

## TRANSITION OF BUSINESS SECTOR IN THE COAL REGION ÚSTÍ NAD LABEM

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### Abstract

According to its proclamation, the government of the Czech Republic intends to discontinue the use of coal. The region of Ústí nad Labem faces a vast challenge with the transition to a low-carbon economy because of its high dependence on the lignite industry. The process of decarbonization and energy transition impacts businesses in many various sectors. Besides the implementation of sustainable development regulations, it is up to the businesses to develop their strategies of managing the transition.

Energy transition brings about substantial growth of costs for businesses. Businesses themselves search for options of how to reduce operating costs. In our paper we will discuss results of analysis of transition of business sector to low-carbon economy in Ústí region. Our paper will include general collection of data about significant businesses in the region. We introduce key indicators about the region, current situation of industrial businesses and the estimation of the extent of regulatory impacts to the businesses which are about to undergo strategic steps in order to prepare to transition to a low-carbon economy.

**Key words:** energy transition of business sector, low-carbon economy, decarbonization,

**JEL Code:** Q49, Q59

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### Introduction

The upcoming energy transition to a low-carbon economy in the European Union to meet the requirements of international agreements is inevitable. The so-called “low-carbon economy” is a term that is associated with a number of international challenges, with the regulatory changes, changes in the energy supply and consumption, changes in consumer behavior, transportation and many others. As some of the studies confirm, the decarbonization objective of the European Union is economically and technically feasible. Nevertheless, there is inevitable structural change to be made within the EU energy system. Models of the

Capros´ (2014) study draws the conclusion that to meet the decarbonization target is possible at a relatively modest cost, which shall be lower than 1% of GDP of the EU in the time period of 2010-2050 in cumulative terms. The energy transition to the 2<sup>nd</sup> half of the 21st century seems to be obtainable.

There are many different concepts that resolve energy transition to a low-carbon economy. On a municipal level, Jalil-Vega (2020) stressed the complexity of energy systems taking into account the whole spectrum of demand for electricity, heating, cooling, transport and the search for cost-effective pathways to meet the demand under low-carbon economy constraints, conditions of transition network and level of end-use technologies. The process of transformation may be seen even from other perspectives, either from complex national or regional perspectives or from a detailed sub-entities perspective. However, there is a gap in the recognition of regulatory impacts on the businesses which are about to undergo strategic steps in order to prepare to transition to a low-carbon economy.

Our research plan for this paper is to map to what extent the Northwestern Bohemia region will be affected by the transition to a low-carbon economy with its focus on the energy sector, heating sector, heavy industry sector and related businesses. In the beginning of the paper, we discuss the challenges to energy transformation in general and the current situation. The following chapter is devoted to the mapping of the Northwestern Bohemian region with its specifics and features. At the end of the paper, we will examine the current region's situation with an emphasis on the upcoming decarbonization processes.

## **1 The challenges and drivers of energy transition**

It is necessary to see the challenges to which the coal regions are about to face in the next few decades from a transnational and an international perspective which includes the implementation of regulations for climate protection.

Currently, there are already mechanisms like the emissions trading system, whose purpose is to remove the most notable sources of emissions. In the European Union, it is the European Union Trading Scheme (EU ETS). The price of emission allowances has been rising significantly for the last few years with the long-term average value. This price development increases the costs of businesses and pressures them to cross to cleaner and thus cheaper systems as well as sources of energy. In some cases, the rising price has caused production restrictions and in extreme cases, the termination of business operations because

the cost for reconstruction to cleaner sources is high. The EU ETS thus fulfils its primary function, reduction and elimination of dirtiest polluters.

