

# POLICY BRIEF

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## RHINELAND, GERMANY



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## ENTRANCES PROJECT

ENTRANCES (ENergy TRANSitions from Coal and Carbon: Effects on Societies) is a three-year project funded by the European Union's Horizon 2020 research and innovation program. The project addresses the Social Sciences and Humanities (SSH) aspects of the Clean Energy Transition (CET) through the development of a theoretically based and empirically grounded understanding of cross-cutting issues related to social aspects of the transition in European coal and carbon-intensive regions and the formulation of a set of recommendations able to tackle these issues. To that end, 13 coal and carbon-intensive transition regions in Europe were studied using the same Multidimensional Analytical Framework (MAF), resulting in 13 case studies and an equal set of recommendations that reveal the complexity of the transition process and the impact in the daily life of local communities in its various dimensions.

## EXECUTIVE SUMMARY

This policy brief was developed under the Entrances Project and focuses on the results of the Rhineland Region case study.

Rhineland, located in the German federal state North-Rhine Westphalia, is home to the largest thermal power plant in the country. Lignite mining in the region dates back to the 17th century but gained prominence after the loss of hard coal deposits post World War I. Its importance grew until the reunification of Germany with the Rhenish mining area as the main source of coal. The region's power plants remain crucial for energy supply, but their contribution will decrease due to Germany's Coal Phase-out Act of 2020. The Act requires cessation of coal-derived electricity by 2038, impacting Rhenish mining significantly. A decision by the North Rhine-Westphalian state government marked the definitive end of coal mining in Rhineland by 2030.

As Europe's largest lignite mining territory, the Rhineland attracted numerous energy-intensive industries, boosting regional wealth and professional identity. However, the 2020 Coal Phase-out Act challenges this prosperity. The urgency for climate change mitigation has expedited the structural change policies timeline compared to the hard coal phase-out, putting significant pressure on policymakers and regional stakeholders. This Policy Brief reviews these challenges and proposes recommendations to inform policy decision makers.



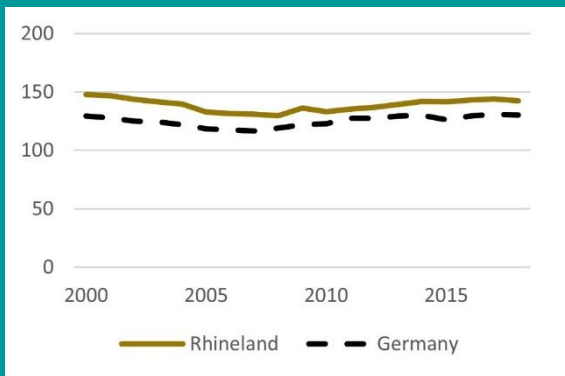
## Economic Situation

An important indicator of economic development is gross domestic product (GDP) per capita. GDP per capita can be decomposed into three components, i.e., labour productivity, the employment rate and the share of the population in working age.

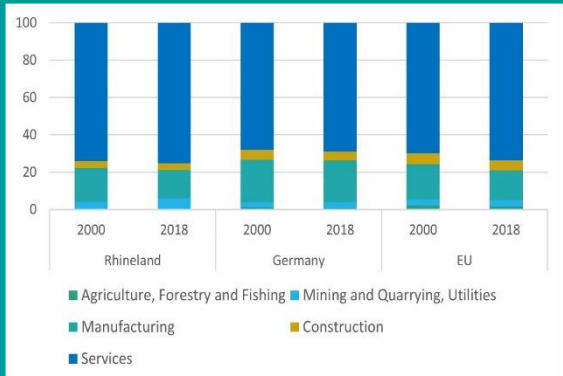
In 2000, Rhineland’s GDP per capita was 50% above the EU28 average. Until 2008 the GDP per capita in Rhineland converged slowly to the EU28 average, afterwards it started to diverge again. The share of utilities, mining and quarrying is above the German and EU28 level with 4% in 2000 and 6% in 2018. In contrast to other coal regions in Germany the share of services in Rhineland is greater compared to the German and EU figure, respectively.

Labour productivity in the Rhineland, after a decline from 2000 to 2013 relative to the EU average, has remained stable in recent years, around 20% above the EU average. Since 2000, the Rhineland population has grown by 5%, mirroring the EU28 population growth. Correspondingly, the working-age population (15-64 years) has remained relatively stable since 2014.

