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Phasing out identities?

Narratives of coal workers' struggles in Lusatia's energy transition process

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ABSTRACT

In 2020, the German government introduced a legislation to phase-out coal mining and combustion by 2038. Expert reports state that this is too late for Germany to meet its obligations from the Paris Agreement. For many people in Lusatia, one of the three coal mining areas in Germany, even the 2038 coal-exit is happening too fast. They fear for their economic and personal future in the coal-mining region. Workers in the sector are considered the most vulnerable - not just their jobs might be made redundant, but their identities as miners or workers in power-plants may suffer under the phase-out. Embedding this thesis in the field of political ecology, I drew on just transitions discourses and investigated the social implications of energy transitions for lignite workers in Lusatia. Employing a narrative methodological approach, the focus of the thesis' investigation are the stories of four workers employed in Lusatia's lignite sector. Through the thematic analysis of semi-structured interviews and walking interviews, narratives of their energy epistemics, energy landscape perceptions and energy justice claims are retold and reveal these categories to be identity-constituting. By discussing the narratives, the multiple links between lignite workers' identities and their respective epistemics and landscapes were revealed, and out of the associated justice claims, proposals were developed. Synergies between the knowledge that the interviewees drew from their work and education and their perceptions of the landscapes and vice versa were depicted, which ultimately were discovered as influential on who they are, how they want to live and who they want to become. All interviewees agreed that a clear, reliable phase-out with financial assurances for the workers is needed if they are to be able to adapt their identities to a structural change of the region. In light of this conclusion, this paper suggests testing and expanding on the findings presented. Valuing workers' identities in low-carbon transitions can be key to just transition processes. Further research should therefore explore how exactly the recognition of these identities can be reflected in procedures and policies in a just and respectful manner and how workers themselves can participate in these processes.

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Brigitta

Ich war'n Bergmann, weiter hab ich nicht gelernt
Ich hab dieses Land in jedem Winter treu gewärmt
Die Lunge ist wie'n Sack mit Kohlebrocken voll
Im Herzen Asche, in den Adern Alkohol
Ach, meine Grube Brigitta ist pleite
Und die letzte Schicht lang schon verkauft
Und mein Bagger, der stirbt in der Heide
Und das Erdbeben hört endlich auf

I was a miner, that's all I learned
I faithfully warmed this land every winter
My lungs are filled like a sack with lumps of coal
In my heart ashes, in my veins alcohol
Oh, my Brigitta mine is bankrupt
And the last shift has long been sold
And my excavator, it's dying on the heath
And the earthquake finally phases out

Gerhard Gundermann (1955-1998)

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List of Abbreviations

BP British Petroleum

°C degree celsius

CO_2 Carbon dioxide

cf. conferatur (compare)

e.g. exempli gratia (for example)

et al. et alii (and others)

etc. et cetera (and so forth)

ETS Emissions Trading System

EU European Union

f. folio (following)

FDJ Freie Deutsche Jugend (Free German Youth)

GDPR General Data Protection Regulations

GDR German Democratic Republic

i.e. id est (that is)

LEAG Lausitz Energie Bergbau AG and Lausitz Energie Kraftwerke AG (Lusatia Energy Mining Ltd. and Lusatia Energy Power Plants AG)

MEW Marx-Engels-Werke (Marx / Engels Collected Works)

IEA International Energy Agency

IPCC The International Panel on Climate Change

SED Sozialistische Einheitspartei Deutschland (Socialist Unity Party of Germany)

[sic] [thus]

US United States

[…] ellipsis

1. Introduction

At the end of November 2019, I participated in the Ende Gelände[1] action in Lusatia. The aim was to occupy the Lusatian coal infrastructure with our bodies in a non-violent act of civil disobedience. The action was fuelled by the planned phase-out of lignite (thermal coal) in Germany by 2038 (Die Bundesregierung 2020). Expert reports state that this is too late for Germany to meet its obligations as set out in the Paris Agreement (Oei, Hermann, et al. 2020; Oei, Kendziorski, et al. 2020; Wehnert, Best, and Andreeva 2017). In addition, the UN Climate Change Conference in Madrid, hosted by Chile, began on the same date, the 29th of November – reasons enough to push drastically for measures to accomplish climate justice, and to send a clear signal for "borderless solidarity and a good life for all instead of profit and growth" (Ende Gelände 2019a). Early in the morning, our demonstration procession – or "finger" in activist jargon – headed from Cottbus towards the coal train tracks of the Jänschwalde power plant. The atmosphere was tense after Ende Gelände's action at Whitsun 2016, where the camp, the blockades, and demonstration marches were attacked by neo-Nazis. Moving forward, our finger approached a group of demonstrators. From a distance, it was not possible to identify their political alignment, only that they were mobilising against the Ende Gelände action. The head of the march started to shout slogans calling the opposing demonstrators fascists. Many of the activists joined in these chants. As we passed the people demonstrating next to the road, there was nothing visible to indicate that these people supported right-wing ideas. They waved flags depicting the logo of the IG BCE, the coal worker's union, and held signs which read "without us your soy latte stays cold" and "supplying people with electricity is not a crime". In the days that followed, I closely observed the media coverage of the action and was reassured to see a lot of support for it from various news sources. But one video made me reflect more intensively on class and environmentalism (Der Spiegel 2019). The very same people our finger had vilified were interviewed by a camera crew from the Spiegel magazine as we walked along. Seeing their emotions when they realised that they were called fascists, and their expressed feelings that the discourse on the coal phase-out and its material consequences were being carried out on their backs made me feel guilty. Even though Ende Gelände explicitly wrote in their action consensus that "our action is not directed against […] workers" (Ende Gelände 2019b), the people felt devalued. Instead of being open and fostering understanding between workers and activists in order to stand together for climate justice and a just transition in Lusatia, we had further deterred these workers from environmentalist positions. Out of the felt guilt for having been part of this classist encounter between activists and workers, the idea for this master's thesis arose. Having experienced this situation,

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[1] Ende Gelände is a European activist network consisting of people from anti-nuclear power and anti-coal movements, environmental organisations, grassroots climate action groups, left political groups, etc. With actions of civil disobedience, the alliance aims to send a powerful signal for genuine change in order to put climate before profit.

I wanted firstly to understand what kind of personal connections workers have to their jobs and surrounding environments, and secondly what justice claims coal workers in Lusatia have on the energy transition and the subsequent structural change.

1.1. Research problem

In energy transition processes, the jobs of workers in fossil fuel industries are at risk, and with them their livelihoods and identities. Yet their voices are marginalised both in research and in public debates (Bose et al. 2019; Miller, Iles, and Jones 2013). Also, in academia, more attention is paid to renewable energy than on how to best phase out fossil fuels (Geels 2014). But York (2010) found that expanding the use of renewable energy sources does not necessarily lead to a decline in the consumption of fossil-fuel energy sources. In this paper I want to confront these two issues and explore how workers in the lignite sector perceive the energy transition in relation to their identities, and the justice claims that arise in the wake of it. Dealing with the lignite phase-out in Lusatia from a worker's perspective can give guidance about how social conflicts arising in the course of low-carbon transitions can proceed, and thus can become an example (both negatively and positively) for transformation processes in other sectors (Bose et al. 2019).

1.2. Aim

The aim of this thesis is to understand whether and how labour in lignite-extracting open-cast pits and coal-burning power plants shape workers' identities and how low-carbon transitions affect these. This shall foster a deeper understanding of workers' struggles in the transformation processes in Lusatia, creating awareness of workers' justice claims, their livelihoods and the region itself, and aims to embed workers' struggles into a just transition discourse in order to strengthen political expression and organisation towards sustainable development in the region.

1.3. Research questions

In order to be able to accomplish these aims, I formulated two research questions:

- How does working in the lignite mining and coal-fired power sector shape the identity of workers in Lusatia?
- How can the coal phase-out consider these identities in a just and respectful manner?

1.4. Structure of the thesis

In chapter two, I will provide a context for my thesis by embedding the coal workers' struggles in Lusatia into a warming climate, and geographical conditions. Chapter three theoretically embeds the thesis in the fields of political ecology and just transitions, followed by the development of an energy identity framework with a focus on the social dimensions of the energy transition which will be applied in the analysis. In chapter four, I explain my methodological procedure and outline my positioning. In chapter five, I present the thematic narratives of each interview partner, focusing on their energy epistemics,

their perceptions of the energy landscape, and their claims for energy justice, conceived as constituting their energy identity. Chapter 6 will set the narratives in relation to each other, offer proposals, discuss the findings, and answer the research questions, and in chapter 7 I will draw conclusions.

2. Background

In the following, I will approach the global climate crisis, coal-fired power generation and the coal phase-out in their interconnectedness. Then the role of the workers in the coal sector will be discussed. The chapter concludes with an historical overview of Lusatia as an energy region.

2.1. Lignite power, climate change and the German energy transition

CO_2 emitted from coal combustion (both lignite and hard coal) is responsible for more than 0.3°C of the 1°C rise in global temperature in comparison to pre-industrial times, making coal the single largest source of global temperature increase (International Energy Agency 2018). A newly published study found that the 10 most carbon-intensive power plants in the world are all coal-fired (Grant, Zelinka, and Mitova 2021) and McGlade and Ekins (2015) showed that 80% of current coal reserves must stay in the ground in order to meet the target of 2°C. But 'even' a rise in temperature of 2°C would have devastating consequences for the Earth's climate system, with increases in mean temperatures, heavy precipitation, drought, rising sea levels, extinction events, ocean acidification and climate-related risks to people's health, livelihoods, food security, water supply, etc. (IPCC 2018). While CO_2 is largely emitted in countries of the Global North and elites in the Global South[2], its impacts affect people in the Global South most severely (Diffenbaugh and Burke 2019). Already in 2008, climate scientists had pledged for a complete divestment from coal-fired electricity by 2030 (Hansen et al. 2008). Today, Germany is still the largest energy consumer in the European Union, the largest lignite producer in the world and one of the ten largest coal-burning countries globally (BP 2018), and yet the country has only recently begun to organise its coal phase-out. On the 3rd of July 2020, the German Bundestag passed the "Gesetz zur Reduzierung und zur Beendigung der Kohleverstromung" (Act on the Reduction and End of Coal-fired Power Generation), also known as the "Kohleausstiegsgesetz" (Coal Phase-Out Act). This multi-stage plan includes procedures for phasing out coal-fired power generation by 2038. It encompasses the reduction and termination of coal-fired power generation (hard coal and lignite), the possibility of cancellation of ETS (Emissions Trading System) certificates, electricity price relief measures for end consumers, and an adjustment allowance to facilitate the transition to retirement for older workers in the coal sector. Lignite has played a decisive role in power generation in Germany for many decades

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[2] Following the work of Antonio Gramsci, whose essay "The Southern Question" drew attention to unequal national processes of economic development and the role of capitalists in processes of "internal colonization", I will use the term "Global South" to "address spaces and peoples negatively affected by globalization", including subjugated peoples and poorer regions within wealthier countries (Mahler 2018, 32).

(Sandau et al. 2021). Coal, both lignite and hard coal, have been used in Germany since at least the Middle Ages, and the fossil fuels are closely linked to social development and ingrained in regional cultural identity (Morton and Müller 2016). Thus, the energy transition raises not only technical challenges but also social issues. Although the number of people employed in the sector has been decreasing throughout Germany for years, the extent of the changes for the regions on a social, ecological and economic level is considerable (Sandau et al. 2021).

2.2. Workers' struggles in coal industries

Workers in the lignite sector in Lusatia are currently exposed to a multifaceted struggle. This is most evident in the successive termination of their jobs until 2038, which endangers their work in a field of expertise and their economic security. Bell writes that coal workers are "literally and metaphorically on the coal-face" as "they are the least able to find individual solutions to all of this, such as changing jobs and homes" (2020, 145). On top of this, they are affected by structural classism and partly held responsible for the negative impacts of coal (Bell 2020). Due to the geographical proximity of their homes to open-cast mines and power plants, they, like all people in the region, are affected by environmental damages such as fine dust pollution, noise pollution, and the loss not only of flora and fauna but of whole villages due to the expanding open-cast mines. Also, they are affected by the consequences of climate change accelerated by the burning of lignite.

The scientists and climate activists Malm and Müller (Ondreka 2021) discussed the role of coal workers in the context of the coal phase-out and the climate justice movement: the workers' material as well as ideational dependency makes it unlikely for them to express interests from their work-place positions in a way that would translate into climate consciousness (cf. Malm in Ondreka 2021). Huber (2019), too, supports this argument when he writes: "In environmental struggles, it is often labour and capital aligned against activists". Historically, the working class gained power directly through its work with coal and thus had the means to influence energy distribution (Röttger and Wissen 2017). Strike action had enormous impacts on various industries. This social and political emancipation of the working class was carried out at the expense of the ecological sphere (Röttger and Wissen 2017). Today, however, both are in danger of being undermined – capitalist production sets out to erode, as Marx noted in Capital, "the sources of all wealth": "the earth and the worker" (MEW 23, 530 in Röttger and Wissen 2017, 472 f.). This is also why Miller, Iles and Jones emphasise that "energy debates need to be informed by robust empirical and theoretical inquiries into what current and future energy changes will mean for diverse groups of people" (2013, 136) and Bose et al. (2019) point out that in the Lusatian energy transition it is precisely the perspectives of LEAG workers that are short-changed, misrepresented or neglected in public debates on lignite. My aim is to change this and, by examining the energy identities of coal workers, to gain insights into how workers employed in the Lusatian lignite industry (open-cast pits and

lignite-combusting power plants) access their work through knowledge, perceive energy landscapes and formulate justice claims within the energy transition.

2.3. The "coal and energy district" Lusatia

Lusatia is one of the three coal-mining areas in Germany. The German part of Lusatia includes the south of Brandenburg and the north of Saxony (fig. 1). It encompasses the historic regions of Lower Lusatia in the north and Upper Lusatia in the south. Coal mining has been present in Lusatia since the end of the 18th century and has played a major role in the lives of its inhabitants since (Müller 2017). After the Second World War and the division of Germany, the GDR (German Democratic Republic) lacked a stable energy system and the starting position for heavy industry was anything but good. There was, however, a huge lignite deposit in Lusatia. Thus, with the GDR's first Five-Year Plan from 1951 to 1955, the primary goal was to build up heavy industry and develop an economy in which Lusatian lignite played a significant role. With the construction of the coke combine "Schwarze Pumpe", the narrative of the GDR as the "largest lignite producer in the world" began (Neues Deutschland, 29.7.1955 cited in Wolle 2020, 10). The lignite fields of Upper Lusatia were also incorporated into the "coal and energy district" (Müller and Steinberg 2020, 21) of Cottbus and supplied the GDR with electricity and coal briquettes, among other things. With the reunification, the region experienced a severe recession. More than 90% of the people employed in the lignite sector were made redundant and a large-scale exodus followed, which changed the regional social structure (Gürtler, Luh, and Staemmler 2020), because it was mainly the highly educated, young people and women who left (Lorenz and Träger 2020). The structural change at that time took place rapidly and harshly, which was a traumatic experience for many local residents and still determines how people encounter the planned coal phase-out and the renewed structural change today (Gürtler, Luh, and Staemmler 2020). With the fall of communism came not only the great wave of redundancies, but also the transformation of Lusatia into a "new German region of concern" (Rietzschel 2019). Today, Lusatia is associated with "a lot of nature, few people, but wolves and, of course, lignite [...] as well as a solid right-wing extremism problem" (Seibring 2020, 3).

Four opencast mines - Jänschwalde, Welzow Süd, Nochten and Reichwalde - are currently still being operated by LEAG. Lignite is transported from these to the three coal-fired power plants in Jänschwalde, Schwarze Pumpe and Boxberg via a rail and conveyor network. The three power plants are among the ten most emission-intensive industrial plants in Europe (The European Pollutant Release and Transfer Register 2015). Today, about 8000 people are still employed by LEAG (leag.de 2020), which is one of the strongest employers in the region and shapes the region socially and in its materiality (Bose et al. 2019). Morton and Müller (2016) write that in Lusatia, the coal industry represents an identity-forming part of society that is deeply anchored in the culture, and Lorenz and Träger (2020) also emphasise that the coal sector in Lusatia is "highly emotionalisable" due to the experience of the comprehensive structural break in 1989/90, which, in addition to the loss of jobs, also cut deeply into social structures,

since the GDR's social and cultural life was largely organised via the labour collectives. With this historical and geographical constitution, Lusatia has a particularly high potential for examining the diverse tensions between work in the coal sector, identity formation, and the planned coal phase-out.

Figure 1: Lusatia (red) in Central Europe, Source: Wikipedia, 2021

3. Theory

Beginning from within the theoretical contexts of political ecology and just transitions, in this chapter I aim to lay a theoretical 'energy identity' groundwork for the subsequent analysis. Following Miller, Iles and Jones (2013) by focusing on the social dimensions of energy transitions, I focus on 'energy epistemics', energy 'landscapes', and 'energy justice'. These concepts are first presented as understood by Miller et al. (2013), before being discussed, and expanded on. They are then operationalised for case-specific analyses, making use of further literature to strengthen their suitability for the exploration of coal workers' energy identities. The first research question will be addressed using the notions of 'energy epistemics' and 'energy landscapes', and the second research question will be approached in the subsequent analysis, making use of the concept of energy justice.

3.1. The political ecology of lignite workers' justice claims

Proceeding from the research questions and the given background, this thesis is theoretically embedded in the thinking of political ecology and just transitions towards low-carbon economies. Research within political ecology, similarly to climate justice movements, focuses on "marginalised 'front-line' communities" as key actors in the climate struggle (Huber 2019). These are mostly understood as people who are most and most directly threatened by the impacts and consequences of climate change, such as peasants, fishermen and indigenous peoples. Huber (2019) asks how these theories can also be applied

to people who are fully integrated into capitalist commodity accumulation, benefit predominantly from it, and are not exposed to any obvious threat of toxic pollution. Since these premises also seem to apply to lignite workers in Lusatia, this question needs to be investigated. By outlining the core assumptions of both, political ecology and just transition in the remainder of this section, I will show how the theories can be utilized to better understand lignite workers' struggles in relation to their expiring jobs, their work-related epistemics and their understanding of the landscape in the dawn of Germany´s energy transition.

The discipline of political ecology developed from the 1970s onwards. The term, coined by Eric Wolf (1923-1999), has been used in various ways since the discipline's inception, typically referring to "multiple and diverse critical approaches to studying the nexus between human societies and the natural environment" (Tetreault 2017, 1). Following Robbins (2020), in this thesis political ecology should be understood neither as a "body of theory" nor as a method, but rather as utilizing and supporting the theoretical development in the remainder of this chapter, as it assists the mobilizing of "concepts from broader schools of thought to explain otherwise confounding socio-environmental outcomes" (Robbins 2020, 84). According to Robbins (2020), Political Ecology is about

> identifying broader systems rather than blaming proximate and local forces; […] viewing ecological systems as power-laden rather than politically inert; and […] taking an explicitly normative approach rather than one that claims the objectivity of disinterest (Robbins 2020, 10).

According to Tetreault (2017), the first studies published in the field of political ecology, such as those by Blaikie (1985) and Hecht (1985), had a rather Marxist slant, focusing on structural and class analyses in order to investigate ecological degradation in concrete regional settings. Following this early approach, a definition by Blaikie, Bryant and Brookfield (1987) will be followed for this work, which presents political ecology as combining the concerns of ecology and political economy, and focuses on the constantly shifting dialectic between society and land-based resources, but also within classes and groups in society itself. This approach will allow the analysis to focus on class, and examine power imbalances within lignite energy production in Lusatia in relation to material energy landscapes, and the implications for lignite workers. Following Robbins (2020), the workers are not to be blamed as local forces for coal burning and thus for the devastation of the landscape and immense CO_2 emissions, but are considered as embedded in a larger systemic context of power, and should correspondingly be given a voice as a vulnerable group within the German energy phase-out.

In searching for ways to consider lignite workers' identities in the Lusatian low-carbon transition, the concept of just transition presents itself as apt. Over the years, the tension between jobs and the environment in class and environmental politics (Huber 2019) has led to a growing recognition in academia that socio-technical transitions raise important issues of equity and social justice, leading to

calls for just transition (Mayer 2018). The term, coined in the US in the 1970s, refers in its broadest sense to a fair transition from fossil-based economies to international low-carbonization or decarbonization. The term is often defined differently depending on for whom justice is to be achieved (humans or/and nature; distinct groups or all people) (Stevis and Felli 2015), precisely what kind of justice is to be achieved (environmental, climate, energy, social justice, etc.) (Evans and Jones 2011; Heffron and McCauley 2017), how it is to be pursued (through distributive, procedural, restorative and/or recognitional justice) (McCauley and Heffron 2018; Schlosberg 2003) and how corresponding implementing institutions and policies are structured and designed (Snell 2018). In this thesis, I examine the justice claims of a specific group with a focus on lignite workers in Lusatia. In doing so, an energy justice position will be adopted. Heffron and McCauley (Heffron and McCauley 2018) write that this approach is particularly suitable when the focus is not on adaptation, as is often the case with environmental and climate justice, but rather when justice claims are addressed before the "event" has happened. Moreover, energy justice is often negotiated with a focus on local struggles, whereas environmental justice is often discussed on a national level, and climate justice on an international level. Jenkins argues for the application of the concept of energy justice, as opposed to approaches focused on environmental or climate justice, on the basis that such an approach (1) increases the potential of policy implementation; (2) goes beyond a grassroots level, since energy justice is not the result of anti-establishment social movements like environmental and climate justice; and (3) is part of a strong methodological tradition with a number of academic and policy-relevant applications (cf. Jenkins 2018, 120). Just transition is thus understood in this paper as a process that leads to the low carbonisation of Lusatia in the transition away from coal mining and power generation constituting the main industry sector, taking into account the identities of coal workers in relation to "energy production and consumption, […] and the right to participate in choosing whether and how energy systems will change" (Miller, Iles, and Jones 2013, 143) in a respectful way.

With Political Ecology as 'utilizer and supporter' for the theoretical development and the conceptualization of just transitions from an energy justice perspective, the social dimensions of energy transitions will be addressed below in order to depict the interconnections between politically enforced material change of lignite infrastructures and their social and material implications for lignite workers' identity formation.

3.2. Energy identities and social dimensions of energy transitions

Calls for the consideration of social aspects in (just) energy transitions have become louder in recent years. Multiple scientists have taken up the issue (see e.g. Mayer 2018; Miller, Iles, and Jones 2013; Sovacool et al. 2019; Sovacool 2021; Snyder 2018; Pfister and Schweighofer 2018). Especially with regard to local justice claims, the connection of identity and landscape in energy transition processes is emphasised (Bosch and Schmidt 2020; Deshaies 2018; Huber 2015; Pasqualetti and Stremke 2018;

Wheeler 2014). However, the field remains largely under-researched, especially in relation to identities and cultures that relate to the experiences, customs and ways of living and labour of people employed in coal-extracting industries (Bose et al. 2019; Kirk, Jefferys, and Wall 2012).

Zygmunt Bauman sees identity formation as embedded in asking oneself the questions "'who am I, 'how should I live', 'who do I want to become'" (Bauman 1988, 62). He reminds us that social identity processes are embedded in temporal frames (Bauman 1988) and often arise out of uncertainty (Bauman 1996). Previous generations' identities were shaped by "strong class-based and regionally specific communities" (Kehily 2009, 1). Hence, one could argue that these continuities are now beginning to change for people employed in the lignite sector due to the energy transition.

The materiality, i.e. the infrastructures of energy systems depend on how people think about and understand them (Miller, Iles, and Jones 2013). But also vice versa, existing infrastructure can shape epistemics and understandings of energy landscapes. In her study of a British former mining village, Wheeler (2014) found that mining vestiges play a significant role in the construction of place-based identities. Claims to justice can be read as attempts to maintain or self- sufficiently reshape identities. Stewart, Liebert, and Larkin (2004) and Wheeler (2017) write that by linking identity to landscape, events and material history, (community) identities in particular have the power to connect the past to the future and thus to create positive prospects. Using Miller, Iles and Jones (2013) 'Social Dimensions of Energy Transitions' (see chapter 3) I will investigate workers' energy identities. I understand energy identity as one aspect of the identity formation of coal workers. The study of the interconnectedness of work and personal situatedness in the fossil fuel extracting and combusting sector can, however, provide insights into how identity is linked to work in the mine and the power plant, and what this means for a just transition process.

In the remainder of this section, Miller, Iles and Jones' (2013) article will be given primary attention, as it will serve as an underlabourer for the development of the subsequent energy identity framework in which the further analytical procedure of this thesis will be carried out. The authors argue in their paper for a three-dimensional approach to energy transitions focusing on social perspectives. The importance of seeing energy transitions through explicitly social lenses, in addition to spatial and economic ones, has been repeatedly emphasised by several scholars dealing with low-carbon energy transitions (see e.g. Abraham 2017; Bridge et al. 2013; Huber 2015; Mayer 2018). An energy transition should not only include efforts to renew technological energy systems and change pricing, but also encompass broader social and economic structures that are built around energy production and consumption. Replacing old technologies with carbon-free ones in turn has implications for the energy system, social practices, values, relationships and institutions interacting with the natural environment. Thus, Miller et al. (2013) argue that over time such upheavals create or reinforce unequal distributions of power and wealth in industrial societies. Similarly to Huber, who understands the social production of space in energy

transition processes in three specific ways – "energy extraction and geopolitical imaginaries, energy infrastructure and urbanization, and energy consumption and geographies globalization" (2015, 3) – Miller, Iles and Jones (2013) regard it as necessary to consider "energy epistemics", "energy infrastructures", and "energy justice" as important parts of any energy transition analysis (Miller, Iles, and Jones 2013, 136f). With 'energy epistemics' they refer to the knowledge people have about energy and ask who has this specific knowledge, how is it known and whose knowledge counts in managing and reshaping the energy future? With respect to 'energy infrastructures', the authors encourage us to ask what it means that energy infrastructures are often hidden from the eyes of the population and yet exert such a strong influence on everyday lives and economic structures that they can suppress alternative energy resources, without this being consciously noticed. The third dimension they propose is that of 'energy justice'. Here, they raise the question of what it means to implement a just energy transformation that neither perpetuates the existing negative impacts of energy production and use, nor creates new ones.

In the following three subsections, these dimensions, sometimes widened, renamed, and operationalised, will be adapted towards the case in order to develop a framework for the subsequent analysis. Within this theoretical framework, the thesis intends to identify place-based identities of coal workers, and to examine how attempts are made to maintain these through justice claims. The aim is to operationalise energy epistemics in section 3.2.1., and the concept of energy landscapes in section 3.2.2., in such ways that they can serve as analytical frameworks to explore the first research question. In 3.2.3. a theoretical framework is to be developed with which it should be possible to approach the second research question.

3.2.1. Lignite workers' energy epistemics

Miller et al. (2013) and Pfister and Schweighofer (2018) agree that energy infrastructures require highly skilled experts for the development, building and operation of plants and other related facilities and institutions. Thus, the materiality of our energy systems depends on how people think about and understand them. Accordingly, changes and restructurings of the energy infrastructure are also dependent on how people access them through knowledge. Furthermore, social conflicts about, for example, energy technologies, consumption and transmission are fought out with knowledge-based practices (Pfister and Schweighofer 2018). Pfister and Schweighofer (2018) understand energy epistemics as a link between 'practices' and 'sociomaterial orders', which they see in their entirety as components of energy cultures. All this underlines the importance of energy epistemics. The concept of energy epistemics developed by Pfister and Schweighofer encompasses the "knowledge practices that govern energy systems" (Miller, Iles, and Jones 2013, 142). These are mostly sophisticated expert practices such as energy production, distribution and pricing on which the successful operation of current energy systems depends (Miller, Iles, and Jones 2013; Pfister and Schweighofer 2018). As a fundamental part of energy production, the epistemics of coal workers must also be included. In the

nexus of the coal phase-out between politics, coal companies, environmental activists and consumer demands, their epistemics seem marginalised. However, starting from political ecology, it can be of great importance to examine their voices and their knowledge approaches precisely because of this marginalisation in the discourse in order to set the basis for a more just energy transition.

Pfister and Schweighofer (2018) distinguish between implicit and explicit knowledge. According to them, implicit and often tacit knowledge is to be understood as the unconscious basis on which action is usually taken. They describe it as learned, internalised, and thus embodied, and as the basis for everyday practices – whether it concerns care work at home or the technical work of an electrician in a lignite-fired power plant. Explicit knowledge is understood as that which "is produced, debated, claimed, communicated and contested in the form of concepts, theories, models and methodologies" (Pfister and Schweighofer 2018, 228). These two types of knowledge and their theoretical framing will serve as a basis by which to see in which epistemologies workers embed their lives and work.

3.2.2. Energy landscapes

With 'energy infrastructures', Miller et al. (2013), following Edwards et al. (2009), refer to "'big, durable, well-functioning systems and services' that are typically hidden from public view yet highly significant in structuring social, political, and economic organization" (Miller, Iles, and Jones 2013, 141). With this definition, the authors picture "vast, industrialized, large-scale […] drills, mines, pipelines, storage facilities, railroads, tankers, refineries, and distribution systems that render fossil fuels seemingly cheap and abundant for consumers" (Miller, Iles, and Jones 2013, 141). My aim is to broaden and expand on this concept with the introduction of the notion of 'energy landscapes'. The term shall be used to emphasise the connection between cultural and material aspects of human-nature interaction, but also to explicitly include in the analysis remnants such as quarry ponds and abandoned infrastructures only secondarily caused by mining and combustion (e.g. abandoned training schools or apprentice dormitories). The importance of considering landscape in low-carbon energy transition processes has been emphasised by many scholars recently (see e.g. Bridge et al. 2013; Davidson and Gross 2018; Huber 2015; Miller, Iles, and Jones 2013; Pasqualetti and Stremke 2018). In this regard, Huber argues that theories of energy transition need to address the space and territory at the heart of any energy transition process, as it is particularly relevant to highlight the links of such territorial processes to the larger energy system and concerns about climate change (Huber 2015, 8). Bridge et al. (2013) stress that low-carbon energy transitions are experienced by many people as the transformation of their local environments. Pasqualetti and Stremke define energy landscapes more precisely as follows: "Energy landscapes are co-constructions of space and society that come into existence through a series of material and social relations" (2018, 95). Bridge et al. (2013) use the idea of 'topophilia', or love of place, to describe both the attachments people form to places with certain materialities, and the visual aesthetics (the optics of the 'beautiful') prevalent in the way Western societies appreciate landscape. When people form emotional connections to changing landscapes, those places can become sites for

processes of identity formation and stories of living and working (Stewart, Liebert, and Larkin 2004). Pasqualetti and Stremke (2018) write that people in "energy-rich" regions have not infrequently become habituated to the energy landscapes that have been created, and perceive mines and power plants, for example, as their evolved, well-known environment. Either they are not bothered by them, they consider it counterproductive to complain, or they accept them as a "necessary evil" (Pasqualetti and Stremke 2018, 95) that leads to job creation. Perceptions like these can lead to opposition to transformation processes and new 'greener' technologies. This theoretical framing, together with the given definition of energy landscapes, is intended to lay the foundation for examining how lignite workers understand and make sense of their working and living landscapes, in a region shaped by lignite mining and power generation.

3.3.3. Energy justice

Miller et al. (2013) describe energy justice as a fundamental but often neglected dimension of energy transitions. Their third category

> addresses the serious and conflict-laden normative and ethical issues raised by energy production and consumption, including equitable access to energy, the fair distribution of costs and benefits, and the right to participate in choosing whether and how energy systems will change (Miller, Iles, and Jones 2013, 143).

Energy justice has recently emerged from literature on environmental and climate justice as

> a new cross-cutting social science research agenda, which seeks to apply justice principles to energy policy, energy production and systems, energy consumption, energy activism, energy security, the energy trilemma, political economy of energy and climate change (Jenkins et al. 2016, 175).

McCauley defines energy justice as the "application of rights, both social and environmental at each component part of the energy system" (2018, 2). Consequently, within the field of energy justice, questions such as what kind of energy systems should be built for the future, where they should be built and how their benefits, costs and risks should be distributed can also be examined and answered (Miller 2012 in Miller, Iles, and Jones 2013, 143). Understood as embedded in the national and international contextualisation of environmental justice and climate justice, energy justice is perceived as enacted locally but entangled with global structures that determine social, economic and ecological spheres and their intersections like capitalism, colonialism and patriarchy. Jenkins et al., similarly to Bell (2014), Schlosberg (2003) and Sovacool (2016), divide energy justice into **distribution** ("where do injustices emerge"), **recognition** ("which affected sections of society are ignored") and **procedures** ("which processes exist for their remediation") (2016, 175). This tripartite division and the questions posed by Jenkins et al. (2016) will provide the analytical framework by which justice claims are revealed in their relation to coal workers' identities as comprising their epistemics and perceptions of landscape.

4. Methodology and methods

The research questions posed and the theoretical framework outlined above require a qualitative approach to the study, as I investigate a specific, local problem (coal phase-out in Lusatia) in conjunction with a group of people (lignite workers) whose voices are often ignored, particularly in the environmental debate. Qualitative research provides tools to develop theories by talking directly to people and visiting their living and working places, and helps to understand the nuances and complexities of lived experiences that quantitative research is unable to capture (Bryman 2016; Creswell and Poth 2018). Within the field of qualitative research, a narrative research approach was chosen. Connelly and Clandinin write that

> narrative and life go together and so the principal attraction of narrative as method is its capacity to render life experiences, both personal and social, in relevant and meaningful ways (1990, 10).

As the research's focus lies on "lived and told" (Creswell and Poth 2018, 67) individual experiences of the coal phase-out and the associated effects on the identity and landscape perception of coal workers, this approach was chosen as an adequate way to capture and reproduce personal stories. Hence, the thesis aims methodologically to tell stories of individual experiences in order to gain understanding of the personal implications of the energy transition in Lusatia. Additionally, narrative research sheds light on identity and helps to reveal specific localities of stories. Stories are hereby understood as – following Kramp – "[…] a narrative structure that organizes or emplots [sic] human events. It is a construction by the teller or narrator" (Kramp 2004, 106). Furthermore, with narrative research it is possible to let participants interweave their personal life stories with landscapes perceptions. This enables the researcher to embed the narrative in a wider personal (work, identity), cultural and historical context (Creswell and Poth 2018). Therefore, the aim is to collect multiple types of information and to spend considerable time with the individuals in order to harvest thorough narrations. Thus, the data collection was conducted in two cycles, interviewing every interviewee twice as follows:

1. Cycle: online semi-structured interviews (May 2021)
    a. Interviewees were asked to present two artefacts representing their life in Lusatia as an energy region/landscape and their experience of the coal phase-out
2. Cycle: Walking interviews (June 2021)
    a. Unstructured walking interviews with interviewees in their familiar environments in Lusatia

The interviews were analysed narratively, using the theory developed above as a thematic framework. Thereby an inductive-deductive logical process was followed by which the theoretical analysis frame and the initial analysis were done simultaneously (Creswell and Poth 2018). The theory and the development of the energy identity framework was decided upon after the initial review of the data. In the remainder of this chapter, the detailed methodological procedure of the work, the specific methods

applied, the thesis's reliability, ethical considerations, my positionality, and the work's limitations will be presented.

4.1. Philosophy of science

Ontologically, I will follow Tetreault (2017), who identified a third form of political ecology additional to the materialist and poststructuralist approaches to the field. This third form "takes into consideration both the materialist and symbolic dimensions of evolving nature-society relations and social conflicts" (Tetreault 2017, 19). Tetreault thus echoes Escobar's (1999, 3) call for

> a more balanced position that acknowledges both, the constructedness of nature in human contexts […] and nature in the realist sense, that is, the existence of an independent order of nature.

This approach is consistent with Roy Bhaskar´s (2013) critical realism, which recognises that there is objective reality, but that human perspectives on it are socially constructed. Hence, this work is to be understood within this ontological classification and as aligned with the view that "social reality is held to be a constructed world – one of compromised, shared meanings – but underpinned by constitutive processes that require elucidation" (Frauley and Pearce 2007, 16 f.). The material landscape conditions of Lusatia, but also biophysical phenomena such as climate change are therefore understood as real, while the perspectives on them, the perception of being affected by them and the political reactions to them can be perceived as socially constructed.

4.2. Data collection

I chose methods which gave room for the interviewees to tell stories and to introduce me to their local landscapes. In semi-structured interviews I aimed to generate rich and detailed answers, to put the interviewees' points of view in the centre, and to be able to stay responsive to the direction in which interviewees might take the interview (Bryman 2016). Additionally, the interviewees were asked to bring two artefacts to the virtual meetings in order to stimulate storytelling and trigger memories (Creswell and Poth 2018). In walking interviews, the interviewees were (re)visited in their local landscapes in Lusatia. The aim was to trigger storytelling through the sensation of familiar (energy) landscapes and to interweave stories with material ground (Evans and Jones 2011). Consciously, I travelled the distances between the walks by bicycle to gain a personal understanding of Lusatia´s (energy) landscapes.

4.2.1. Sampling

A gatekeeper approach was followed for the selection of interviewees (Bryman 2016). I sent out 10 e-mails to gatekeepers represented by regional workers' union offices of the IG BCE and IG Metall, as central elements of class-formation (Candeias 2021) in which most of the lignite workers are organised, and to several offices of Lusatian city councils like those of Spremberg, Welzow, Weißwasser and Cottbus. Six people responded and expressed their support for the study. Amongst them were the mayor of Spremberg and one person working in corporate management for LEAG. Both were interviewed, but

their interviews were not included in the analysis as they did not fit the focus on the workers' perspectives. In addition, the aim was to keep the sample small in order to strengthen the thesis' narrative character and to give space to the individual stories of the workers in adequate depth and thoroughness (Creswell and Poth 2018).

Table 1: Overview of interviewees and informants

Anonymisation of interviewees	Previous and current occupations (with relevancy to this thesis)	Types of data
Informant 1	Wrote diploma thesis on resettlements due to expanding mines in Lusatia	Hand-written notes of phone-call and access to study and data
Informant 2	Former miner in open-cast lignite mine	Hand-written notes of phone-call
Informant 3	Mayor of Lusatian city	Online interview and artefacts
Interviewee 1 - Dietmar Kobjela	Electrician at lignite-fired power-plant	Online interview, artefacts and narrative walk
Interviewee 2 - Rainer Schmidtke	Miner in open-cast lignite pits vocational mining trainer in a training workshop	Online interview, artefacts and narrative walk
Interviewee 3 - Mathias Kohl	Machinist for large open-cast mining equipment (Maschinist für Tagebau-Großgeräte) Head of Department for Economy, Structural Change and Digitalisation at the City Administration	Online interview, artefacts and narrative walk
Interviewee 4 - Jan Winkler	Electrician at lignite-fired power-plant	Online interview, artefacts and narrative walk
Interviewee 5 - Melinda Lehman	Corporate management for LEAG	Online interview, artefacts and narrative walk
*Interviews included in the analysis are greyed out		
** Interviewees' names have been replaced by pseudonyms		

4.2.2. Qualitative interviews and artefacts

Semi-structured interviews were used to collect data relevant to the research questions. This approach was chosen as it offers the freedom to embark on the research with initial research ideas and to follow the interviewees' input in order to gain expert qualified and relevant knowledge in relation to the topic (Bryman 2016). Semi-structured interviews enable an interview format which not only helps the listening, observing and encouraging interviewer (Charmaz 2006) to maintain an overview of the field situation, but also gives the interviewee a sense of stability. In the preparation of the interviews, an

interview guideline was elaborated consisting of open-ended questions, allowing interviewees to deviate and expand freely. To ensure the questions were relevant and applicable, the field was explored first by speaking to two women who had researched the subject (Informant 1) and had completed a course of training in a Lusatian open-cast mine (Informant 2). The interview questions were complemented in the course of the research to address and test patterns identified in previous interviews. The interview guide (see Appendix I) consists of three parts (Bryman 2016): initial questions on the interviewee's past; intermediate questions about their present relation to their work and surrounding landscapes; and ending questions about the future of their lives, jobs and future prospects of Lusatia as lignite and energy region. Prior to the interviews, the interviewees were asked to bring two artefacts to the interviews – one that symbolised their life in Lusatia as an energy region/landscape, and one representing their experience of the coal phase-out – and elaborate on them. The interviews were all conducted in German and took from forty-five minutes to almost four hours. Timings were dependent on the interviewee's time and input. All interviews were recorded with the given consent of the interviewees. A postscript was prepared after each interview conducted (see Appendix II), embedding the interview in the social and spatial context. The interviews were transcribed verbatim following the basic transcript approach of Kruse (2015).

4.2.3. Walking interviews

Walking interviews have gained traction as a method of exploring ways of perceiving spaces in situ and through direct experience (Evans and Jones 2011). Evans and Jones found that

> [w]alking interviews tend to be longer and more spatially focussed, engaging to a greater extent with features in the area under study than with the autobiographical narrative of interviewees (Evans and Jones 2011, 856).

I therefore assessed walking interviews to be an excellent complement to the virtual autobiographical interviews, enabling the interviewees to embed their stories into their material surroundings. In the context of the walking interviews and from a critical realist perspective, space was understood as a situationally emerging network of relationships that arises from social practices (Kühl 2015) on material ground. This should enable the social and ecological constitution of the energy landscapes to be revealed, the spatial aspects of change to be embedded within temporality in people's life stories, and thus a contemporary and historical reality to be reconstructed. In preparation for the walking interviews, the interviewees were asked to think of one or more places that either have a significance for the upcoming energy transition or are related to their current work. The meeting points were announced by the interviewees in advance (fig. 2) and dates and times were agreed upon. In the unstructured interviews the interviewees were given space to react freely to impressions of the landscape. Follow up questions were asked, informed by the landscapes and the prior virtual interviews. The conversations during the walking interviews were recorded with the consent of the participants and subsequently transcribed. During the walks, pictures were taken by the interviewer of highlighted landscape features. The

interviews lasted from forty-five minutes up to five hours, depending on the time and motivation of the participants. One walk involved cycling long distances and included a tour of the Boxberg lignite-fired power plant (fig. 3). In another interview, I stood with the interviewee at a viewpoint the whole time (fig. 4).
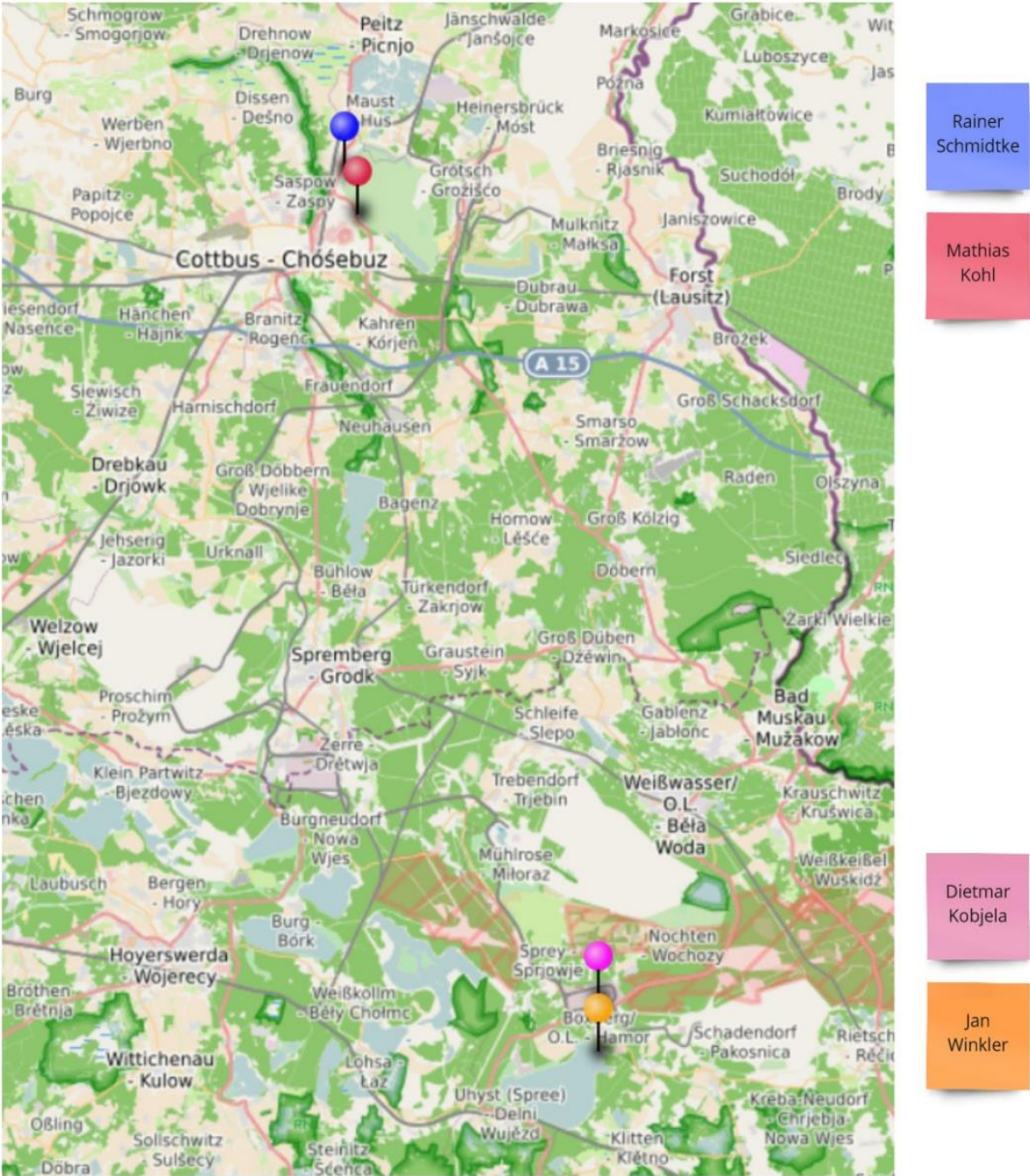
Figure 2: Overview of places where walking interviews were conducted, 1:5km, Source: Open Street Map, 2021
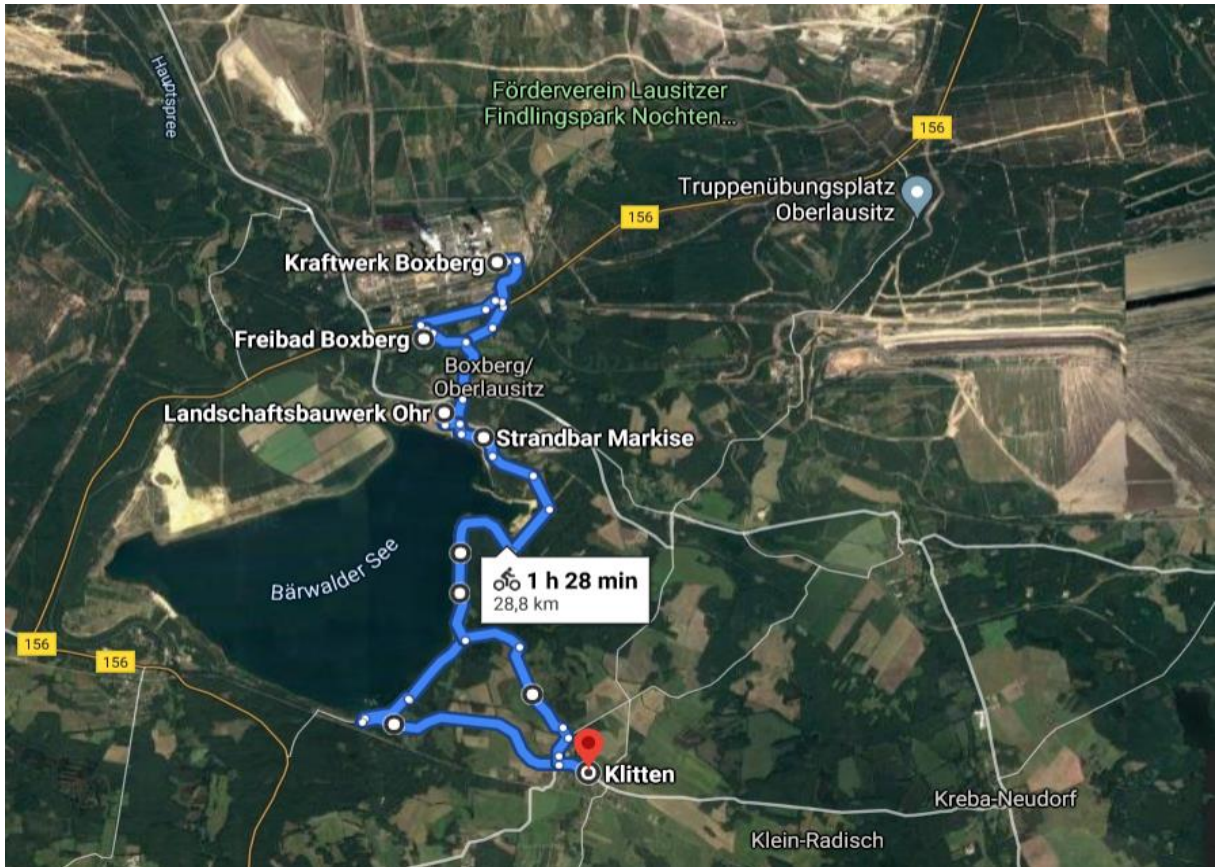
Figure 3: Narrative walk with Dietmar Kobjela, 1:2km, Source: Google Maps, 2021

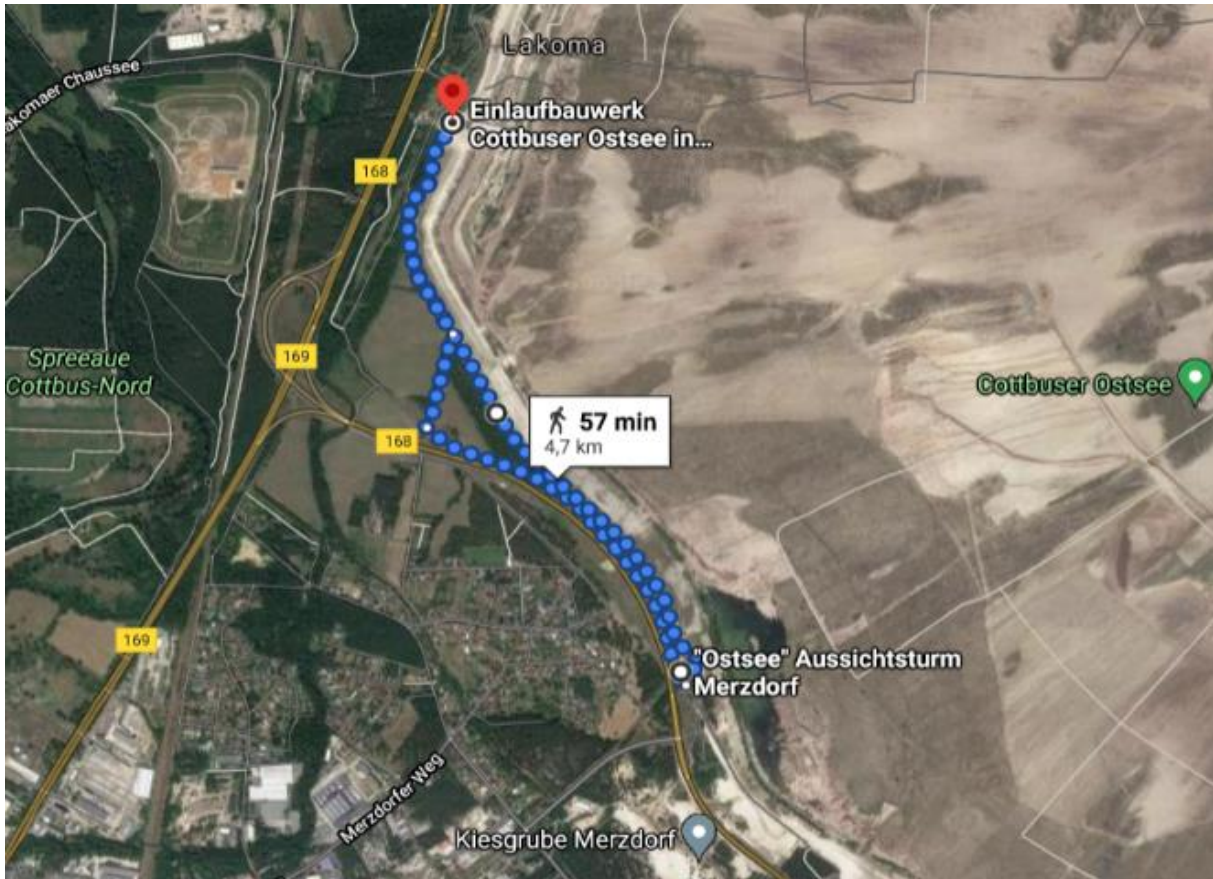*Figure 4: Narrative walk with Rainer Schmidtke, 1:100m, Source: Google Maps, 2021*

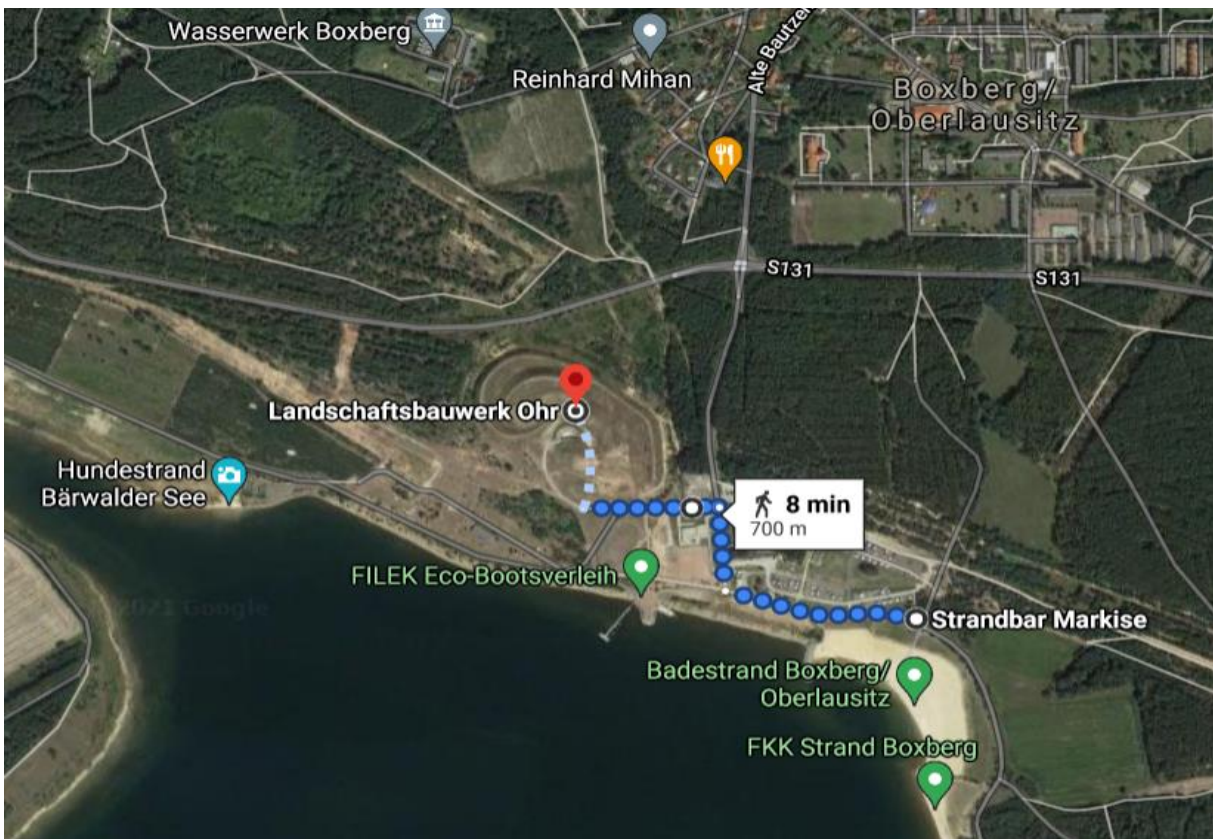*Figure 6: Narrative walk with Mathias Kohl, 1:500m, Source: Google Maps, 2021*

Figure 5: Narrative walk with Jan Winkler, 1:200 m, Source: Google Maps, 2021

4.2.4. Analysis

The analysis was conducted thematically, employing the developed theoretical energy identity framework "as a resource for interpretation of spoken […] narratives" (Riessman 2008, 73). A thematic approach in narrative research is known for appealing to novice researchers who work with narrative data for the first time as it appears intuitive and straightforward (Riessman 2008). Thus, I retold the stories of the interviewees focusing on their energy epistemics, energy landscapes perceptions and justice claims. Additionally, in the analysis, I followed the three-dimensional space approach of Clandinin and Connelly (1990). This included the analysis of data according to interaction (personal and social), continuity (past, present and future) and situation (physical places or the story-teller's places) (Connelly and Clandinin 1990, 9). I conducted the analysis as described below: first, the transcribed interviews of one person were divided into sections of meaning and labelled with summarizing labels. These were condensed into codes by iteratively reading the data (online interviews, artefacts, walking interviews, photographs) of a person. The codes were then thematically identified and assigned to the categories of energy epistemics, energy landscapes and energy justice claims (including distribution, recognition, procedures). Following, the codes developed within one person's data were compared with those of the other persons to check where significant similarities and differences existed, in order to identify the most relevant codes for the research questions. Using Clandinin and Connelly's (1990) three-dimensional approach, narratives were woven from the developed codes. In the written narratives, many direct quotes which were crucial for the developed codes were purposefully included in order to present the story as intactly as possible and to strive to preserve the initial meaning (Riessman 2008). By inserting visual data of the artefacts and the landscapes into the analysis, I aimed to complement the stories with a materiality which is accessible to the reader.

4.3. Reliability and validity

The first approach to uncovering a researcher's bias is engaging in reflexivity (Creswell and Poth 2018). This is crucial, especially for narrative research, because the researcher's personal and political background can easily be written into the retelling of the stories (Creswell and Poth 2018). Hence, I tried to approach my own and prior knowledge as reflexively as possible and was aware of it during the research process. The story of my inspiration to write this thesis told in the introduction and the subsequent section on self-reflexivity aim to contextualise my background for the reader in order to make results and procedures more comprehensible. Through the use of different methods (virtually conducted semi-structured interviews, artefacts, walking interviews and landscape observations) the effects of triangulation could be used. By condensing the stories from different perspectives of the interviewees and interweaving the different, partly overlapping or complementary storylines, more compelling stories could be told in a wider context. Czarniawska raises awareness of the "authorial responsibility" (2004, 63) that arises with collecting, analysing and telling individual stories, and

Pinnegar and Daynes pose questions about power and authority by asking "Who owns the story? Who can tell it? Who can change it? Whose version is convincing? What happens when narratives compete?" (2007, 27). Therefore, the validity of the results was cross-examined with peers in a supervisions session which provided the opportunity for validation through the reviewer's lens (Creswell & Poth, 2018).

4.4. Self-reflexivity

As a woman who grew up in Germany, I am familiar with the most crucial cultural conditions of the country and can communicate without any problem. Also, I have a personal attachment to the GDR as my mother and her family is from the former communist country. Additionally, I grew up in Berlin, not far from Lusatia, which can also be considered helpful in gaining the trust of the local people. Nevertheless, there are also many circumstances that divide me from the realities of the lignite workers in Lusatia. Growing up in the capital as the daughter of two academics in an economically secure household, my experiences are likely to differ from those of the lignite workers. My academic and activist background may also cause scepticism. Especially in the overlap between scientist and activist, it must be emphasized, as Piven argues, that I am in a privileged situation (2010). I am not directly affected by the direct environmental impact of lignite mining, nor am I dependent on a job in the sector. My goal is therefore not to see myself as a "martyr" (Piven 2010, 810) for the good cause, but to give space to the marginalized voices.

4.5. Ethical considerations

As the focus of this research is on the lives and narratives of workers employed in the lignite industry in Lusatia, the research includes sensitive topics such as the interviewees values and beliefs, insights into their present and past, family stories, political opinions, membership of trade unions, and other elements of their identity. Therefore, it was essential to exercise utmost sensitivity in the preparation for and undertaking of the interviews, the collection of stories told about the artefacts, and the walking interviews. The participants themselves decided what they wanted to disclose in the interviews and the data collected was thoroughly anonymised before being included in the work. Within the framework of the guideline for qualitative ethical research issued by Lund Univeristy (Lunduniversity.lu.se 2015), the interviewees were informed and asked to sign a consent form before the research began (see Appendix III).

The interview guide was sent to the interviewees prior to the interviews, and the opportunity given to express concerns or questions. The data collected during the research process was stored on Microsoft Office home drives in order to conform to GDPR requirements. The data which is included in the final thesis has been anonymised so that the individual is not identifiable, and the interviewees' names have been replaced by pseudonyms. Throughout the process, consideration was given to creating supportive, respectful relationships without stereotyping. Power relations between researchers and those being studied were always kept in mind and reflected upon.

4.6. Limitations and omissions

Given that the thesis represents the narratives of four workers employed in Lusatia's lignite sector, the depth of the narratives had to be compromised and condensed. I found it nevertheless important to include the stories and perspectives of four people in the work in order to generate a plurality of energy epistemics, landscapes perceptions and justice claims as part of coal workers' identities. My aim in this decision was to lay a foundation for further research. Four was perceived as a reasonable number of interviewees, given the length of the paper and the compatibility with the narrative research approach.

Another limitation is the translation of the interviews into English. Many words are context-specific and come from highly technical areas (mining, power plants) that are culturally charged with connotations that the English language may not be able to convey. Therefore, by translating the interviews from German into English, the meaning may have been changed. Additionally, in order to prevent myself from influencing the content too severely, I first roughly translated the text using the translation software DeepL before adapting it.

Through the thematic narrative approach and writing of the analysis, meaning and content can be lost through retelling by the narrator, and the role of the researcher in the text tends to remain unclear to the reader (Riessman 2008). Through thematic analysis and working with preconceived categories, contexts can be lost and the specifics of meaning in context can be obscured (Riessman 2008).

Another restricting element of the thesis is the sampling approach. The employed sampling approach limited the participants to those organised in unions, and those who have access to and feel comfortable with reading and responding to e-mails. In addition, the chosen research procedure required a lot of time from the interviewees. It was striking that all interviewees were very socially engaged and genuinely motivated to participate in shaping Lusatia's future. For further work, however, it is worth considering adapting the research methodology so that fewer hurdles are posed and that people who feel even more neglected in the procedures of the coal phase-out can also be reached.

5. Analysis: Narratives of coal-workers' energy identities

Based on the theoretical framework developed in the theory chapter (chapter 3), the energy identities (fig. 7) of the interviewees will be presented. I will retell their narratives following the three dimensions in the order in which the walking interviews took place – starting with Diemar Kobjela and concluding with Jan Winkler.
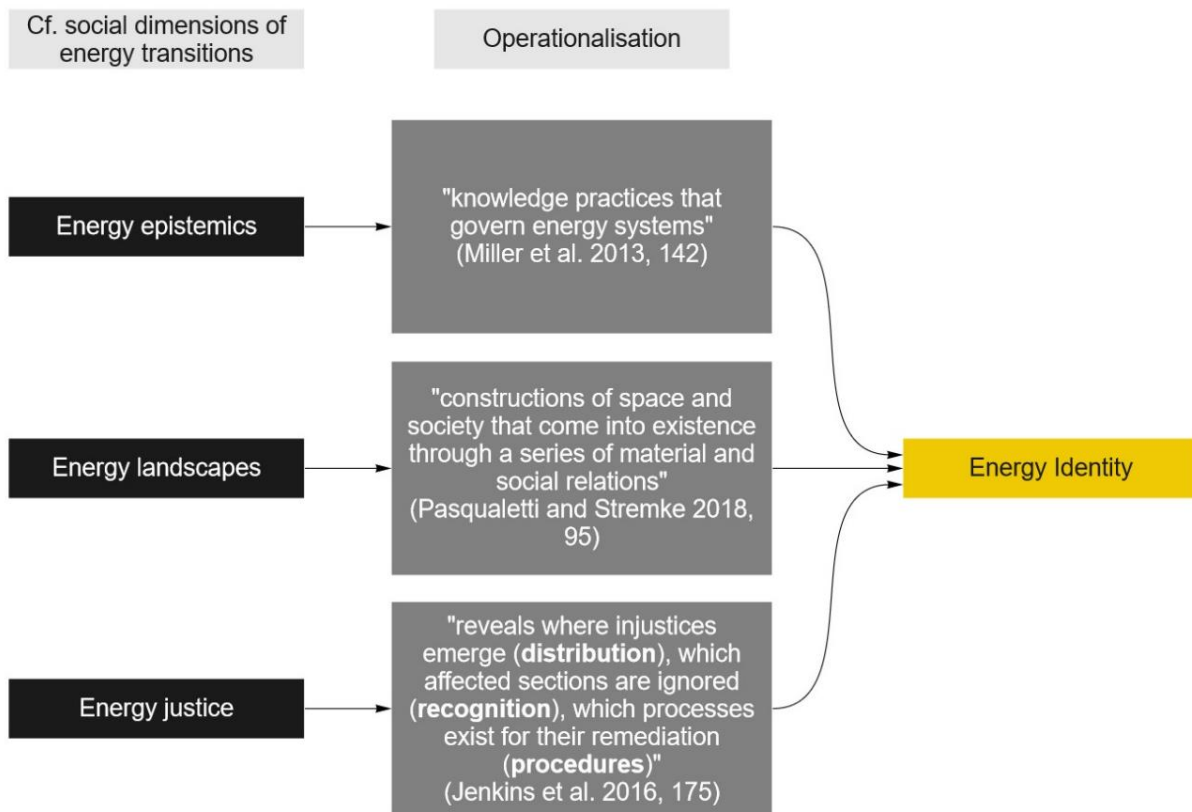
Figure 7: Energy Identity Framework

5.1. Dietmar Kobjela

Dietmar Kobjela was born at the end of the 1950s and grew up in what is now the municipality of Boxberg. After finishing 10th grade, he began training to become a technician for industrial measurement, control and regulation technology and planned to complete his Abitur (A-levels). However, he was denied a place for the Abitur because he was involved in the church instead of the Freie Deutsche Jugend (FDJ) [3]. After his training in Boxberg, he was employed as a control mechanic and has since been working in the Boxberg power plant.

5.1.1. Energy epistemics

Dietmar Kobjela "enjoyed a very good education" in the then newly built Boxberg training centre. He experienced his work as a control mechanic on shift as very socially enriching. In the socialist organisational structure of the power plant the workers were divided into shifts or brigades, as it was called in the GDR jargon. This made the division between work and private life blurry. Kobjela and his colleagues shared their interest in technology and culture during their free time. They organised evenings to compare their stereo systems, Pentacon cameras or went to concerts and exhibitions. They kept a diary (first artefact, fig. 8) of their shared experiences as a brigade, which the power plant's cultural

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[3] The FDJ (Free German Youth) was the GDR´s only recognised mass youth organisation. The communist organisation was the complementary to the schools' educational system.

committee reviewed at the end of each year. Working as an electrician Kobjela bore great responsibility: "So you had to have reliable people working there, otherwise there would probably have been death tolls". In general, the plant's energy output played a decisive role for the power supply of the GDR. Nowadays, Kobjela is frustrated by the hierarchical structures' blocking of innovative ideas. For example, his proposal to plant a wildflower meadow around the power plant to foster biodiversity and save lawn care costs was rejected on the grounds that the pollen would clog the power plant's filter systems. He is also annoyed by how inefficiently the Jänschwalde power plant is currently being operated and how much energy is wasted in the process. Many people employed by LEAG have "lignite heads", he says, and preconceived opinions. Kobjela is uncertain about future solutions for maintaining grid stability without coal-fired power plants. He is also concerned that coal-fired power generation will be unprofitable by 2038 because of the CO_2 certificates: "On the one hand, the electricity is needed, but on the other hand we can no longer produce it effectively. That is a contradiction - something has to happen".
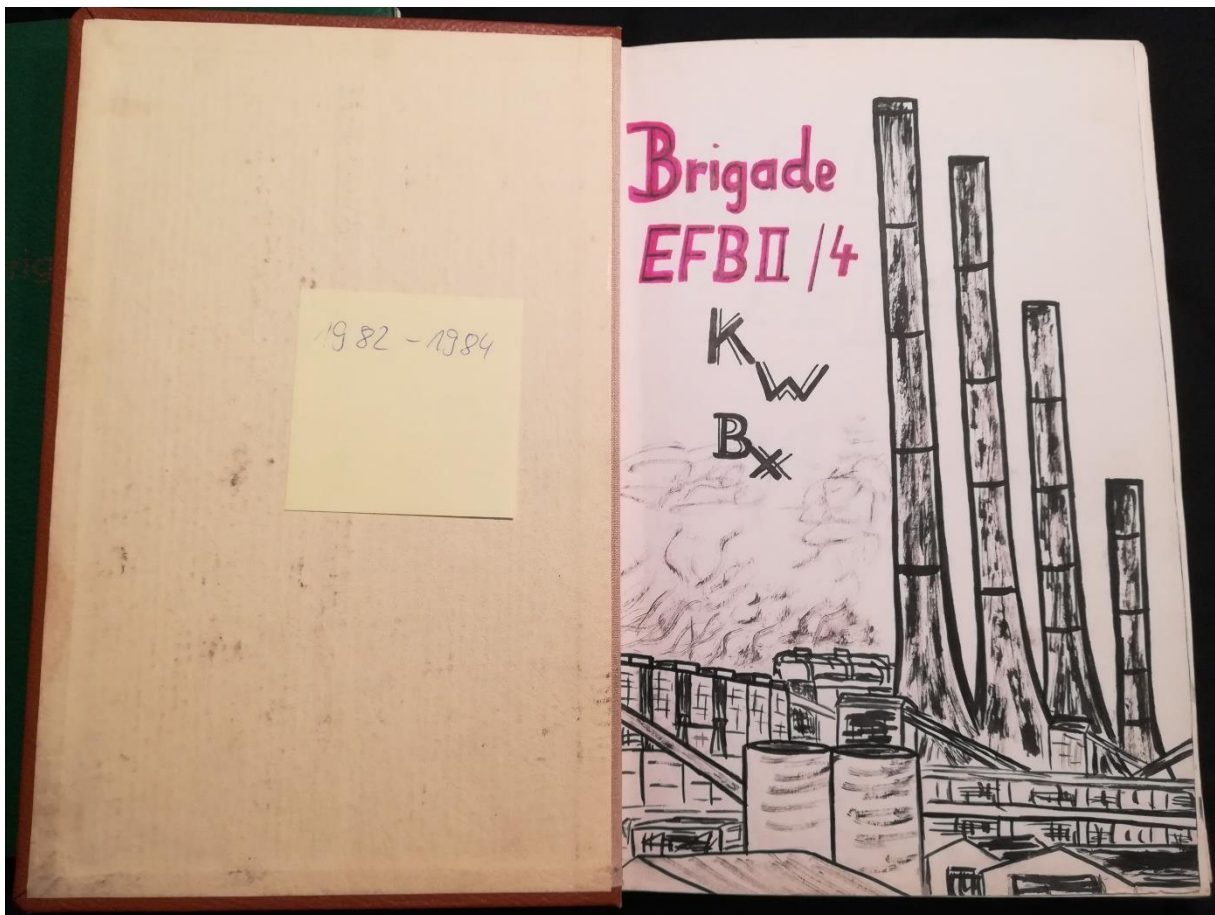
Figure 8: Diary of the interviewee's power plant brigade from 1982-1984 (anonymised). Photo taken by the author, 2021

5.1.2. Energy landscapes

Figure 9: Former Bärwalde outdoor swimming pool. Photo taken by the author, 2021

Figure 10: Abandoned cooling-towers in front of still operating cooling-towers at the power-plant in Bärwalde. Photo taken by the author, 2021

Kobjela has known Bärwalder See as a forest, a coal mine, and now as a lake. It is remarkable how each landscape has a different meaning for him and is associated with different stages of his life and emotions. Before the sitings for the mine began in the 1960s, Lusatia was the "largest contiguous forest area that existed in Germany [at that time]", Kobjela tells me. As a child and teenager, he played in these "primeval forests" with "really thick beech, oak and pine trees". There were ponds and fields, and in winter the ponds "all froze over and there was really thick ice on them [...] and then we went ice skating". As Kobjela grew older, the open-cast mines were excavated and moved from both sides towards the village where he lived. The residents were "mostly positive" about it because "most of them had worked [...] in the opencast mines". But when the village was to be destroyed due to the underlying lignite shortly before the fall of the Wall, Kobjela and other residents joined in the resistance. Kobjela's associations with mines are mainly negative. He even admits:

> It hurts me when I go to the open-cast mine [...] and I know that in the end I am partly to blame for the whole thing because I also helped to ensure that the coal that is mined there is burned and turned into energy.

Kobjela perceives the region as peripheral where, apart from the power plant, there are no well-paid jobs, little culture and poor connections (rail network, roads) to the nearest larger cities. Interestingly, Kobjela describes the landscape, still dotted by the opencast mines, as beautiful and with an "appearance that is second to none". For him, the total destructiveness of open-cast mines and the abundance of nature can co-exist. In the story he told me about the former open-air swimming pool in Boxberg (fig. 9), to which he took me during the narrative walk, the close connection between the power plant, public infrastructure and his emotional connection to both becomes visible. The open-air swimming pool was very popular at the time; it was heated by the waste heat from the power plant and is where Kobjela's children learned how to swim. The pool went bankrupt after the fall of communism, the shutdown of the oldest units of the power plant (fig.10) and the flooding of the Bärwalder open-cast mine. The operators of the plant demanded money for the heating due to increasing competitive pressure and people began swimming in the Bärwalder See instead of paying for the open-air pool. It has since been closed down and turned into a park. Kobjela misses it. He would swim "no matter what the weather was like, […] into the warm water here in the open-air pool". Nowadays, the Bärwalder See also has recreational value for Kobjela. He has the "luxury" of cycling to work along the shore, goes "for a swim after work", paddles out with his stand-up paddle or "goes for a walk". "Something really good has come out of the Bärwalder open-cast mine", he said.

5.1.3. Energy justice

The lignite brought wealth to the region. Kobjela tells me that Boxberg, the municipality where the power plant is located, was once the "richest municipality" in unified Germany. Even in the GDR, it was evident from people's houses that the region was more prosperous than most others. The prosperity of the region disappeared with the reunification but the workers at LEAG continue to be economically well off. Nevertheless, Kobjela describes the region as being poorly connected, with only the elderly staying as the young seek jobs elsewhere. Kobjela sees solutions for a continued equitable **distribution** of resources by making the region more attractive through "tourism" or "research institutions on e.g. hydrogen". He disapproves of the idea of converting the coal-fired power plant into a sewage sludge incinerator: "Let them burn their sewage sludge where it is produced". Instead of continuing with dirty technologies, he wishes "that the people who live here continue to have an adequate income, [...] that there continue to be people here who start families, who want to live here and who like it here".

Kobjela describes various tensions between **recognition** and marginalisation. For example, he tells me about the last relocations in his region for the expansion of the Nochten open-cast mine. There was resistance, but "they had compensated them so well that I think only the real nature lovers then probably fought". Workers were not recognised in the restructuring of organisational structures at the power plant in the same way as people in managerial positions. This leads to "competitive thinking" among the workers and a mood of resignation, because "the tenor is actually that […] we can't influence that

anyway". This is due to the fact that "so much went wrong after the fall of communism", Kobjela says. Someone who is definitely recognised by the state and receives state compensation is the power plant operator: "the poor guy who owns the power plant, he has to be compensated somehow", Kobjela laughs sarcastically. Actually, Kobjela is more afraid of the region's right-wing turn than he is of the power plant shutdown. He says "that in large parts of the population there are extreme right-wing or radical right-wing thoughts [...] - even among the police and the state apparatus". He feels as though his opinion is in the minority and is even afraid of being "beaten up".

Kobjela describes a complex portrayal of different structures and **procedures** that determined his demands for justice during his time at the workplace. In the GDR, the organisational structures were shaped by the state and thus the Sozialistische Einheitspartei Deutschland (SED)[4]. Kobjela sees these structures as being partially continued. There was no "coming to terms with the past" after the fall of communism. Also, during the dismissals at the time of reunification, SED functionaries secured jobs for themselves while others were dismissed. It is still similar today: "the managerial positions have not been abolished, so the managers stay and the staff are somehow restructured and the work remains the same". Although Kobjela feels that trade union representation is generally very important, he does not feel represented by the trade union's work in the power plant. He withdrew his membership following cases of corruption and trials to delay the coal phase-out, rather than search for alternative solutions. There is also no commitment from the employees to jointly engage in a search for solutions. Instead, there is a "mood of resignation". Few trust political decisions. Kobjela believes that it is the workers' responsibility to get involved politically and to stand up for their rights and visions. He is glad that he no longer has to speculate what will happen to his professional future as he will soon retire. He also believes that the phase-out in 2038 is not feasible, but that due to rising CO_2 prices, "the power plant will probably be uneconomical before then".

5.2. Rainer Schmidtke

Rainer Schmidtke was born in Dresden in the 1960s and then moved with his parents to Lusatia. There he completed his Abitur with simultaneous training as a machinist. For 30 years he worked as a miner both underground in copper and slate mines and above ground in Lusatia's coal pits "directly on the front line" before starting as a trainer for metal technology and hydraulics at LEAG, where he still works today.

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[4] Socialist Unity Party of Germany (SED) was a Marxist-Leninist party that emerged in 1946 in the Soviet occupied zone of Germany from the forced unification of the SPD and the KPD and subsequently developed under Soviet influence into the cadre and state party of the GDR, founded in 1949.

5.2.1. Energy epistemics

Figure 11: Blackout Box issued by IG BCE as a promotional item against the closure of the power plant units in Jänschwalde. Photo taken by Rainer Schmidtke, 2021

Figure 12: View over the Ostsee from the Lakoma flooding construction. Photo taken by the author, 2021

Rainer Schmidtke saw his work in the mine as being tough. It was "a lot of physically hard work, you had to get up early" and the shifts went on for 10 hours and "hardly anyone" wanted to do it. Schmidtke speaks the miners' language and thinks it is a pity when "colleagues shout good luck (Glück auf!) but don't know whether coal is being picked or harvested". He sees mine workers being less valued than power plant workers and posits that miners sometimes had a lower level of education and were the ones who "came up from the shift black as coal".

Rainer Schmidtke is clearly in favour of coal-fired power generation and devalues renewable energies such as wind and solar power, but also nuclear power. "You need heavy rotating generators to maintain the frequency, you can't do that with wind turbines [...] and with solar neither." Outside of Germany, there would only be "junk [atomic] piles" feeding into the European grid. He fears blackouts if Germany phases out coal and therefore has an "emergency generator with" him:

> I can only tell you about the winter of 2010. I had to go digging in the pit on Christmas Eve. [...] We had minus 30 degrees, we had a [...] typical winter high-pressure situation. We [...] had no wind, it was hazy all

day […] and the nuclear power plants went off the grid [and] the hydroelectric power plants, too because they could no longer cool and because everything was frozen. We still had to supply France and Sweden at that time [...] and that's where we're supposed to get our electricity now [...]?

He supports his words with the small blackout box (fig. 11), his second artefact, which symbolises the coal phase-out for him. Schmidtke denies anthropogenic climate change by saying "the climate has always been changing". He is "sceptical" about the public media because there is a lot of "word-framing" and "manipulation" and he has become "very alert, because I am also older, more mature and a bit smarter". He believes that technology offers new solutions: "And what should we do now? Do we switch everything off? Do we crawl back into the cave or do we do something technological?".

5.2.2. Energy landscapes

Schmidtke's descriptions of energy landscapes are congruent with his epistemics. He devalues the scenery prior to the opencast mines: the soil was sandy and nothing grew except pine trees. Nowadays, due to the opencast mines, "Brandenburg is the state with the most lakes". The recultivation of opencast mines (fig. 12) creates "beautiful lakes" and "biotopes" where "very rare bird species [...] settle". His description of the mines whilst still in operation is ambivalent. On the one hand, he paints a picture of scary places "with noise and lights everywhere [...], it didn't look so bad from a distance, but it's all so huge and enormous". They "eat away" at cities, have adverse climatic conditions, still cause damage to e.g. roads through drainage and subsequent landslides and displace people owing to their expansion. On the other hand, he also describes the symbiosis between hawks and excavators, and mentions that people benefit from resettlement schemes because they are so well compensated. Schmidtke devalues renewable energies in terms of landscape design (fig. 12) but also in terms of their performance. He comments enthusiastically:

> My heart beats faster when I see a conveyor bridge or a coal excavator [...] when I see the cooling towers [...] where the process steam rises vertically upwards [...] then I know that we are fully connected to the grid again and the world needs us because renewables are once again unable to provide.

He describes that many people living in the region are used to coal and have worked in the industry themselves. In addition, in everyday life people "didn't notice anything about the mining industry". He says there is no room for new infrastructure such as the newly planned medical university: "We don't have any space for it, a faculty has a research area and all that - that's a lot of buildings".

5.2.3. Energy justice

Figure 13: Schmidtke's helmet under Vattenfall. Photo taken by Rainer Schmidtke, 2021

Figure 14: Schmidtke's current helmet under LEAG. Photo taken by Rainer Schmidtke, 2021

Schmidtke criticises the wind turbines that are being erected and complains about stroboscopic effects, infrasound and noise levels. By saying, "I would like to put up a wind turbine in the Volkspark Friedrichshain [in Berlin]" he makes a **distribution** problem visible. In Berlin, electricity is consumed but not generated, yet decisions are made there.

Schmidtke thinks that the need for well-paid jobs of power plant workers and miners is not sufficiently **recognised** in the energy transition. During our online interview he emphasised nine times that he earned "good money" at LEAG. He says that there is a lot of synergy between mining and coal-fired power generation and other industries in the region "and if the people here don't have well-paid jobs, then there will be no turnover anymore". He does not support the plans to build a medical university and research institutes, because "money is earned where added value is created". Schmidtke adds that many of the promises made so far are "drivel". The shutdown of two units at the Jänschwalde power plant has led to the loss of 600 jobs and "only eight" new ones have been created in a call-centre.

Schmidtke disapproves of the decision-making **procedures** regarding production conditions and the time frame of policy structures, accompanying the lignite phase-out. He no longer feels represented by his union because when the chairperson of the IG BCE starts "tinkering with our future together with Green politicians, I get a bit scared". He feels constrained by the restructuring within recent years. He chose two helmets (fig. 13 & 14) as his first artefact to describe his life in Lusatia's energy landscape and the five changes of employers (Vattenfall and LEAG logos on the helmets) during his time at the company. He states that whenever something changed "somehow a colleague was missing left and right". The company has been affected by constant changes and job cuts since Germany's reunification. Schmidtke is frustrated by the negotiations of the coal phase-out law. He described the politicians as

"unreliable" and that they were always "renegotiating". Nowadays, for him it is not possible to "make plans" due to the operating times of the power plants being reduced without "sense and reason".

5.3. Mathias Kohl

Considering that Mathias Kohl was born in the "coal region" in the 1960s, working in the coal sector was an obvious choice. However, he initially decided against doing so: "My grandmother actually wanted me to become a forester, [...] I preferred to become a carpenter". But since a carpentry apprenticeship was not available in combination with accomplishing a high school diploma, Mathias decided to do an apprenticeship as a machinist for large-scale opencast mining equipment and complete his Abitur. In the 1990s, he decided to study environmental sciences. He no longer saw a future for himself in the mining industry and was aware of his work's serious environmental impacts. Today he works for the city of Cottbus. His area of concern includes the region's structural change.

5.3.1. Energy epistemics

Mathias Kohl describes his time as an apprentice in the mine as "tough". "You started at the bottom of the hierarchy" and "you didn't have any fixed tasks, but mostly got the larry jobs". Due to the "dangerous activities", you were "dependent on each other", but you would also "support each other", which he has "never experienced since then". Still, he found the work as a machinist "monotonous" and "you had a lot of time on your hands". It was during these times that he carved the mask that he brought to our conversation as his first artefact (fig. 15) representing his days as a miner. In the GDR, the job was considered system-relevant and was honoured with the credo "Who is miner, who is more?". During reunification, mining capacities were drastically reduced. This recession also made Mathias reflect on his work: "if you keep mining coal for 30 years, then you'll be 50, what happens when the plug is then pulled - […] that's a really stupid age". Hence, he started studying environmental sciences two years after reunification. Having stopped working in the coal industry, he is reasonably confident about the coal phase-out: "We don't live self-sufficiently, [...] we are interwoven in the international electricity grids" and "if we succeed in finding a technical solution to energy storage, then I won't be afraid of renewables and our supply security". Nevertheless, he finds it "hypocritical" to phase-out coal

> because we are protecting the climate here and then sourcing coal-fired or nuclear power from elsewhere, whether from France, Poland or the Czech Republic, meaning that what we don't blow into the atmosphere will be blown into the atmosphere there. But we have given up industrial jobs.

 Yet for Kohl the time of coal has come to an end, which he illustrates with the artefact of the scrapped excavator shovel (second artefact, fig. 16). Anyone who thinks otherwise is "backward-looking". Nevertheless, he values his knowledge as a machinist for large-scale opencast mining equipment. "I understand everything that goes on there. I still know all the mining methods. I still know what high cut,

low cut etc. means". Nevertheless, he is "worried that [the coal industry] is phased-out and [new jobs are] not there yet, [...] – the timing has to fit".

Figure 15: Mask carved out of lignin by the interviewee during shift in mine. Photo taken by the author, 2021

Figure 16: A piece of an excavator shovel after demolition. Photo taken by Mathias Kohl, 2021

5.3.2. Energy landscapes

Kohl describes the interconnectedness of people and landscape: "It is obvious that if you lived in the energy capital of Cottbus, you also worked in the coal industry". Yet there are still "emotional legacies" among people who have never come to terms with the expropriations caused by coal mining. He is simultaneously fascinated and deterred by the mines. Growing up, he could hear the coal trains passing by his house at night. In his third year of training, he said that it saddened him that they "dredged over their own vocational school – in the pre-cut". He calls the holes of extraction "moonscapes" and explains that "it was actually the destruction of landscape, the taking away of ancient ecosystems, even the [...] resettlement of people [...], that led to his change of profession". Nevertheless, he is also impressed by what was achieved by the "little people". He also tells how a bucket-wheel excavator left an impression on him "because it [...] was the only bucket-wheel excavator I saw in my life that was working in the so-called deep cut". He says that the landscape has changed with the operations of coal-fired power generation and that since the 1990s pits have been gradually closed and the opencast mining equipment scrapped. For the future of Lusatia, he hopes that it will also be perceived beyond the region as a place with a "high quality of life" and no longer as "dirty". He sees a positive link between the past, present

and future in the emerging lakes (fig. 17). Many people, both miners and residents, could identify with them. Standing in front of the Ostsee he tells me that he knows all three stages of the area, just like Dietmar Kobjela with the Bärwalder See. He has known the forest of his childhood, the mine of his early adulthood, and now he is part of creating a lake for the future.

Figure 17: Playboat 'MIA' endowed by LEAG, Cottbus Ostsee, Jänschwalde power plant (left), wind turbines (right). Photo taken by the author, 2021

5.3.3. Energy justice

In terms of **distributive justice**, Kohl is the only interviewee who mentions the effects of globalisation, saying: "But the workshops of this world are no longer in Europe". He emphasises that Germany is "one of the countries that consumes the most energy and raw materials" and that it must therefore be a pioneer in the energy transition. Continuing to source nuclear and coal-fired electricity from other EU countries is "not fair, it's rather hypocritical". On the narrative walk along the Cottbus Ostsee, he tells me that the distribution of economic, social and ecological costs and damages of the nearby houses and villages from the former Cottbus Nord open-cast mine will now be primarily turned into benefits. The property prices of the houses are set to increase immensely due to the planned lake and leisure environment. Nevertheless, the communities may also be subjected to the negative impacts of gentrification and the disintegration of established structures through new development.

Kohl draws an interesting connection between **recognition** and neglect. He emphasises that there has always been good money to be made in coal: "Even as an apprentice, I went home with more money than my father earned". But then Kohl talks about the elimination of the most physically demanding

tasks due to the coal phase-out. People who have jobs "that no one needs anymore" will be neglected: "Such as my profession, […] machinist for large-scale opencast mining equipment. Nobody needs those people anymore". The specialised workers or those who "sweat away" in the simplest jobs are the only ones he names as clear losers of the coal-phase outs.

Looking through the lens of just **procedures**, I was able to identify various challenges that Kohl addressed. For example,

> the crux of the matter [...] is that people at LEAG are on short-term contracts[...] because the conversion of lignite into electricity is simply not economically viable at the moment because of the CO_2 levy.

This means that the coal phase-out could "perhaps even happen much sooner, because it is simply no longer worth it". Kohl believes it is right to meet the climate targets, as long as the people are taken into consideration. In this context, the "reliability of the [politicians'] statements [...] is a very important element" of a successful structural change. Kohl emphasises that he is very happy about the agreement between the federal and state governments on the projects to be financed by the government for a successful structural change of Lusatia. The ICE connection and the medical university with public transport links are "a huge gift" for Cottbus.

5.4. Jan Winkler

Jan Winkler was born at the beginning of the 1990s. After finishing school, he heard back too late from the responsible authorities to start his planned police career. Thanks to advice from a friend, he then applied for an apprenticeship to become an electrician for operational technology at (then still) Vattenfall and started his training half a year later. "A decision I never regretted", he says.

5.4.1. Energy epistemics

Jan emphasises four times in the virtual interview that he received a "high-quality education" at the power plant's own training facility (fig. 18) The training was "very practice-oriented" and offered a basis for "further training courses that then helped for [life]". For this reason, and despite the upcoming coal phase-out, he still recommends that the children he trains in Judo should apply for training at LEAG. His story is supported by his second artefact; the judo belt (fig. 19). Jan did not think about the environmental impacts of lignite when he started his apprenticeship and due to the nuclear accident in Fukushima and Germany's "hard nuclear phase-out" in his second apprenticeship year he perceived coal as the main "energy provider". This attitude was changed by what he calls the "attacks" of Ende Gelände in Lusatia in 2016, which he sees as one of the triggers for the structural change in Lusatia and the coal phase-out law. In relation to the energy transition as a climate change mitigation strategy, Jan is indifferent. On the one hand, he says that "it was clear anyway that the end would come in the 2040s" due to the depletion of the Lusatian mines. Also, "there is no one at work who says that lignite is the thing". Nevertheless, he emphasises that coal is still needed at the moment because "all of a sudden, the

sun and the wind are gone [or there], and we have to take care of that"; lignite-fired power plants can compensate for grid fluctuations. He no longer reads the news because he feels that information is incorrectly presented in this regard "but you can't blame journalists; they are not trained electricians". In the interviews he twice describes blackouts as "horror scenarios" where respirators no longer work and underground trains in Berlin "suddenly come to a standstill in the dark – fully occupied". Jan tells me: "I like to listen to other opinions and I can accept them, so the best example is that I have a friend who is a Green voter" and emphasises his 'insider' knowledge by saying that she learns things through their conversations "that she would otherwise not learn, because for her, […] the electricity comes from the socket".

Figure 18: View from the roof of power plant block Q onto lake Bärwalde and the former Bärwalde vocational training centre (right). Photo taken by the author. 2021

Figure 19: Jan's black Judo belt. Photo taken by Jan Winkler, 2021

5.4.2. Energy landscapes

Jan's relationship to the energy landscape of Upper Lusatia was not pronounced until he started at LEAG. It was only when he applied for the apprenticeship that he realised: "Yes, man, that's actually right on our doorstep". Even though his grandfather was a steam train driver in the 1950s, "building up the Schwarze Pumpe power station, or what used to be this gas combine" Jan "never really had a connection to it". Back in his home town he says:

> it's relatively little [lignite infrastructure], because we're 35 kilometres away, the only thing that's a bit forgotten here […] is the […] reservoir. It was built directly for the open-cast mines and power plants during GDR times to prevent water shortage.

Whilst living in the apprenticeship school´s dormitory he enjoyed life with his friends. They would go "to the beverage store in Boxberg to buy us a few alcoholic drinks and lay down by the Bärwalder See". With his first artefact (fig.20), Jan emphasised his identification with his job and the energy

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infrastructures (fig.21). He proudly told me about the miniature cooling tower made by a colleague as a gift for his solution-oriented work. He is ambivalent about the opencast mines themselves:

> So, in one way it is breath-taking, because it is something you never see every day, and when you see the big equipment there, it is somehow blatant, on the other hand, of course, you see the cuts in nature, […] [but] when you see how the lakes are created afterwards, it is also something different from a meadow.

He believes that the key to structural change is the expansion of mobility infrastructure. In order to prevent people from moving away, as happened in e.g. Hoyerswerder or Weißwasser after reunification, the region has to be better equipped with rail networks and motorways with fast connections to cities like Dresden, Cottbus and Bautzen. He told me that a mayor he spoke to "attended a meeting of minister-presidents in Berlin and they wished him goodbye sarcastically: "Well, are you going back to the brown region?" – "brown" here referring to 'brown coal', and also commonly used in German to allude to a fascist mind-set. Jan told me that it is hard for him to live in a region that is devalued because of lignite mining and combustion, but also due to the increasing nationalistic sentiments and actions of its inhabitants.

Figure 20: Miniature cooling tower given as a gift in recognition of excellent work. Photo taken by Jan Winkler, 2021

Figure 21: View to the Boxberg power plant. Photo taken by the author, 2021

5.4.3. Energy justice

Jan also paints a complex picture when it comes to the **distribution** of environmental damage, emissions and access to energy. He does not see his current home as being shaped by coal infrastructure, and does not describe any negative impacts. The place where Jan and his family live is well connected to the transport network, which is important "in order to have the opportunity to do another job". He thinks it is unfair to be held responsible as a worker for the CO_2 emissions of coal, when other people drive the shortest distances by car or fly several times a year. He also sees the danger of renewable energy developments as only being commercial and questions the point of "our power plant" being switched

off when the rainforest "which is our lung" is being cut down in Brazil "and power plants are being built in Poland and China". Nevertheless, he says, "of course one country has to be a pioneer, but –".

In regards to the **recognition** of workers, he points out that due to current labour cuts, people are not only "getting more and more overworked" but processes or "occupational safety" also suffer. Besides, Jan is affected by the "bad image" that other people have of lignite workers. Furthermore, Jan emphasises that the energy transition not only has a big impact on the people who are permanently employed at LEAG, but also for those who work at other service companies: "We all have to have a future somewhere".

In terms of **procedures**, Jan thinks that production decisions are made without the workers or even against the workers. He describes the turnaround as accelerated by the actions of Ende Gelände, which he perceives as directed against the workers, and he feels that the state would rather protect the activists than the workers. Also, the "higher bosses [no longer knew] what you were actually doing down below". Nevertheless, he sees the communal political structures as being open for discussion: "You just have to have the guts, not just complain all the time". Jan thinks that "politics has done [the coal phase-out law] well". "They agreed on the date until 2038, if it's sooner, then it's sooner, and if they notice that it's not enough, they'll extend it". However, he is displeased that it is being debated again. He describes an inner restlessness in relation to the coal phase-out and the fear of falling into a financial "hole" due to being made redundant at some point. At the moment he has a job as a team leader in sight "and then we'll see". He laughs: "Well, I don't know exactly".

6. Discussion: Phasing out identities?

From the narratives of the four interviewees, a complex picture of identity-creating epistemics, landscape perceptions, and justice claims arising from work in the coal sector emerged. In the following, led by the research questions 'How does working in the lignite mining and coal-fired power sector shape the identity of workers in Lusatia?' and 'How can the coal phase-out consider these identities in a just and respectful manner?', I will recognise patterns in the narratives, discuss the findings with literature and reflect on the theory used. In doing so, I will answer the two research questions and contextualise my findings.

6.1. Lignite workers' energy identities

The lignite epistemics of the interviewees as well as their embedding in and perception of local energy landscapes revealed identity-forming elements. Not only did the coal workers' epistemics match their perceptions of the landscape, but I was also able to identify synergies between the knowledge that the interviewees drew from their work and education and their perceptions of the landscapes and vice versa, which ultimately shaped who they are, how they want to live and who they want to become (Bauman

1988). Growing up in the region, or the familiarity and spatial proximity of the coal infrastructure was the trigger for all of the interviewees' training in the sector. Throughout the training and the subsequent employment, knowledge was acquired that opened up access to labour practices but also to socio-material orders (cf. Pfister and Schweighofer 2018). These include complex social systems of mutual support (Kobjela & Kohl), traditions (Schmidtke), an own language (Schmidtke), societal recognition for the work (Kohl & Winkler) and the ability to shape, read, and identify with coal landscapes (all).

The identification with established landscape and knowledge regimes becomes particularly clear through breaks. The epistemics, but also the landscapes, are subject to constant change, which leads through the lives of the interviewees and influences them. Breaks in the narratives are described as changes in the landscape – from forest to open-cast pit to lake (Kobjela, Schmidtke, Kohl) – but also as social processes that determine shifts in epistemologies such as reunification (Kobjela, Schmidtke, