



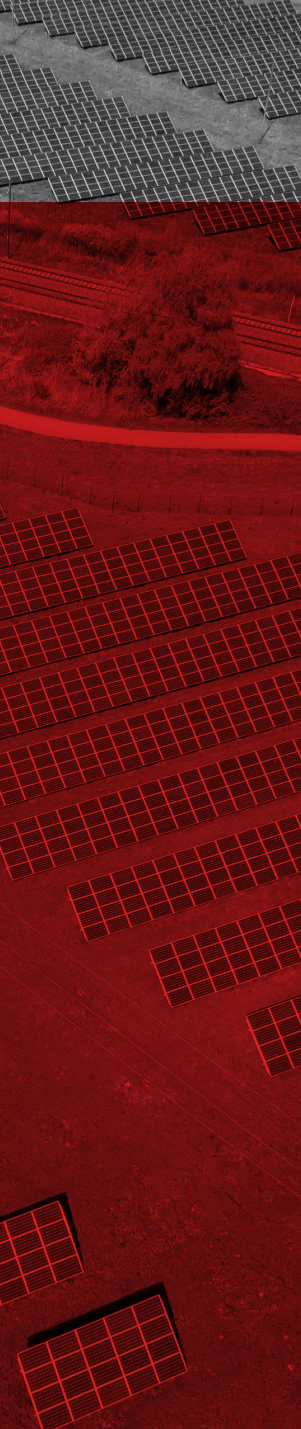
# Just Decarbonisation: A comparative case study on how to make the green transition work for all

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## **ABSTRACT**

A successful green transition across the EU requires an understanding of how structural change works in diverging socio-economic environments. While liberal market economies allow for quick decarbonisation through pricing mechanisms, they tend to struggle with building up long-term economic resilience and competitiveness in former fossil fuel reliant regions. Accordingly, non-market modes of coordinating economic activity will help raise a region's attractiveness by increasing cooperation between firms, workers, and the state. This allows for the creation of sustainable and competitive industries in otherwise structurally weak areas. Therefore, EU policy should both incentivise an early phase-out from fossil fuel and support cooperative approaches to structural change.

## INTRODUCTION

The EU has weathered a series of crises for more than a decade, including financial turmoil, Brexit, the rise of populist politics, and the devastating economic impact of the ongoing COVID-19 pandemic. The European Green Deal (EGD) is a potential way out of this permanent crisis mode. Climate change is a cross-border problem and the transition to a net zero greenhouse gas (GHG)-emitting economy is a challenge that the EU is designed to tackle. This is why the Von der Leyen Commission has put the EGD at the forefront of its political agenda for 2019-2024.

The EGD consists of four main principles, the first of which is a European Climate Law that legally binds member states to achieve net zero GHG emissions by 2050. The second is a Just Transition Mechanism to support territories that face serious socio-economic challenges arising from the transition towards climate-neutrality. The third is the Sustainable Europe Investment Plan, a strategy that focuses on fostering economic growth and competition in Europe. Finally, the fourth principle is an external policy plan that allows for engagement with non-EU countries on green issues to meet global environmental challenges. In addition to tackling the growing threat of climate change—which is estimated to cause an annual loss amounting to 20% of global GDP throughout this century—the over-arching agenda of the EGD presents a unique opportunity to transform the EU (Stern, 2007). 47 years after the publication of *The Limits to Growth* (1972), the EU is out to prove that green growth is not merely a myth but a strong possibility (see Kuper, 2019).

However, the biggest impediment to the EGD has been gaining approval from EU member states. In recent years, not only have disagreements over the rule of law and migration polarised European politics between East and West, but so have climate and clean energy policies. Energy Commissioner Kadri Simson from Estonia—currently the EU's second largest emitter

of CO<sub>2</sub> per capita due to electricity production from oil, shale, and coal—got to the heart of the issue during her hearing at the European Parliament: “It is about real people, their lives and their stories. Entire sectors—families, villages from Galicia to Silesia—will face a lot of changes around them. I know that first-hand because I come from Estonia, where oil shale is still widely used” (cf. Heyvaert, 2020, p. 2).

The current proposal for a Just Transition Mechanism primarily relies on the Just Transition Fund (JTF) amounting to €17.5 billion. The funding criteria are the carbon intensity of a country’s regions, its employment in coal or lignite mining, and the country’s commitment to achieving a climate-neutral EU by 2050 (European Commission, 2020). Further items include InvestEU—the EU’s single investment support mechanism for internal action of at least €8.4 billion, and additional public investment, mobilised through a loan provided by the European Investment Bank (Council of the European Union, 2020, p. 11).

For the EGD to succeed, every member state needs to unite around a socially acceptable agenda towards a green future to ensure cohesion and solidarity. Therefore, the EGD requires a well-functioning Just Transition Mechanism, one that adjusts for inequalities between how different regions and demographics will be impacted by the decarbonisation of their economies. Without an effective agenda, the EGD will not gain the public support necessary to move forward.

A smart allocation of resources requires an extensive knowledge of how technological transitions work. By building on existing research on the structural changes of fossil fuel-reliant regions, this paper aims to identify institutional conditions that can facilitate a green transition and would need to be maintained by the Just Transition Mechanism. It is argued that regions in more liberal market economies can decarbonise more quickly, whereas regions in more coordinated market economies are better in building up long-term socio-economic resilience.

The remainder of this paper is structured as follows: first, best practices regarding economic revitalisation and labour market policies for structural change are discussed. Then, the theory on the varieties of capitalism and its relevance in relation to decarbonisation is outlined to formulate two working hypotheses. Next, a comparative case study analysing the mining regions of Lusatia and South Wales is presented. Finally, the paper concludes by explaining what the findings entail with regard to the EGD.

## **LITERATURE REVIEW**

In 2018, coal accounted for 38.5% of global electricity generation and accounted for 30% of all energy-related CO<sub>2</sub> emissions, making it the single largest source in the world (IEA, 2019). However, coal consumption could retrograde in the upcoming five years. In 2019, 36 governments committed to phasing out coal by 2030. To facilitate the transition, Just Transition task forces, coal transition commissions, and stakeholder consultation platforms are being put in place to explore options for the end of coal use (Sartori, 2019, p. 6). Alternative energy sources, including wind, solar, hydro, biomass, as well as nuclear and natural gas, are readily available options to replace coal. As renewable energies are constantly improving in terms of cost competitiveness with coal, it is reasonable to assume that an energy transition will occur without significantly higher costs (Randall, 2015). Furthermore, renewable energy produces far less local air pollution and uses significantly less water, eliminating the negative externalities caused by coal production (Jensen et al., 2013).

That being said, the energy transition does involve certain risks, particularly for workers, companies, and regions that depend on coal mining and the economic activity it generates. In these instances, workers will face the challenges of re-employment

or exiting the labour market. Companies will run into financial difficulties, and regions have to begin coping with the loss of a significant share of their respective economies (Caldecott et al., 2017, p. 5). As a result, the energy transition must be accompanied by structural policies to cushion the socio-economic impact that these regions will endure and to re-calibrate their supply and demand structures (Geigant et al., 1983). By shifting from traditional heavy industry towards a knowledge-based economy with higher growth and innovation potential, these results are possible (Schulz & Schwartzkopff, 2016, p. 14). Corresponding industrial policies for economic revitalisation need to be underpinned by socially conscious policies. Investments in adult education, a re-training of the workforce, and improved labour mobility policies for climate-damaging sectors will be necessary to avoid long-term unemployment (Cameron, 2020, p. 6).

## **Economic revitalisation**

What makes structural change in coal intensive regions particularly difficult is the propensity of incumbent industries to actively resist economic diversification. This phenomenon, which the literature refers to as “lock-in” (Campbell & Coenen, 2017), occurs when the provision of basic public services hinges on an economic mono-structure. When coal companies are owned by the local government and account for a significant share of the local tax revenue, communities often cling to the industry (Sartor, 2018, p. 30). Companies and local governments refuse to sell their land to new investors, for the sake of keeping competition at bay. Consequently, the former becomes even more reliant on the extractive industry (Hochschild, 2018). This vicious cycle is the reason why coal transitions can be multi-generational processes and why respective regions have higher unemployment rates than the national average (cf. Burton et al., 2018).

To build up resilience against economic upheavals, transitioning coal reliant regions need to diversify their economies (Anczewska, 2020a, p. 5). Fothergill (2017) and Herpich et al. (2018), who analyse historical cases of regional economic restructuring, suggest broad policy packages and multi-level governance as a possible solution. They deem that sole dependence on “priority economic development zones”, whose aim is to capitalise on favourable tax rates and financing to attract investment, is insufficient. This type of centrally planned structural policy disregards locational factors, such as the availability of qualified labour, the proximity to universities and other businesses and the region’s livability. Engaging with local actors to create bottom-up knowledge about regional economic advantages, disadvantages, and opportunities is a precondition for sustainable structural policies.

Schulz and Schwartzkopff (2016) propose a ‘Cluster Policy’, i.e., promoting those sectors of the region in question, that can most successfully occupy market niches. The competitive advantages upon which coal regions can expand usually include existing power, rail, or port infrastructures, land availability, and cultural or industrial heritage. Suitable entrepreneurial activities for such *related diversification* require strong networks between higher education, professional training organisations, local companies, government, and organised labour (Schmid et al., 2009). Mitze et al. (2015) study the innovative performance of German SMEs in peripheral regions. They discovered that companies with collaborative R&D strategies, involving the cooperation with other companies and research institutions, exhibited above-average innovation performance.

Further requisites of the economic revitalisation in transitioning coal regions are the improvement of local infrastructure and soft attractiveness factors. Good transport connections to neighbouring regions can prevent emigration

even when local jobs are missing. Attractive living conditions, i.e., good internet access, leisure opportunities, low pollution levels, security, and amenities for families, are crucial to retaining citizens and drawing in new ones (Herpich et al., 2018, p. 24).

Besides, locating public sector activities in coal regions can relieve the negative consequences of their transitions. Military bases, hospitals, research hubs, or regional government agencies can provide additional economic demand and support the development of new strategic industries. Former coal regions can also use their expertise in the energy sector to move towards renewable energy or energy storage. Examples include solar, wind, or thermal power plants, as well as pilot projects in technology areas like bio-energy with carbon capture and storage (CCS) or hydrogen (Herpich et al., 2018, p. 25).

## Labour market policies

Workers in sectors and regions dependent on carbon intensive industries are being put at risk by a green restructuring of the economy (Altintzis & Busser, 2014). Europe faces a unique challenge as these industries make up a relatively higher share of GDP and employment in countries where living standards are already below the EU average. Right after the European debt crisis, more than 20% of all employees in the EU-10<sup>1</sup> were working in the 15 most emitting industries, compared to 10% in Western Europe. Energy intensive industries also play a crucial role in the southern European Member States, such as Greece and Portugal (Commission, 2012).

In 2015, the International Labour Organisation (ILO, 2015) published *Guidelines for a Just Transition Towards Environmentally Sustainable Economics and Societies for All*. These principles for implementing green transitions that create jobs and eliminate poverty were groundbreaking and had a decisive influence on subsequent publications. The key finding of these studies is that

**1.** The 10 countries that joined the EU in 2004: Cyprus, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia and Slovenia.



workers and employers need to jointly prepare and implement a transition strategy (Gass & Echeverria, 2017).

Sartor (2018) proposes a transition policy that consists of two elements. First, a national or regional transition bodies that represent companies, workers, and local governments, who are in charge of setting timelines, consulting all parties, and developing corresponding policies. Their involvement with local communities can help prevent resistance to change down the line. Second, a clear timeline that sets a phase-out date for coal as early as possible provides certainty to investors while lowering the overall transition costs associated with stranded assets (Anczewska, 2020b, p. 5). This would allow coal companies to eventually cease the training and hiring of workers, and at the same time allow workers to exit the workforce and look for other opportunities. Third, coal companies should be required to develop asset closure and labour management plans in consultation with the transition bodies. Based on these plans, binding transition contracts should detail closure dates, the establishment of funds into which companies pay for the transition of their labour force, and further obligations for the affected companies.

Apart from retirement benefits that provide a pension bridge for older workers who may struggle to find alternative employment, and relocation assistance that supports workers willing to pursue an alternative professional plan elsewhere, the literature puts upskilling and reskilling forward as the primary labour market policy for transitions (Sartor, 2018). Willing workers who have appropriate skills, i.e., younger ones with some post-secondary education, should be supported in pursuing on-the-job retraining. As stand-alone retraining programs have limited effectiveness (see Kluge et al., 2019), on-the-job retraining either within the transitioning coal company or with alternative local employers should be prioritised.

The literature review on best practices for structural change suggests that related diversification and relevant social policies are key to averting economic downturn in former fossil fuel reliant regions. The following chapter explores theoretical accounts that indicate why some economies are better prepared to follow these best practices than others.

## **THEORY/HYPOTHESIS**

### **Theory**

A theory that seems suitable for categorising and explaining diverging ways in which regions manage structural changes is detailed in Varieties of Capitalism (VoC), which has been developed by Peter A. Hall and David Soskice. VoC categorises industrialised nations according to the features of their markets from a business perspective (Hall & Soskice, 2003, p. 4).

The authors claim that there are two ways in which corporate relations can be coordinated: either through participation in Coordinated Market Economies (CME) or through competition in Liberal Market Economies (LME). A firm chooses the mode of coordination that fits its institutional setting given its historical operating procedures and expectations (Hall & Soskice, 2001, p. 8-9). Industrialised states are seen as possessing different complementary characteristics that reinforce one another to create “institutional stability” (Hall & Thelen, 2009, p. 12). LMEs approximate the liberal economic model with its assumptions of materialism and rationality, whereas CMEs rely more on non-market relationships (Mikler, 2011, p. 337).

LMEs are characterised by a deregulated financial sector while access to financing and deterrence of hostile takeovers oblige firms to be flexible and relatively alert to their current profit rates and share prices. There are no laws prescribing the integration

of work councils into corporate governance while unilateral leadership with extensive hiring and firing power is common. Moreover, strict antitrust laws prevent firms from associating with one another in a way that CME-firms do (Hall & Soskice, 2003, p. 24). Therefore, firms in LMEs can also be referred to as *shareholder capitalists*. They depend on diversified portfolio investors who demand higher short-term returns versus debt financing or stable institutional investments (Dore, 2002). This forces firms to “focus on the publicly assessable dimensions of their performance” (Hall & Soskice, 2001, p. 29). Conversely, CMEs or stakeholder capitalism encourage companies to pursue long term business strategies that take social attitudes into consideration (Mikler, 2011, p. 331).

When wages are allocated through pure competition and price mechanisms, there is less incentive for firms to invest in vocational training. This results in a feedback loop where lowered investment in vocational training leads to a less specialised workforce that further disincentivises firms to retain their employees. The higher the turn-over in labour markets, the harder it becomes for labour to organise. Where firms collaborate in order to provide for vocational training because they all benefit from a specific skillset among their employees, the reverse effect takes hold.

Whereas the literature on VoC classifies the United Kingdom as a clear LME, it tends to regard Germany as the archetype of a CME (Blyth, 2003, p. 219; Hall & Soskice, 2001, p. 19-21). German firms are obliged to join their local Chamber of Commerce and Industry (IHK), which forms an umbrella association (DIHK) that also runs a global net of chambers for foreign trade (AHK). The IHKs are not just responsible for education and training, but also provide a platform for mutual support on issues like the promotion of business start-ups, foreign trade, legal affairs, tax policies, environmental compliance, energy

consulting, joint research, or the integration of refugees into the labour market (Schuppe, 2019). Furthermore, firms engage in employer associations to bargain collective wage agreements. These firms are usually comprised of supervisory boards that include representatives of suppliers, customers, competitors, and employees. These supervisory boards are a key aspect of CMEs which results in consensual corporate governance (Hall & Soskice, 2003, p. 20).

## Hypothesis

On the basis of the VoC theory and findings from the literature, the following hypotheses on regional capacities regarding economic revitalisation (H1) and labour market policies (H2) can be formulated:

H1: The more liberal a region's economy is, the less it tends to "lock in" on a non-competitive economic mono-structure. However, more coordinated market economies are more apt to facilitate a related diversification. In other words, LMEs allow for a faster introduction of structural change, whereas CMEs create an environment for more long-term competitive structures.

H2: The more coordinated a region's economic structure is, the more it allows for workers and employers to jointly prepare and implement large scale transitions. This includes establishing (1) national or regional transition bodies, (2) a clear timeline, and (3) labour management plans with upskilling and reskilling provisions.

With regard to the EGD, these hypotheses imply that former fossil fuel-reliant regions within LMEs decarbonise more quickly but struggle with creating the sustainable and competitive economic structures that ensure long-term attractiveness. It is assumed that the logic of coordination through prices and flexibility would simply neglect these regions and reallocate resources, i.e., labour and capital, towards other regions within the national LME.



A comparative study that juxtaposes detailed explanatory accounts with cross-case patterns, is the most suitable methodology for testing the above hypotheses. In accordance with Mill's Method of Difference (1869) and the 'Most Similar Systems Design', a CME region is compared to an LME region that is otherwise similar. The mining regions of Lusatia in Germany and South Wales in the UK share their communities' (1) socio-economic dependence on coal, (2) relative geographic isolation, and (3) eligibility for European structural funds. The following analysis looks at their respective trajectories and embeddedness in national institutions. The data is retrieved from secondary literature, local authorities, and Eurostat.

As is the case for any small-n study, the following analysis has its limitations. It cannot cover all possibly relevant differences and similarities between the cases. It does, however, serve the purpose of identifying certain institutional preconditions that facilitate the green transition and should be promoted by EU policy.

## **ANALYSIS**

### **Germany**

Despite its reputation as being a former pioneer in climate change mitigation, Germany has in recent years failed to reduce national GHG emissions. The share taken by coal-based power in Germany's energy mix is higher than that in the USA, and Germany is the world's largest lignite consumer (Pao-Yu et al., 2019, p.8). In 2016, power from lignite and hard coal—the most GHG emission intensive energy carriers—were responsible for more than a quarter of the country's total GHG emissions (Oei et al., 2018).

However, the German government adopted a Climate Action Plan in 2016 with a target of reducing GHG emissions by 80% by

2050 compared to 1990. It covers seven fields of action, namely energy, buildings, transport, trade, industry, agriculture and forestry. The plan was drawn up in a broad consultation process with the federal states, municipalities, social partners, and NGOs. It included the creation of a commission for growth, structural change, and regional development (i.e., *The Coal Commission*), that would bring structural policy for affected sectors and regions in accordance with climate action (ETUC, 2018, p. 31).

In order for Germany to reach its climate policy target for 2030, whose stated goal is to reduce GHG emissions by 55% compared to the year 1990, it must completely phase out coal-fired power generation in the upcoming decade (Heinbach et al., 2017, p. 35). A failure to do so could weaken the climate change mitigation efforts in many countries that model themselves on this affluent technology leader (Pao-Yu et al., 2019, p. 28).

The Coal Commission, which was mandated by the federal ministries for the economy, environment, employment and the Ministry of the Interior, began operating in 2018. It is under the management of the Economics Ministry, and consisted of 31 members that represented the coal industry, trade unions, coal regions, environmental NGOs, research institutes, and affected communities. The final report, which was published in 2019, was the result of monthly meetings and a compromise between the two working groups for “structural change” and “climate, energy, and energy security” (Herpich et al., 2018, p. 6). It earmarks (1) a phase-out by 2038 at the latest, as well as triannual review cycles, to assess if the exit date can be moved to 2035, (2) a transition law, detailing a €40 billion investment in lignite mining regions over a 20-year period, and (3) compensation for energy users and operators of coal-fired power plants (Reitzenstein & Popp, 2019, p. 4).

The technologies required for the upcoming coal phase-out—gas-fired power plants as backup for peak loads and

renewables—are already available. Throughout the past two decades, Germany has expanded renewables and thereby diversified and decentralised its energy sector. Private individuals, agricultural holdings, and community energy companies (Bürgerenergiegesellschaften) have gradually been replacing a large number of power plants that were in the hands of a few traditional energy suppliers. Electricity production at practically zero marginal cost and a turnover of more than €35.5 billion in 2016 that paid for around 283,000 jobs indicates the economic superiority of the renewable energy sector (cf. ETUC, 2018, p. 46).

The key challenge for German lignite mining regions is, however, that their former business model is irreconcilable with the energy transition (Agora Energiewende). CCS pilot projects in 2011 by Vattenfall and RWE have proven that generating sustainable coal-fired power is inefficient (Schulz & Schwartzkopff, 2016, p. 2). Therefore, approximately 20,700 direct jobs and additional employment in industries that supply the German lignite sector will be lost, which will mainly affect the mining areas in Rhineland, Lusatia, and Central Germany (Schulz & Schwartzkopff, 2016, p. 3).

### **Lignite mining in Lusatia**

The German part of Lusatia encompasses the NUTS 3 regions Cottbus, Dahme-Spreewald, Elbe-Elster, Oberspreewald-Lausitz, and Spree-Neiße in the Land of Brandenburg, as well as Bautzen and Görlitz in the Free State of Saxony. The Lusatian lignite mining region used to be the most important source of energy for the German Democratic Republic (GDR). The GDR was the world's largest lignite producer, supplying one quarter of the global output and twice as much as the second highest producer, the Soviet Union (Kahlert, 1988, p. 10). At the same time, the

country's lignite production was characterised by structural overcapacity. With around 140,000 employees producing 312 million tons of lignite in 1985, the average worker produced about a third of their West German counterparts' output. It is thus scarcely surprising that the German reunification—and privatisation of its lignite production—was accompanied by a radical decline in employment (Herpich et al., 2018, p. 18). Between 1990 and 2000, lignite employment in East Germany had shrunk by over 90% from over 113,000 to 11,000 employees (Schulz & Schwartzkopff, 2016, p. 12).

The government soon intervened with several labour market policies. First, employees over the age of 55 were offered the option of early retirement, i.e., 65% of their respective last net income in the case of unemployment (Buchholz, 2008, p. 136). Second, a retraining programme was introduced that granted former coal workers special unemployment payments, a programme that was especially successful for employees working in engineering and administration (Hofmann & Rink, 1993). Third, the government subsidised job creation measures, i.e., low-paid jobs that prepare people for regular follow-up employment. Although these measures provided social security to former coal workers, their reintegration into the labour market often failed due to demoralising stigmatisation and the lack of job offers (Brenke, Ludwig, Ragnitz & Berlin, 2015, p.12). Severance packages that were negotiated with the lignite mining companies and their work councils offered a more satisfactory solution for all stakeholders. They included part-time work as an interim arrangement. This enabled workers to gradually exit their job, retrain, and seek new employment simultaneously (Hofmann & Rink, 1993).

The lignite industry's future decline, which is expected to happen over the next 13 years regardless of political phase-out targets, will be much less extreme than what the region



experienced in the early 1990s. Currently, about 70% of all employees in German lignite mines are older than 45% and 23% are older than 55, making early retirement packages a viable policy option to cushion the job losses (Schulz & Schwartzkopff, 2016, p. 12). Unlike the reunification, the remaining structural changes happen with advanced warning and it is fair to say that the regional economy of today is far more diversified than it was in 1990 (Lintz et al., 2012, p. 373).

What is more, economic accounts have indicated a positive increase in employment rates over the last decade. Overall, the number of unemployed in the Brandenburg part of Lusatia, for example, fell by more than half between 2004 and 2014, from 71,500 to less than 33,000. Both nominal economic output and overall productivity in Lusatia have also risen more since 2004 than in Germany as a whole (Energiewende, 2017, p. 16).

During this time, the European Regional Development Fund (ERDF), which provides financial resources for cohesion projects in the EU, has been of crucial importance for Lusatia. It introduced the shift away from re-industrialisation through independent large-scale projects and instead towards cluster policy and sectoral reorientation (Weingarten, 2010, p. 81). As a result, tourism came to be viewed as a promising opportunity in Lusatia. Municipalities began to cooperate in order to complement one another and create Lakeland as a regional product.

Relevant rehabilitation measures included the construction of canals, as well as the creation of flooded gravel pits with sandy beaches and harbor basins (Lintz et al., 2012, p. 372). By 2016, the tourism and hospitality industries employed 13,800 people, which was already more than the lignite industry in its entirety (Schulz & Schwartzkopff, 2016, p. 20).

Apart from tourism, another development that could contribute to overcoming the lost jobs in the affected federal states are investments in renewable energy. The expansion of

wind power and photovoltaics could generate over 800 full-time jobs and a regional added value of €83.1 million by 2030 (Heinbach et al., 2017, p. 40). In order to increase accountability, local actors should contribute as much of the necessary equity capital as possible for these projects. In order to ensure public acceptance of the energy transition, municipalities must promote regional investors like local banks or civic initiatives. Some community energy projects or cooperatives in Lusatia—like the KRABAT association, the *Bündnis Heimat und Zukunft in Brandenburg*, the *Klinger Runde*, the *Lausitzer Allianz*, the *LausitzEnergie eG* and *Solargenossenschaft Lausitz eG*, as well as the *Innovationsregion Lausitz (iRL) GmbH*—are already involved in building up renewable energies and set a good example.

In 2010, a regional transition body was created to accompany Lusatia's structural change. *Wirtschaftsregion Lausitz* (2020) coordinates cross-border cooperation between the federal states and neighbouring countries. In addition, it initiates and supports business networks, acquires EU, federal and state funds, carries out local marketing efforts and organises regional as well as national events and trade fairs. In cooperation with the seven counties mentioned above, it created the *future workshop Lusatia* to facilitate civil dialogue about the region's future and draft a development strategy for 2050 by the end of 2020 (Lausitz, 2020).

Areas of regional competence and possible focal points for the future economic development in Lusatia are the plastics, chemical, metal, and food industries (Prognos, 2013). However, only two universities exist in the region, which explains the increasing lack of qualified personnel and the geographic concentration of skills (Vallentin et al., 2018). Currently, only the industrial centres of Cottbus and Görlitz would benefit from cluster policy (Schulz & Schwartzkopff, 2016, p. 20). In order to limit the region's 'brain drain' and attract skilled workers,

investments in education, childcare facilities, and transport infrastructure need to be expanded.

Recultivating open-cast mines can both increase the region's attractiveness and safeguard lignite jobs over the transitional period (Herpich et al., 2018, p. 25). The follow-up costs of further recultivating the lignite pits could be internalised by following the *polluter pays principle* and introducing an energy tax or likewise obligations for lignite mine operators. Furthermore, it would allow Lusatia — as a frontrunner region — to establish post-mining expertise in various fields of research. These could include geology, water management, engineering, urban planning, agriculture, architecture, etc. It is important to note that in light of the upcoming coal phase-outs in CEE, the demand for post-mining expertise will rise (Schulz & Schwartzkopff, 2016, p. 17).

## United Kingdom

Since the impact of a carbon tax tipped the economy away from coal to gas-fired electricity generation in 2016, only a handful of coal-fired power stations remain in the UK to help meet peak demand. Therefore, the country is already entering the post-coal era. After its coal production peaked in 1913, the UK has worked hard to regenerate former mining communities. However, areas that have been affected by coal closures are still characterised by structural weaknesses including high levels of unemployment and low-paying jobs (Fothergill, 2017, p. 3).

In the early 1980s, British coal production still amounted to 130 million tonnes a year, securing over 200,000 jobs. However, the UK's coal industry output and employment rates have been in continuous decline (BEIS, 2019). The privatisation of the UK energy sector in the late 1980s resulted in a phenomenon that came to be known as 'dash for gas'. In order to establish a

foothold in the profitable generation market, newly privatised energy suppliers rushed to build new gas stations and signed up to 'take-or-pay' contracts which locked out coal-fired generators (Winkel, 2002). Since burning gas produces less CO<sub>2</sub> than burning coal, the UK experienced a big reduction in its carbon dioxide emissions (Hausfather, 2019). Moreover, cheap coal imports from Russia, the US, and Australia played their part in driving down British output (BEIS, 2020b).

Throughout the 2000s, however, a third of the UK's power consumption came from coal. Renewables remained negligible, with nuclear power declining as respective plants reached the end of their lives and coal-fired power stations were retro-fitted to meet EU environmental sulphur emissions requirements (BEIS, 2020a). It was only as of 2010 that investments in wind, solar and biomass came to pass, incentivising further closures of coal-fired power stations. The UK's carbon tax was introduced in the aftermath of the Great Recession in 2013. Since the country was struggling with a large budget deficit, the so-called 'carbon price support' was passed to generate additional government revenue. As it increases on an annual basis, the carbon price support has further marginalised coal stations that cannot break even in their emergency function for peak demand (Fothergill, 2017, p. 6). In the period 2014-2019, the UK has meanwhile curtailed its share of coal-based power from 32% to 2% (Pao-Yu et al., 2019, p. 8).

The move away from coal primarily affected the former mining communities that make up 9% of the UK's population, i.e., over five million people (Coalfield Communities Campaign, 2003). Since the early 1980s, a quarter of a million coal mining jobs have disappeared. The ex-miners were offered lump-sum redundancy payments and little more than career advice by the government and coal companies. Whereas the older generation of miners usually left the labour market altogether, younger workers simply left the industry and moved into less well-



paid work (Fothergill, 2017, p. 8). In 1985, local authorities in Britain's mining areas—traditional constituencies of the Labour Party and trade unions—founded the Coalfield Communities Campaign (CCC) to press for regeneration funding and unemployment support. The First Blair ministry responded to the CCC's demands by establishing the Coalfields Task Force in 1997. The Task Force's propositions, which were largely accepted by the government, included more training to help people get jobs, support for new businesses through an enterprise fund, extending the availability of EU Structural Funds and tax incentives to promote new enterprise zones, and investments in rail, bus and road infrastructure (Coalfields Task Force, 2004). Today, median earnings, employment, and business formation rates in the UK's former coalfields are significantly lower than the national average (Foden, Fothergill, & Gore, 2014). As a result, despite the long duration of the UK's coalfield regeneration, the task remains undone.

### **Coal mining in South Wales**

The South Wales coalfield, also known as *the Valleys*, encompasses the NUTS 3 regions Cardiff and Vale of Glamorgan, Monmouthshire and Newport, Bridgend and Neath Port Talbot, the Gwent and Central Valleys, as well as South West Wales and Swansea. In total, the area's population has stabilised in recent years and even experienced an increase of 9% between 1991 and 2018. However, this increase is unequally distributed. It primarily concerns the urban areas along the coast, like Cardiff, Newport, and Swansea, whereas the population in parts of the Gwent Valleys have actually declined (Welsh Government, 2019a). Economic indicators like gross added value, the number of innovation active businesses, and the employment rate in South Wales are below the average values for the UK

(Welsh Government, 2018, 2019b, 2020b). The Gross Disposable Household Income relative to the country as a whole has been declining since the mid-1990s (Welsh Government, 2020a). Younger people in the Valleys perform at a lower academic level compared to their fellow students elsewhere in Britain and a high proportion of workers with few formal qualifications describe the region's poor economic performance (Foden et al., 2014). The region's public health situation also reflects its structural weakness. In 2017, life expectancy in the Valleys was lower and the incidence of bad health higher than in any other former British mining region (Merrill & Kitson, 2017, p. 11). Compared with Lusatia in the period 2000-2017, the following picture emerges: The employment rate has increased by just 5% in South Wales and by 12% in Lusatia throughout the period. Whereas South Wales experienced a recent downward trend and was at around 42% in 2017, the employment rate in Lusatia has been steadily increasing since 2003 up to around 46% (see appx.: Fig. 1). While GDP per capita at current market prices has risen by around 85% in Lusatia and was at €28,200 in 2017, it grew by only 18% in South Wales up to €26,200 (see appx.: Fig. 2). Consequently, the same applies to gross added value in both regions (see appendix: Figure 3). In summary, the structural policies to mitigate the consequences of pit closures and generate new business and employment in South Wales seem not to have succeeded.

Similar to the structural change in Lusatia, welfare benefits played a crucial role in South Wales. In the 1980s, many miners who had lost their jobs, decided to take early retirement or claim Sickness Benefits as a bridge to their state pensions. Unfortunately, however, even younger miners became economically inactive and ended up on unemployment benefits (Beatty, Fothergill, & Powell, 2007). By 2008, just about half of the coal mining jobs

that had been lost in the preceding three decades, had been replaced (Foden et al., 2014).

Just like Lusatia, South Wales has been a beneficiary of European structural funds that aim to reduce economic and social inequalities between the EU's regions and nations. The UK had mostly profited from the European Social Fund (ESF)—the EU's oldest structural fund and instrument for supporting employment—and the ERDF. Britain had pushed for the creation of the ERDF, which compensated for the country's large payments to the Common Agricultural Policy and European Economic Community. The fund was established in 1975, two years after the UK's accession (Hunt et al., 2016). Since then, further programs have been available to Wales, such as COSME, a programme that improved access to finance and markets, Erasmus, and the Programme for Employment and Social Innovation for labour mobility across the EU.

Nevertheless, the 2007–2013 programmes – for which Wales was the UK's main addressee—have not prevented the Valley's inhabitants from voting strongly in favour of Brexit in 2016. The application of the funds has been criticised for inconsistent project oversight and the financing of large prestige projects, which did not create sufficient employment (Merrill & Kitson, 2017, p. 17). This mismanagement might be due to the local authorities' lack of planning capacities since the abolishment of the Welsh Development Agency (WDA) in 2006. As a primary contact for investors, the WDA took care of coordinated planning, links into local universities, and access to grants (The Welsh Affairs Committee, 2012b, p. 18). Established in 1976, WDA played a vital role during the golden age for Wales in the late 1980s and early 1990s. When grants and low labour costs were still sufficient for creating jobs and securing investment, the WDA was a globally visible brand, known for “its ability to get

things done quickly” (Mr Gibson from Wesley Clover, cf. The Welsh Affairs Committee, 2012a, p. 32).

Recent years have shown that incoming investors in the Valleys usually pulled out when the financial incentives disappeared. The lack of long-term policies, like skill development, soon caused companies to move to more competitive havens like China or CEE (Merrill & Kitson, 2017, p. 27). Bennett et al. (2000) who studied the contribution of civil society to the Valleys’ structural change, found that community cohesion disintegrated. As miners’ institutions, chapels, and welfare buildings were replaced with living accommodations or warehouses, a general competition for resources triggered intergenerational antagonism and local rivalries. This might in part explain why local governments in South Wales have not consistently cooperated to come up with a sustainable common product.

The Valleys could also potentially have a comparative advantage in creating wind power. So far, however, respective developments have been impeded by local resistance against turbines on hillsides. Apart from stand-alone programmes like Jobs Growth Wales, which provides services like six-month placements at minimum wage jobs or investment in upgrading public housing, there is no actual strategy to cope with structural change (Merrill & Kitson, 2017, p. 17).

In view of Brexit, regional developments are currently focusing on the national economy as a possible source of future fortune. This might be an opportunity to increase industrial investment by favoring local SMEs that could, for example, be facilitated by decoupling from the Single Market. However, the current UK government’s state aid proposal, which would withhold power to control industrial subsidies from Scotland and Wales, constitutes a potential for conflict between Westminster and the devolved nations (Foster, 2020).

## CONCLUSION AND POLICY IMPLICATIONS

The comparative case study confirms both Hypothesis H1 and Hypothesis H2. The UK succeeded in bringing down its GHG intensity through market-based coordination. Although ‘dash for gas’ and the carbon tax were in fact economically motivated, their directional impulse towards decarbonisation was highly effective. The consensus orientation of German politics, in turn, resulted in a planned coal-exit which will presumably come too late to be consistent with the country’s climate targets.

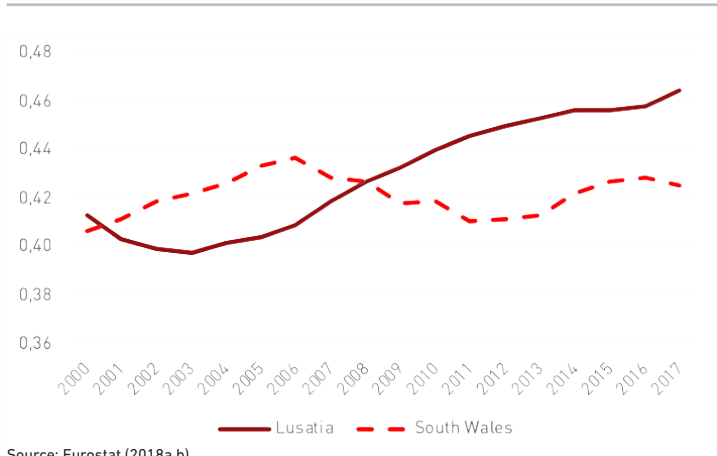
However, the analysis also indicates that CMEs are more capable of creating favourable conditions for structural change in former fossil fuel reliant regions. Whereas part-time work arrangements in Lusatia allowed for successful upskilling and reskilling early on, South Wales had little more than career advice and lump-sum redundancy payments to offer before finally introducing Jobs Growth Wales in 2012. As a result, the Welsh business model for the post-coal era was initially based on low labour costs and tax incentives rather than on qualitative locational factors. This policy approach that is purely premised on price mechanisms turned out to be short-sighted and fatal for the region’s long- term regeneration.

Meanwhile, the community energy projects of Lusatia reveal how cooperation allows for the reinventing and rebuilding of a region’s economy. By empowering local stakeholders, they were able to pre-empt conflicts such as resistance against turbines. Moreover, the cooperation between regional authorities facilitated a common marketing strategy through the setup of transition bodies, which are crucial for attracting investments. Apart from the ephemeral Coalfields Task Force and the WDA—neither of which still exist—the collaboration between counties and municipalities in South Wales have not been very fruitful and consistent.

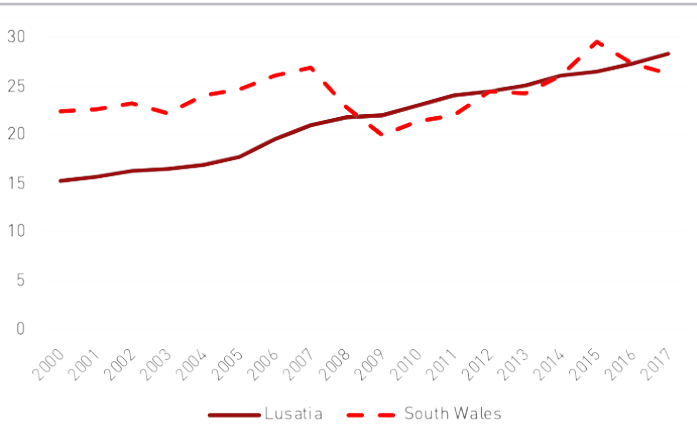
This paper suggests that implementing a fair and realistic transition from a fossil fuel-based economy can be managed when local, regional, and national authorities work together with social partners, NGOs, and research institutes on designing a phase-out policy. The Just Transition Mechanism should encourage the different political levels to interact with each other and fund projects that include a high degree of stakeholder participation and deliver consent-based solutions to increase acceptance and exploit endogenous potentials. Timing is of the essence. The later a structural policy is introduced, the more expensive it becomes for society (Caldecott et al., 2017, p. 4). Based on the British model, the EGD should be supplemented by an ambitious CO<sub>2</sub> pricing model. This could have a steering effect away from fossil fuels and towards renewable energies. On the other hand, the CO<sub>2</sub> price could be paid into a fund that would finance the EGD and a just transition across the EU.

## APPENDIX:

**FIG 1 EMPLOYMENT-TO-POPULATION RATIO**

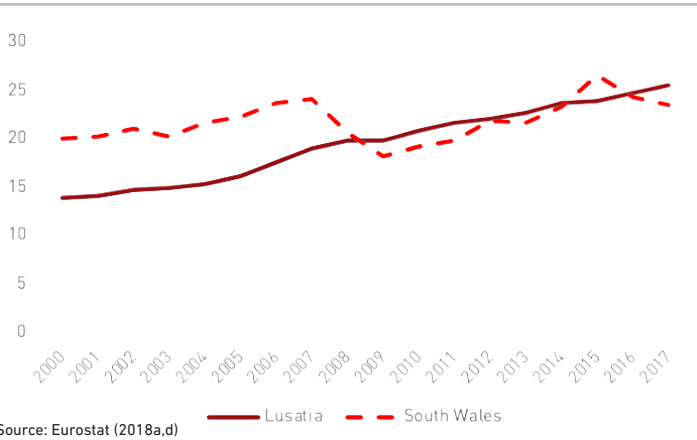


**FIG 2 GDP/CAPITA AT CURRENT MARKET PRICES IN TEUR**



Source: Eurostat (2018z,c)

**FIG 3 GROSS VALUE ADDED/CAPITA AT BASIC PRICES IN TEUR**



Source: Eurostat (2018a,d)

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