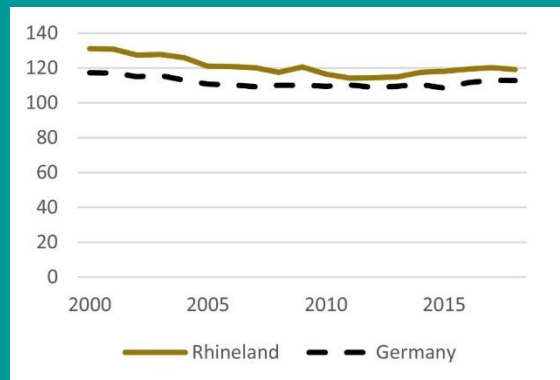
GDP per capita (EU28 = 100)



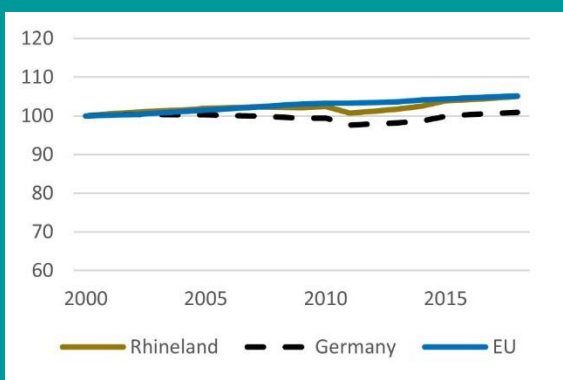
Economic Structure (Value Added Shares)



Labour Productivity (EU28 = 100)



Population (2000 = 100)



Note: Real gross domestic product is not available on a regional level. Therefore, the figures refer to nominal figures. The Census 2011 led to a break in the population series published by the statistical office of Germany from 2011 onwards.

Sources: Federal and regional statistical offices of Germany and Eurostat.

# INTRODUCTION TO THE PROBLEM

Following the German Coal Phase-out Act, discourse shifted from feasibility to the speed of the phase-out. Dominating conflicts include the pace of phase-out and usage of transition funds. Unlike other lignite regions, Rhineland's discourse emphasizes preserving nature and villages, with federal and state governments driving the region's coal phase-out.

The region aspires to be a hub of innovation and industry, ready to actualize the EU Green Deal and contribute globally to climate protection. However, challenges exist, including water scarcity, political polarization, and policy-implementation gaps. The energy system transformation and decarbonisation are anticipated to significantly affect residents' socio-psychological well-being, despite high levels of place rootedness and life satisfaction. Labour productivity surpasses national averages, and regional GDP growth mirrors Germany's, with migration being a key factor. The coal-fired electricity phase-out in North Rhine-Westphalia is historic and challenging, with the energy-intensive manufacturing industry's transformation expected to be the most severe one.

With this case study ENTRANCES explores the challenges faced by coal and carbon-intensive regions in transition, focusing on various socio-economic, socio-technical, socio-ecological, socio-cultural, socio-political, socio-psychological, and gender-related factors. It also examines the coping strategies that have emerged in recent years to address these challenges and investigates the variables that have influenced the emergence of deterritorialization and the strategies that determine its success using multidimensional analytical framework (MAF).

This policy brief aims to identify policies or policy combinations that would effectively restore territorial and community ties in coal and carbon-intensive regions while promoting their transition to clean energy.

## Key questions

**Key Question1.** What are the challenges faced by coal and carbon transition regions in different dimensions of change?

**Key Question2.** What are the emerging coping strategies and what policies could be more effective to address the identified challenges?





# METHODOLOGY:

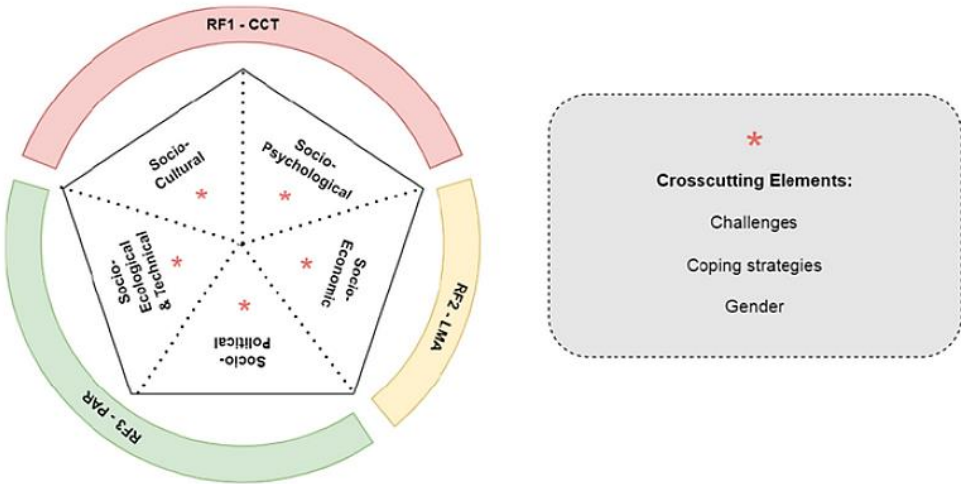


The ENTRANCES case studies were structured into multiple foci (Territorial Change, Structural Change and Clean Energy Transition) and respective units of analysis (Coal and Carbon Territory, Labour-Market Area and Political Administrative Region) to better address the scope of research. Additionally, a comprehensive Multidimensional Analytical Framework (MAF) consisting of five components: socio-cultural, sociopsychological, socio-economic, socio-ecological, and technical component, was adopted to study the complex and multidimensional dynamics in place.

