



ENTRANCES

ENergy TRAnSitions from Coal and carbon: Effects on Societies

POLICY BRIEF

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Kraków Metropolitan Area, Poland

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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 to focus on one of 6 carbon-intensive regions: the Krakow Metropolitan Area (KMA). Within the project, the KMA has been identified as an area where intensive use of solid fuels contributes significantly to high levels of air pollution, impacting the quality of life in the region. The problem of low emissions, stemming from the widespread use of classless coal-fired boilers, is further complicated by challenges related to territorial development and economic transformation.

The stakeholders surveyed during the project highlighted the urgent need to accelerate the replacement of furnaces, particularly coal and biomass boilers, in municipalities neighboring Krakow. Maintaining the current rate of furnace replacement will not allow the achievement of the goals set out in the anti-smog resolution for the Małopolska province. To significantly improve the air quality in the entire KMA region, approximately 23,000 household boilers still need replacement. Moreover, the residents of the KMA should prioritize investments to improve the energy efficiency of residential buildings. Integration of KMA's public transport systems and the expansion of agglomeration railways are also of key importance for decarbonization processes. Another set of recommendations concerns the problem of changing the regulatory system in order to reorganize the market for prosumer energy production and storage. Current regulations are less favorable for investors in renewable energy sources compared to previous frameworks. Furthermore, delays in the development of the transmission infrastructure hinder the ability of prosumers to connect to the transmission network. This Policy Brief reviews these challenges and proposes recommendations to address these problems in the KMA region.



INTRODUCTION TO THE CASE STUDY

Krakow, as a part of the Krakow Metropolitan Area (KMA), is one of Poland's oldest cities. Apart from its rich history, universities, and cultural institutions, the KMA has been a significant industrial centre for centuries.

In communes belonging to the KMA (excluding the city of Kraków itself), more than 50% of households still rely on hard coal for heating. Addressing the challenges related to burning fossil fuels requires decisive regulatory changes, not only in communes adjacent to Krakow but at the provincial or even national level. However, the ecological issues intersect with social and economic challenges. Factors such as low incomes, high heat and energy costs, and poor building energy efficiency have led to the energy poverty phenomenon in some households.

In this case study, ENTRANCES explores the challenges faced by KMA during its transition, focusing on a range of factors: socio-economic, socio-technical, socio-ecological, socio-cultural, socio-political, socio-psychological, and gender-related. The study also examines the coping strategies that have been developed and investigates the variables that influenced the emergence of deterritorialization. The success of these strategies is gauged using a multidimensional analytical framework (MAF).

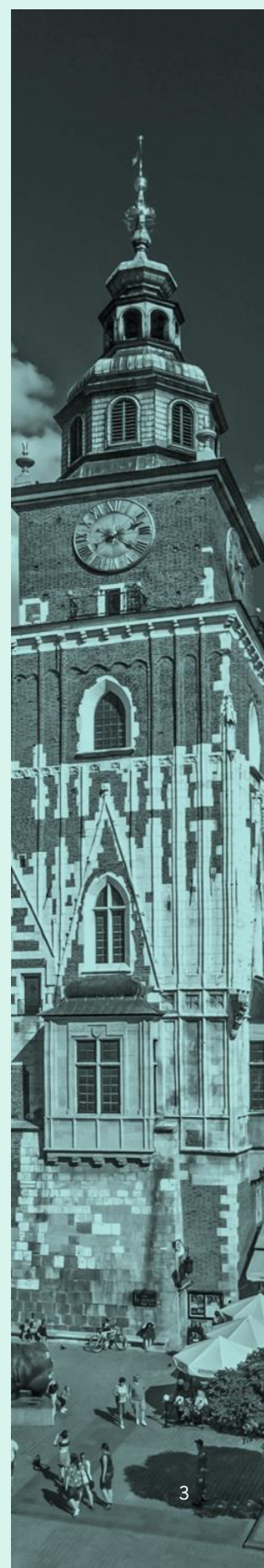
The examination of socio-political aspects reveals that local policymakers are more engaged in the transformation process than their national counterparts. The national government often introduces measures that implement European coping strategies in the context of the energy transition. In contrast, local resolutions often arise from grassroots initiatives. It's noteworthy, that the provincial government is dependent on the current ruling party, and also stands in opposition to the city administration.

