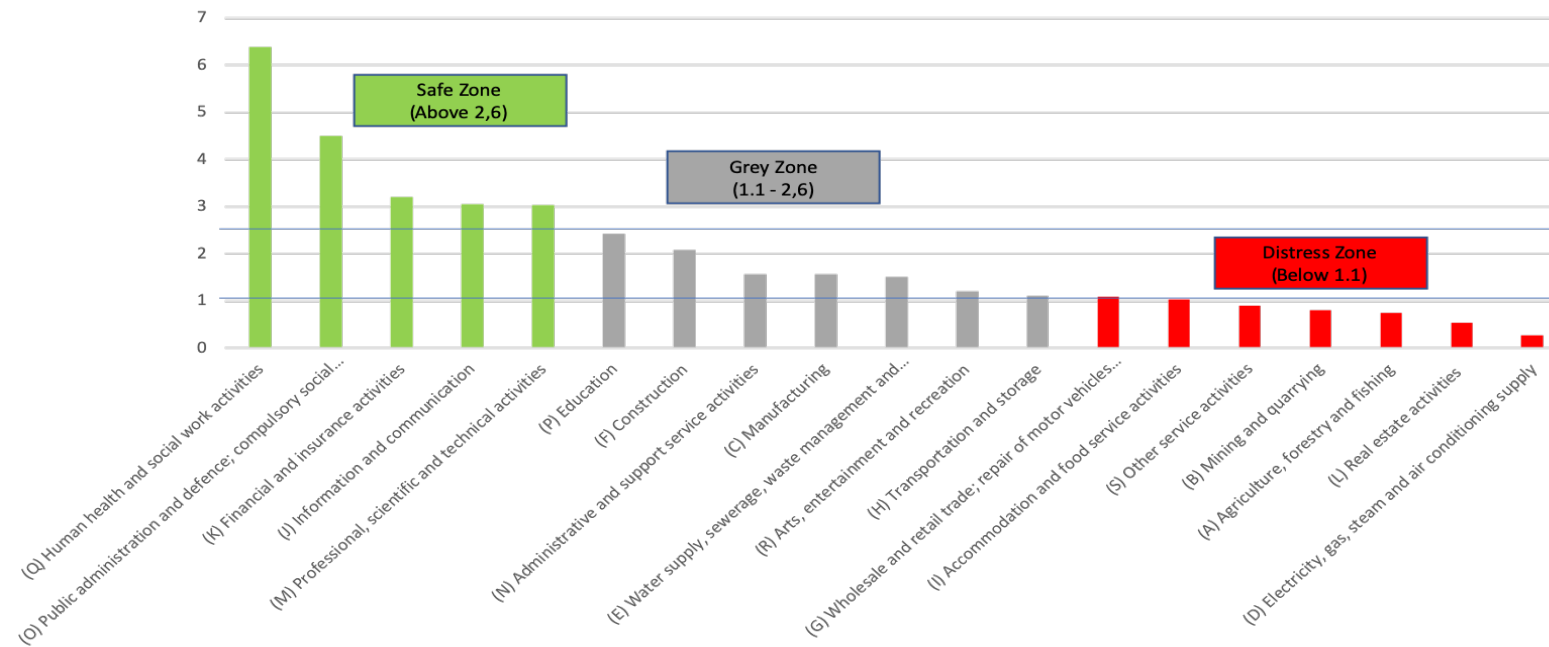
**Working age population (15-64) as % of total population**