Recently, other crucial regulations at the European Union level have been suggested which shall support regional transformation to a low-carbon economy because The European Union is supposed to adhere to international commitments and implement the necessary measures to contribute to solving global environmental problems. The European Union announced on the 11<sup>th</sup> of December 2019 the European Green Deal which is a package of policy initiatives carried forward by the European Commission with the main objective of making Europe's climate neutral in 2050 with its particular objective to increase the EU's greenhouse gas emission reductions target for 2030 to 55% compared with level in 1990. Emphasis of the theme at the European Union level and inclination to the decarbonization of Europe until 2050 is evident. The impact of energy transition to different European countries will depend on the degree of dependence on fossil fuels, its regional and social structure, government regulations, ability to adopt changes and many other aspects. Besides regulatory environment, each business shall have its own strategy how to react towards the changes.

The Government of the Czech Republic proclaimed its intention to discontinue the use of coal in connection with the introduction of the new energy plan of the European Union, European Green Deal. In 2019, the government established a Coal commission where experts' discussions take place which will lead to some final recommendations about the use of coal declination. The inspiration for the establishment of the Czech Coal Commission is the German Coal Commission. Recommendations shall include various possible scenarios of diversion from coal in the Czech Republic with an exact timeline schedule.

## **2. Energy transformation and literature discourse**

The path to economic transition does not affect every economic subject and region equally. Nowadays, there are developed methods (Fleming-Muñoz, 2019) for indicating which regions are likely to tend to structural changes on a greater or lesser scale. The impacts of energy transition are likely to occur in those regional economies that are substantially relying on carbon-intensive sectors. Especially directly affected local and regional carbon-economies shall develop policies and plans for the smooth transfer to a low-carbon economy.

Policy makers are especially interested in the macroeconomic consequences of the decarbonization process in order to opt for the proper procedure and regulation measures to support such an energy transition. They are often referred to as integrated modeling studies.

Fundamental modeling assumptions and uncertainties frequently remain invisible or unquestioned, even though they have the potential to determine the models' results (Bachner, 2020). In a cited study from Bachner, authors demonstrated the effect of different assumptions and layers of uncertainty which influence a models' results. The final model's result depend mainly on the choice of technology, regional characteristics and prevailing macroeconomic states. The model of choice influences the final macroeconomic effect and then it should be considered in the results interpretation by policy makers. The study concludes that macroeconomic impacts may be positive or negative depending on the relative expenditures to technology. This puts higher demands on policy makers to conduct proper discussions about the transformation and an even higher demand on businesses' executives to prepare their own strategies. The results show that the pathway to a low-carbon economy transition shall be developed for each region according to its specifics. Researchers see the transfer of regional case studies to other regions as being quite limited because of their specific nature.

There have been many other models developed and attitudes which concern the methodological approaches to decarbonization (Duan, 2020), evaluate the impacts on regions using case studies (Ko, 2020), take into account urban perspectives (Urrutia-Azcona, 2019), reflect changes in the energy sector (Berger, 2020), asses the impacts on the industry sector (Prado, 2020) and many other studies which concerns energy transition and the decarbonization theme. Even though there are many studies that deal with the structural, macroeconomic views on energy transition, there are only a few studies dealing with the transition from the perspective of a businesses like Tran (2019).