The analysed case study, therefore, emphasizes the importance of the dilemma of whether the institutional system should prioritise adaptability to changing conditions in the energy market, or whether it should focus on the stability and predictability of the framework for all actors of the ongoing transformation.

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:

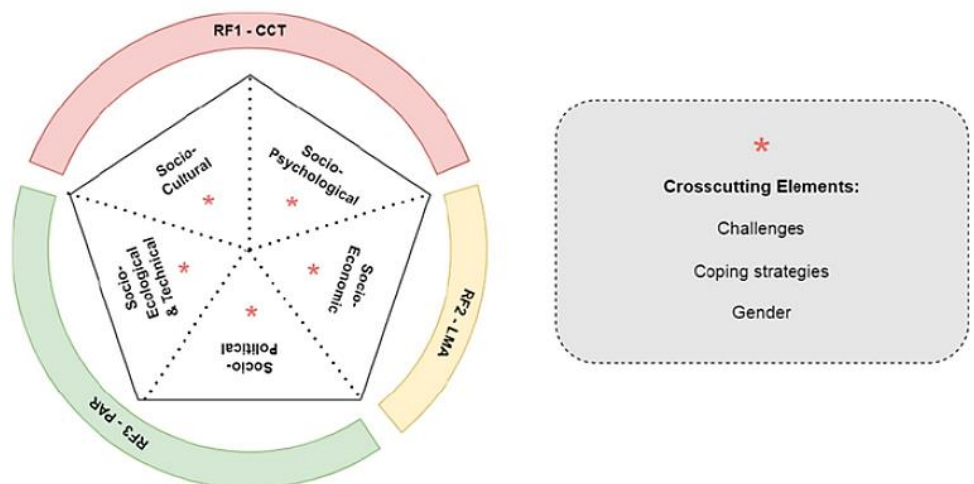


The ENTRANCES case studies were structured into multiple foci (Territorial Change, Structural Change and Clean Energy Transition) and respective units of analysis (Coal and Carbon Territory, Labour-Market Area and Political Administrative Region) to better address the scope of research. Additionally, a comprehensive Multidimensional Analytical Framework (MAF) consisting of five components: socio-cultural, socio-psychological, 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



Shrinking of urban greenspace

Main Challenge

Krakow is experiencing rapid urban development with a substantial increase in the number of apartments and modern office spaces over the past decades. Unfortunately, this growth has led to a decline in the biologically active green areas in the city. Between 2006 and 2021, the green areas decreased from 76.1% to 71.3%. This reduction in greenspace poses a significant challenge for the city's environmental health and quality of life for its residents. Research participants point to a major socio-political tension between residents who want to protect and revitalize green spaces and growing housing needs.

RECOMMENDATIONS

- Maintain the dynamics of creating new urban plans. The procedures for urban planning documents should involve significant participation from residents.
- Change the model for compensatory plantings, especially for public investments.
- Initiate and develop new investment programs on post-industrial zones, such as Rybitwy, Huta T. Sendzimira.

DISCUSSION

Under the existing legal framework, city authorities have the capability to safeguard green spaces and ensure city ventilation through appropriate provisions in planning documents. However, the protection of these green areas via new spatial plans clashes with the interests of landowners, making the process highly politicized and vulnerable to significant lobbying from investors.

A potential solution to this challenge could be to amend the main planning document, called the "Study of Conditions and Directions of Spatial Development." It is worth noting that despite conducting an analysis of the city's aerosanitary conditions and developing a concept for the city's ventilation system and air regeneration, these initiatives have not been incorporated into the current planning documents.





CHALLENGES AND COPING STRATEGIES **CHALLENGE 2**



Krakov as a pioneer of decarbonisation activities and related errors

Main Challenge

Krakov is recognized as a pioneer city in Poland, leading in dynamic processes of change and strong agglomeration development. The city has implemented several innovative initiatives, including the designation of the first bus lane, the construction of the first tram tunnel in Poland, and the introduction of the first public bike system in the country.

Since January 2023, the first clean transport zone has been operating in Krakow, which is a continuation of the pilot project that took place in the Kazimierz district in 2019.

Additionally, the city passed the first resolution in Poland banning the burning of solid fuels, which involved extensive planning and analysis before its implementation.

RECOMMENDATIONS

To address the lack of information and awareness of the inhabitants regarding the consequences of changes introduced, it is crucial to carry out extensive awareness and information campaigns. It is advisable to:

- Create community engagement forums where residents can participate and express their opinions on transformational policies.
- Implement a system of continuous evaluation and monitoring of decarbonization activities.
- Involve academic institutions and experts in the evaluation and decision-making processes

DISCUSSION

In the interviews and FGI meetings conducted for the ENTRANCES project, the respondents did not emphasize the significance of scaling transformational activities. Moreover, most respondents did not recognize the value of experimentations as a means of policy implementation.

Nevertheless, the respondents emphasized the importance of involving various groups and categories of residents in the deliberation process. According to most participants, representatives from various interest groups play an essential role in shaping policies. They also stressed the significance of increasing engagement and empowerment of various groups of residents at all stages of the transformation processes.



CHALLENGES AND COPING STRATEGIES

CHALLENGE 3



Intensive development of the KMA

Main Challenge

In recent times, there has been a significant surge in investments in residential real estate in both Krakow and the Krakow Metropolitan Area. Interestingly, this trend contradicts the demographic patterns observed in Poland's aging society, with Krakow being an exception and maintaining a positive demographic forecast. The ongoing process of demographic growth in the region has resulted in various stressors:

- A rise in passenger vehicle traffic leading to traffic congestion, increased emissions (especially secondary emissions), elevated noise levels, and a shortage of parking spaces.
- The development of housing estates on green spaces, negatively impacting the natural environment.
- Tensions and conflicts arising between long-time residents and newcomers due to the changes and developments happening in the region.

RECOMMENDATIONS

- Municipal authorities should collaborate with developers to incorporate parks, gardens, and green corridors into new housing projects.
- To encourage residents to choose sustainable commuting options, there is a need to expand the public transport network and improve access to public transport.
- To minimize tensions among residents, it is essential to promote mixed urban projects and involve the community in decision-making processes.
- Create a coordinated and cooperative program between Krakow and neighboring municipalities to tackle air pollution.
- Implement the Clean Transport Zone in Krakow to reduce the number of vehicles entering the city, especially those with increased emissions.

DISCUSSION

According to the study, the respondents highlighted the significant expansion of cities and the resulting consequences. One notable concern was the reduction of green spaces and the associated issues with city ventilation.



CHALLENGES AND COPING STRATEGIES

CHALLENGE 4



Conflict between Krakow and adjacent municipalities

Main Challenge

The city of Krakow is struggling with a significant air pollution caused primarily by the accumulation of pollution from neighboring communes. One of the main sources of air pollution is the use of solid fuels, such as coal and wood, for heating households outside the city. Additionally, the presence of 23,000 non-class coal and wood-fired boilers in the adjacent municipalities further exacerbates the pollution problem. Despite the efforts by the Lesser Poland Regional Assembly to replace class 3 and 4 boilers by the end of 2026, the slow pace of this process raises concerns about its effectiveness.

Moreover, internal combustion vehicles from neighboring municipalities contribute to the air pollution in Krakow. A substantial number of vehicles, approximately 246,000 per day, enter Krakow, of which about 40,000 transit through the city and 16,000 move through the city center.


RECOMMENDATIONS

In order to control these phenomena, it is necessary to:

- Establish a regional working group or committee to develop and implement joint strategies to improve air quality in the Krakow Metropolitan Area.
- Invest in public transportation infrastructure, such as agglomeration railways and Park&Ride systems, to provide viable alternatives to private car use.
- Ensure the timely implementation of road infrastructure projects, such as the northern bypass and expressways around the city.
- Conduct public consultations and awareness campaigns to educate residents about the importance of reducing emissions and their role in achieving cleaner air.
- Invest in ongoing research and data collection to monitor air quality and identify specific sources of pollution

DISCUSSION

The historical environmental conflict between Krakow and its neighboring areas has deep roots. The emissions from Huta Skawina or Nowa Huta (considered by many Cracovians to be separate from the city) have been a source of contention, as pointed out by participants of the focus groups. Currently, the conflict between municipalities and Krakow revolves around the issue of low emissions. Respondents highlighted tensions resulting from furnace emissions and the influx of vehicles from the agglomeration. Researchers, however, did not link this problem with the process of suburbanization in the city.



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