Each component of analysis is supported by specific concepts and methodologies, as well as three cross-cutting elements: challenges, coping strategies, and gender dimension. The resulting challenges, as well as the gender dimension analysis, provide a very clear picture of the real situation in the region of analysis, accurately highlighting the problems related to the demographic, economic, social, cultural and political configuration. The initial results obtained from the different coping strategies generate new avenues for the discussion and recommendations presented in this policy brief.



## Overview of the Multidimensional Analysis Framework: Research foci, components and crosscutting elements





## CHALLENGES AND COPING STRATEGIES

### CHALLENGE 1



#### Energy Crisis

1

#### Clean energy transition

To decrease reliance on Russian gas, it's imperative to augment the proportion of renewable energy sources and expand storage facilities for surplus electricity generated from solar and wind power.

Currently, Rhineland has no sufficient storage facilities to balance out intermittent electricity production. Concrete plans are still missing.

2

#### Energy imports diversification

To diversify energy imports, a European electricity grid expansion is essential. It's also critical to foster trade relationships with diverse suppliers of natural gas and other fossil fuels.

Currently only electricity imports allow the usage of renewable energy imports in Rhineland.

3

#### Energy efficiency

Economic activity in Germany needs to reduce its energy intensity. Implementing and developing new energy technologies are vital to reducing the dependency on Russian gas.

Counties in the Rhineland have a relatively low share of district heating. There are potentials to improve energy efficiency using excessive heat.

#### RECOMMENDATIONS

- R&D into renewable energy and energy efficiency
- Invest in renewable energy infrastructure
- Establish storage facilities
- Incentivize private sector participation
- International best practices
- Expand geothermal energy and biogas
- European electricity grid expansion
- Negotiate bilateral and multilateral energy agreements
- Foster diverse trade relationships
- Increase use of district heating
- Harness excess heat
- Support education about energy efficiency

#### DISCUSSION

Rhineland's energy sector is faced with a predicament following geopolitical disruptions and escalating supply uncertainties. The region is diversifying its energy imports, expanding renewable energy sources, and fostering a hydrogen industry for a more resilient and sustainable energy system. However, these actions must consider their impacts on wealth distribution, particularly as demand-side coping strategies, like improving energy efficiency, depend on households' financial capacities, underscoring the complex challenges in transitioning towards a secure and sustainable energy future.



## CHALLENGES AND COPING STRATEGIES

## CHALLENGE 2



### Enhancing funding transparency and acceptance

1

#### Transparent rules for the acceptance of projects

The Zukunftsagentur Rheinisches Revier GmbH plays a crucial role in coordinating and guiding the process at the regional level. They assist project sponsors in preparing their proposals, conducting technical evaluations, and identifying suitable funding options. The decision-making process involves the establishment of a regional consensus by the supervisory board, which represents both the state and the region. The final funding decisions rest with the state government.

Currently the number of projects accepted in the Rhineland are the lowest among the three German coal regions.

#### RECOMMENDATIONS

- Publish protocols of the decision process
- Use a transparent scoring mechanism
- Harmonize and streamline the selection process
- Include local stakeholders (representatives of small businesses, public administration and unions)
- Regularly publish accepted and rejected projects
- Cooperate with public broadcasters
- Independent auditing

2

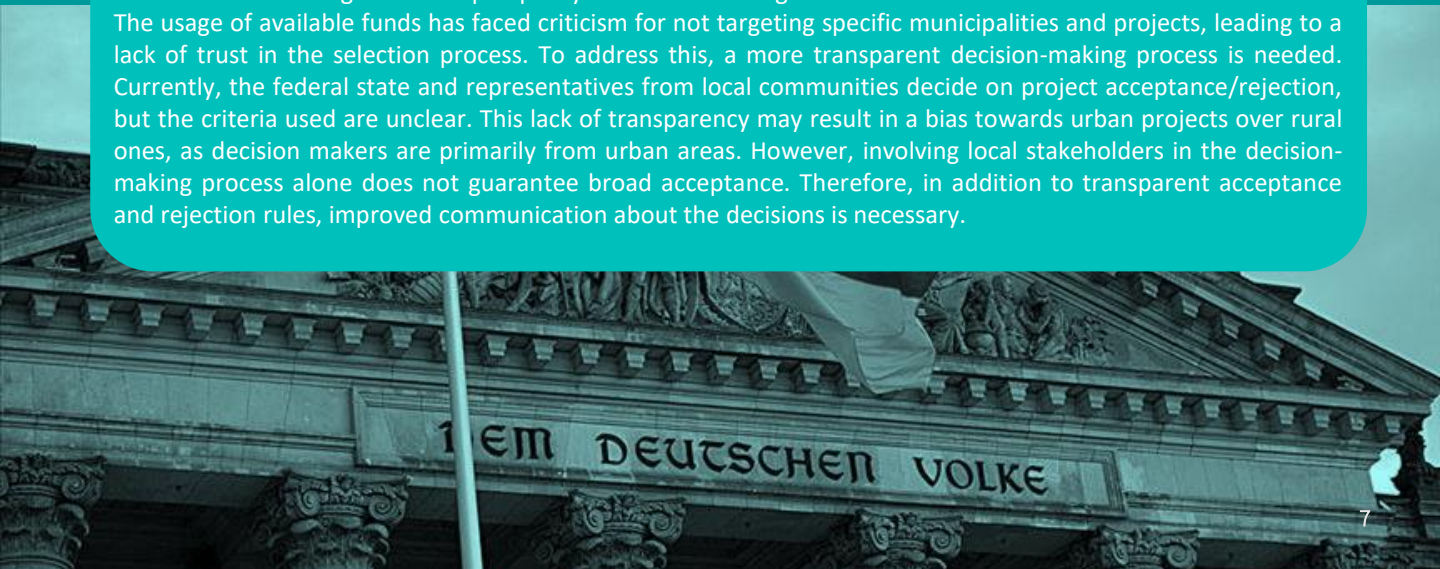
#### Transparent communication of accepted projects

The authorities' decisions to grant funding for various projects are often viewed as lacking transparency and justification. Stakeholders from the private sector, civil society and public administration complain about a lack of transparency in the project selection process.

#### DISCUSSION

The Coal Regions Investment Act is a legislative framework enacted in Germany to support the structural transformation and economic development of regions affected by the decline of the coal industry. The act aims to provide financial resources and assistance for the development of alternative industries, infrastructure, and job creation in these regions. It establishes funding mechanisms and support programs to facilitate the transition towards sustainable economic activities and the revitalization of affected communities. The Act recognizes the importance of ensuring a just transition for workers and communities impacted by the coal phase-out and strives to foster sustainable growth and prosperity in the affected regions.

The usage of available funds has faced criticism for not targeting specific municipalities and projects, leading to a lack of trust in the selection process. To address this, a more transparent decision-making process is needed. Currently, the federal state and representatives from local communities decide on project acceptance/rejection, but the criteria used are unclear. This lack of transparency may result in a bias towards urban projects over rural ones, as decision makers are primarily from urban areas. However, involving local stakeholders in the decision-making process alone does not guarantee broad acceptance. Therefore, in addition to transparent acceptance and rejection rules, improved communication about the decisions is necessary.







# CHALLENGES AND COPING STRATEGIES

## CHALLENGE 3



### Peripheralisation of rural municipalities

1

#### Creating a regional governance structure for education

Local governments and other stakeholders have progressively coordinated their education-focused responsibilities under numerous federal and state initiatives aimed at promoting local education monitoring. The Rhenish CCT has followed suit, creating an education monitoring bureau and preparing to address upcoming challenges stemming from the region's structural transformation.

2

#### Recreating rural municipalities as social places

While the phenomenon of urbanization in Germany has been a long-standing trend seldom disrupted, the central places concept played a vital role for states in balancing spatial development. This concept, deeply rooted in economic geography, recently evolved to suggest that small to mid-sized municipalities should also function as "social places", nurturing community activities and a civic political culture.

#### RECOMMENDATIONS

- Community involvement
- Inter-agency collaboration
- Transparent reporting
- Introduce regular evaluations
- Strengthen civic education
- Invest in public spaces
- Encourage entrepreneurship

#### DISCUSSION

Most rural areas are grappling with issues of outmigration and ageing. Combined with low population densities and rural municipalities' financial challenges, this could potentially exacerbate their marginalization. Prioritizing education and the establishment of "social places" is thus of utmost importance.







## Project Partners



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### Coordinator

[udc.gal](http://udc.gal)  
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Italian National Agency for New Technologies,  
Energy and Sustainable Economic Development

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