**Elderly population (65 and over) as % of total population**



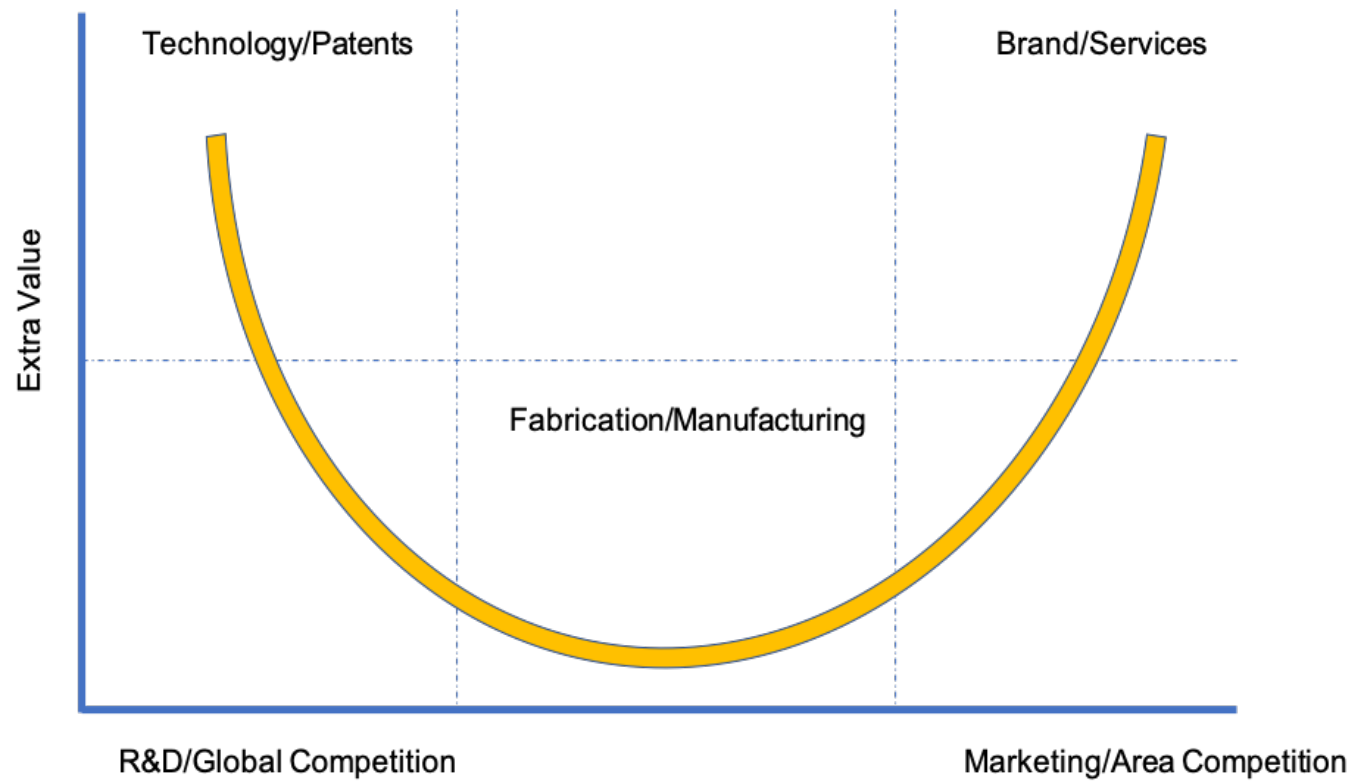
# SME in focus



**Note:** Altman's Z-score =  $0.717 * x_1 + 0.847 * x_2 + 3.107 * x_3 + 0.420 * x_4 + 0.998 * x_5$  (where  $x_1$  is net working capital / total capital (asset);  $x_2$  is retained earnings / total capital;  $x_3$  is profit interest and tax / total capital  $x_4$  is the equity market value (market price of shares) / foreign capital  $x_5$  is turnover / total capital)

## SME in focus

Section NACE Rev. 2	Number of enterprises			Revenue			Gross added value
	HN	Partizánské	Prievidza	HN	Partizánské	Prievidza	Slovensko
1-Cars for the 21st century	0,1	0,0	0,1	1,1	0,0	1,5	4,3
2-Industry for the 21st century	5,4	6,1	5,2	25,4	30,4	23,8	12,9
3-Digital Slovakia and Creative Industry	4,6	3,7	4,9	1,4	1,1	1,5	5,0
4-Healthy food and the environment	2,8	3,5	2,5	7,9	15,2	5,7	4,0
5-Population health and medical techn.	4,7	5,1	4,6	3,4	2,2	3,7	3,3
Industries outside the domain of smart specs.	82,4	81,6	82,7	60,7	51,1	63,8	70,5
Together	100	100	100	100	100	100	100



Source: Stan Shih, 1992.

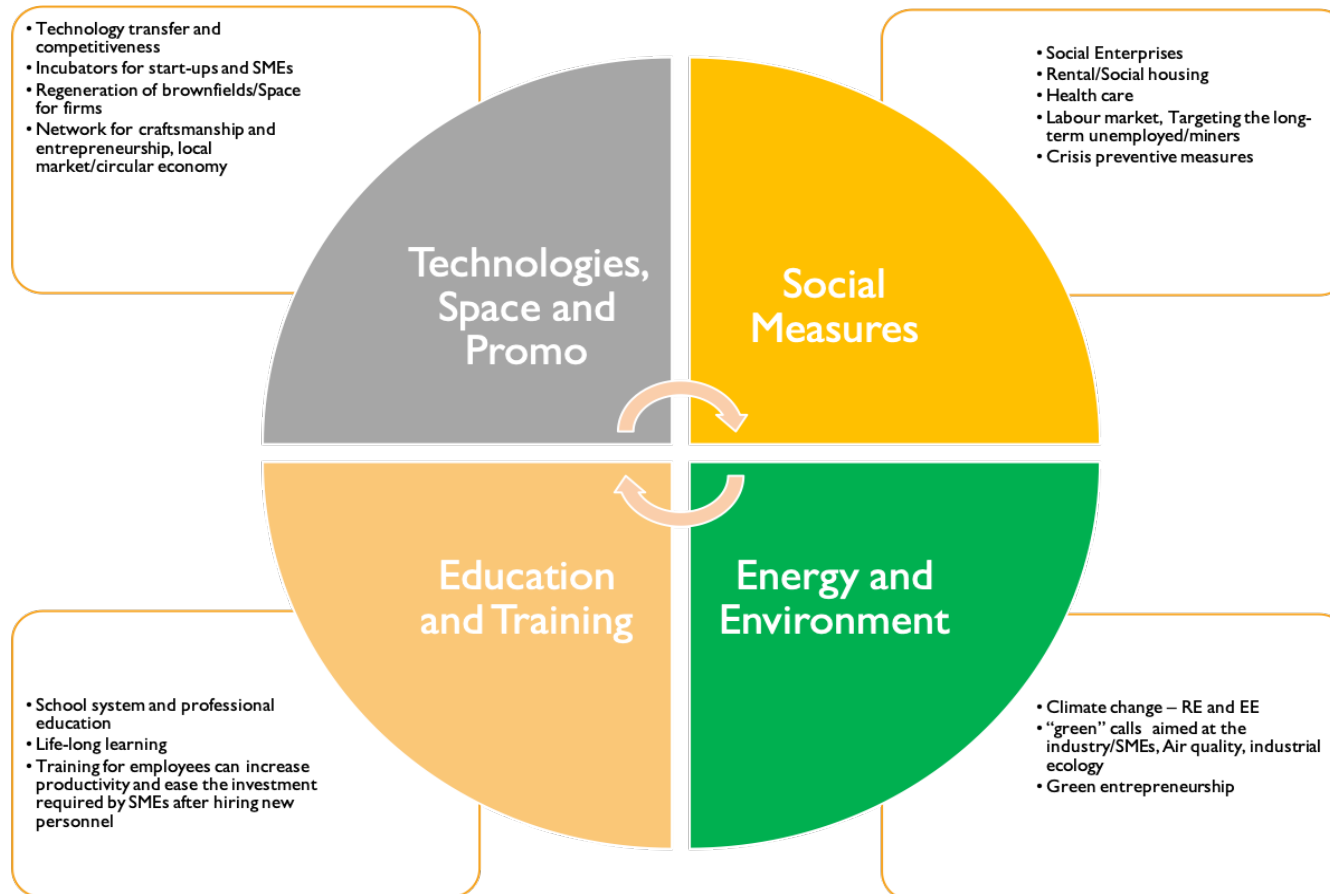
*“In next years I replace half of the people you see here [at the conveyor belt] with industrial robots”*

*“We do increase salaries, we need to keep our core staff...we do not plan to hire more people...it is complicated, not many available, those who want to work already work, the others are better to avoid”*

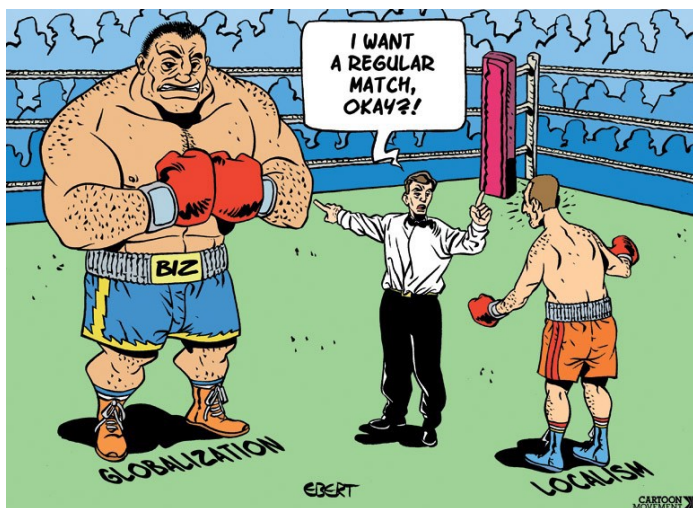
*“Our aim it to produce industrial robots that are dumb proof...you need zero qualification to operate them”*

*“Of course we face competition [on the labour market] ...big companies here or in Trenčín have better opportunities ... we try to attract people from abroad...no, we do not see potential in graduates from local schools, are there any willing to work in industry?”*

Personal interviews (SMEs CEO/Manageres and Owners  
Upper Nitra, 2019-2020.

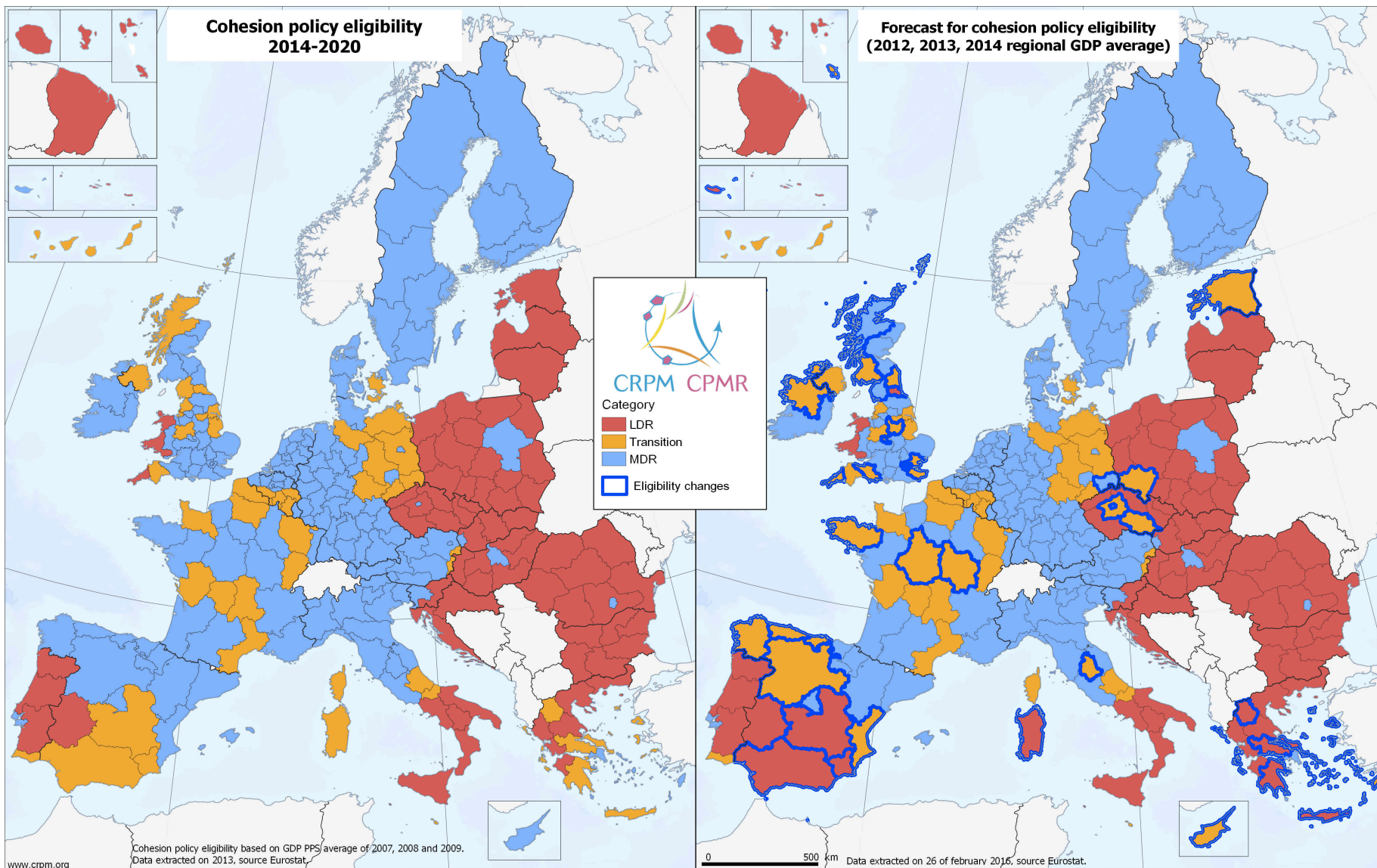


# Dekarbonizácia a niektoré implikácie

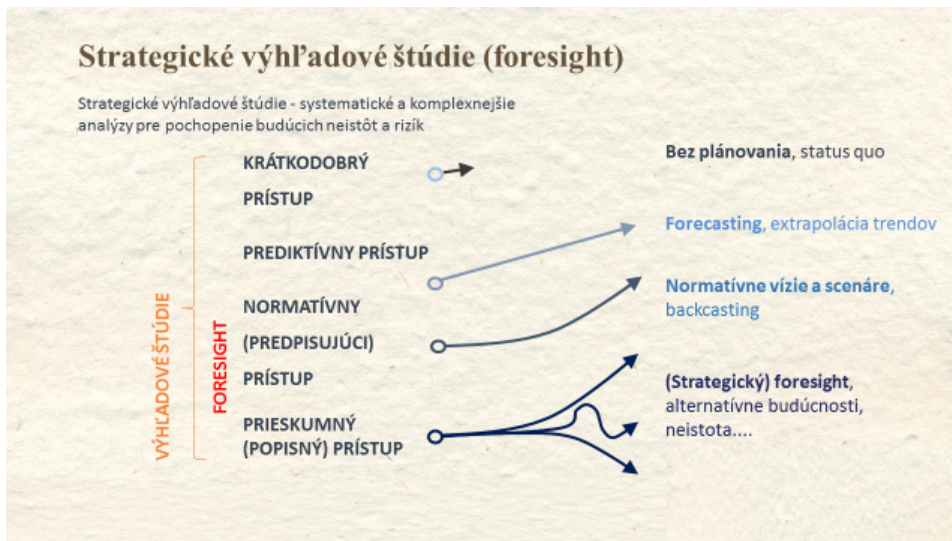


- Mýtus Goléma spútaného reguláciami a ktorého treba vypustiť sa v realite až tak nekoná
- Vízia smart transition a prax (Portugalské scenáre – IT Hub verzus turizmus)
- Dekarbonizácia a regulácie: Je to v dnešnej spoločnosti ktorej dominuje rastová paradigma a neo - klasická viera v deregulovaný trh vôbec možné?
- Je rast ako koncept stále aktuálny? (*Uneconomic Growth*), riadený pokles (*Degrowth*), koncept ekonomiky nulového rastu (*Zero Growth*) a rovnovážneho stavu (*Steady – State Economy*).
- Krajiny jadra verzus semi-periféria a periféria (Od Ricarda k Wallersteinovi)





# Scenáre 2050 a výzvy



- STRATEGICKÝ VÝHLAD – VYTÝČENIE SMERU K ODOLNEJŠEJ EURÓPE: EÚ a pravidelné výhľadové štúdie
- Dôležité factory (“Divoké karty” a disrupcie systému, problém “nízko vysiaceho ovocia”)
- Výsledky verzus proces



Obrázok: Banksy, Oval bridge, Camden, Londýn

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**Európska únia**  
Európsky sociálny fond

Tento projekt je podporený z Európskeho sociálneho fondu.