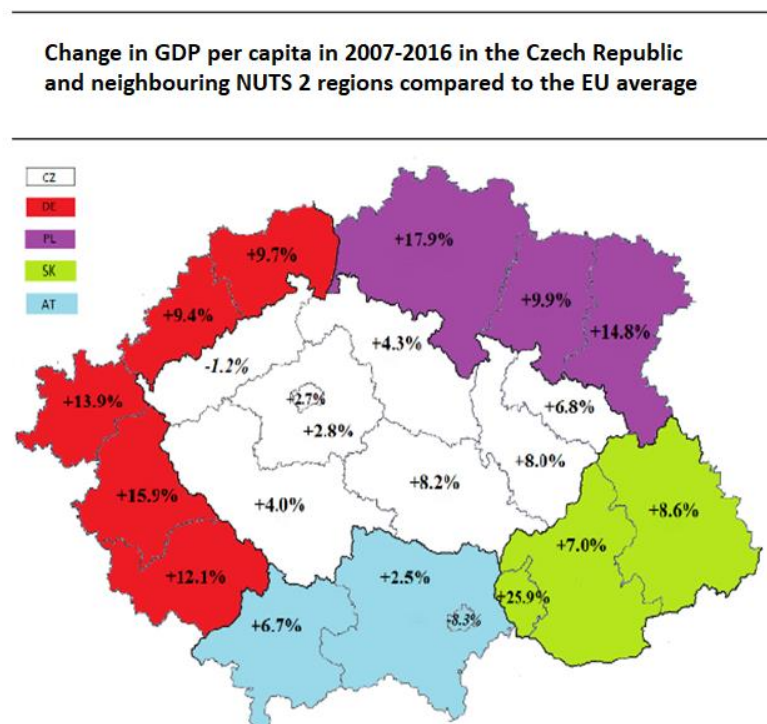
### **3 The challenges of the Northwestern Bohemian Region as a traditional coal region**

When analyzing the Ústí nad Labem region, it is reasonable to include the Karlovy Vary region because of its similar economic and social situation as well as its historical background. These regions are on paper referred to as the Northwestern Bohemian region. The Northwestern Bohemian region is specific as to its dense occurrence of heavy industry and vast lignite deposits. At the same time, it is a region where there are many social problems, excluded sites, rate of unemployment over the average in the long-run, brain-drain and other problems. As seen in figure 1, the Northwestern Bohemian region is the only region in the Czech Republic and the only region in its neighboring regions that had between the years of 2007 – 2016 a negative evolution of GDP. When all regions around were prospering,

the Northwestern Bohemian region was declining. It is a signal that something is malfunctioning in the region even in the times of general prosperity.

Energy transition in the Northwestern Bohemia Region is about to lead to a significant structural change. Businesses will have to face many challenges, like the necessity to implement new technologies and innovative solutions for business developments as well as the requirement to search for new business opportunities. Towards the transition, businesses have to comply with new environmental regulations. This means for a lot of them they will have to adjust their energy management and business strategy.

**Figure 1: Map of GDP change between the years of 2007 – 2016**



Source: Eurostat Regional Yearbook (2018)

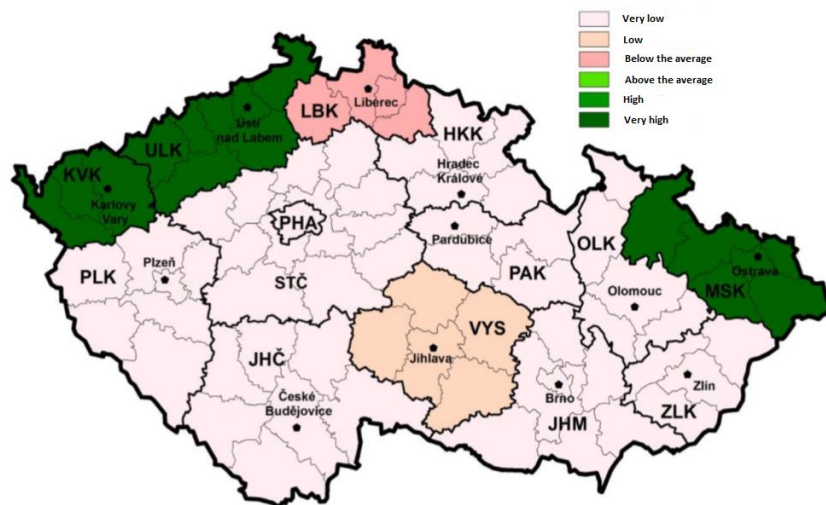
### 3.1 The Northwestern Bohemian Region and its socialist heritage

Energy transition is the actual theme in the entire Northwestern Bohemian Region. The region is traditionally an industrial area with a strong economic orientation towards heavy industry. Historically, the region specializes in the mining of minerals, especially lignite. There are mining companies, thermal power plants, coal heating plants, chemical industry businesses, production industry businesses, etc. Moreover, there are many other businesses which are secondarily bound together with the prime lignite mining sector, e.g. engineering, energy industry, etc. and other indirectly connected sectors.

A number of industries have declined or stagnated since the 1990s. There are many brownfields in the Northwestern Bohemian Region as a result of the decline. The environmental situation is improving, but there are still many ecological loads in the region. A substantial part of the region's economy is built on a smaller number of large companies, especially those in heavy industry, which are primarily dependent on coal (see Figure 2).

**Figure 2: Ratio of employees in the mining industry**

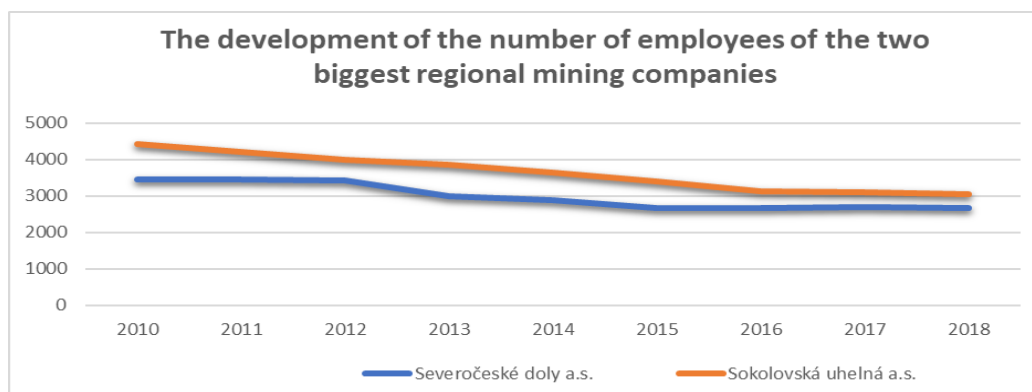
Ratio of employees in the mining industry sector in the region with respect to the total number of employees in the region



Source: Further Education Fund of Ministry of Labor and Social Affairs (2015)

There are three mining companies in the Ústí and Labem region, where the most dominant company is Severočeské doly a.s., In the Karlovy Vary region, Sokolovská uhelná, právní nástupce, a.s. is most dominant.

**Figure 3: The number of employees of the two biggest regional companies**



Source: Authors' compilation based on companies' annual financial statements

The Northwestern Bohemian region is specific for having a high number of people working in the mining industry. Together in 2015, 3,4% of all employed workers were employed in the mining industry in the Karlovy Vary region. In the Ústí nad Labem region it was 1,8%. The average in all Czech Republic was 0,8%. The overall employment rate of the people in the sector is obvious.

**Table 1: The ratio of employees in the mining industry throughout the regions in 2015**

Region	Portion in the mining sector	Employees in the region in total	Employees in the mining sector	Employees in the industry and construction sector
<b>Karlovarský</b>	<b>3,4 %</b>	<b>139.600</b>	<b>4750</b>	<b>54.000</b>
Moravskoslezský	3,1 %	540.500	16750	222.600
<b>Ústecký</b>	<b>1,8 %</b>	<b>351.000</b>	<b>6320</b>	<b>151.000</b>
Vysočina	0,6 %	231.500	1390	110,500
Liberecký	0,6 %	197.200	1180	92.800

Source: Authors' compilation based on data from Czech statistical office (2015)

It is not only the presence of mining companies in the region, it is the presence of the whole industrial structure dependent on coal which makes the Northwestern Bohemian region interesting to analyze. Currently, there are 266 facilities in the Czech Republic which are subject to the trading of greenhouse gas emission allowances. There are 44 facilities in the Northwestern Bohemian Region, which connects the region with some significant air polluters using fossil fuels more than on an average level of the Czech Republic. The average number of air polluters per NUTS 2 unit is 33. There are about a third more air polluters units in the Northwestern Bohemian region in comparison with the average of Czech Republic. This number signalizes that change will affect a vast number of businesses which are cardinally dependent on coal. This data further enhances the extent of the region's transformation.

**Table 2: The distribution of air polluting facilities in the North Bohemian region**

<u>Number of air polluting facilities</u>	Ústí nad Labem Region	Karlovy Vary Region	North Bohemian Region (1 + 2)
Electrical power stations	7	0	<b>7</b>
Heating plants	6	4	<b>10</b>
Chemical industry	5	0	<b>5</b>
Production industry	19	3	<b>22</b>
<b>Total</b>	<b>37</b>	<b>7</b>	<b>44</b>

Source: Authors' compilation based on data from Ministry of the Environment of the Czech Republic (2019)

## **4 The consequences and solutions of transformation of the Northern Bohemian Region to a low-carbon economy**

The Northwestern Bohemian region is very weak economically, with low innovation potential. It is the only region in the Czech Republic and the surrounding regions which had a negative GDP variation in the last decade. The region is heavily oriented and dependent on lignite. The future absence of the coal sector will lead to significant structural changes especially in this region. It is essential to address long-term sustainability in both regional and business strategies. Depending on position in production system, businesses will face substantial strategic changes as they will have to focus on the long-term sustainability of production processes and the improvement of competitiveness. In the region there are four mining companies with around 10.000 workers. There is hardly any substitute for their scope of businesses. There are other businesses which use coal for heating production, electricity production or as a raw material for processing and heavy industry businesses. This sector involves more than 100.000 workers. Related businesses have even more workers. Thus, the Northwestern Bohemian region is expected to be significantly impacted by the transition to a low-carbon economy.

Structural changes will affect mainly the biggest industrial businesses, but the impacts will be much more far-reaching. The Northwestern Bohemian region appears to have many signs which are generally accepted to be negative. These are mainly: high unemployment, lower wages, a high number of people in debt, high criminal rate, etc. Although these characteristics certainly create many difficulties for the inhabitants of this region, they also bring new possibilities which would otherwise not exist.

More than likely, even though the transition may be to some extent processed by the private sector (business strategies, energy strategies, etc.), the transition will not be successful without vast governmental and regional authorities support for innovative projects, renewable sources of energy, job creation, etc. At the moment, it seems that far more attention is focused on the designing of regulatory policies without paying proper attention to the analysis of the impacts it will have on businesses. This is a paradoxical situation when vice versa there should be maximum attention paid to the business' perspective for designing sustainable regulations. It is important to take into account both, top-down regulatory processes and bottom-up responses of businesses to the ongoing challenges.



## Conclusions

Energy transition is not a new phenomenon for businesses because they already are facing the initial phases of the transition lately under contemporary regulatory measures of climate policy which has for many of them appreciable impacts and directly influences their strategic decisions. Businesses face challenges nowadays through the rising prices of emission allowances which have become more expansive during the last few years. Thus, businesses are forced to seek new opportunities and develop energy strategies because of the rising price of emission allowances pushing them to cut costs in their operational process. Prospects of further transformation up to the phase of low-carbon economy are still for a lot of businesses more severe in the future than the present ones. Further energy transition is inevitable to meet international environmental obligations and the energy transition to a low-carbon economy and industrial decarbonization is undoubtedly an inevitable process to undergo. Such a transition evokes enormous regulatory interventions which will in the future generate many challenges either for the regions and/or for the companies.

Regardless, there is still a gap when it comes to knowledge concerning regional energy transitions. The process of energy transition (diversification and decarbonization) has been insufficiently analyzed from a businesses' perspective. This applies especially to the Northwestern Bohemian region. Further regional analysis shall be focused especially on finding out how businesses prepare for such a transition and what are their strategies.

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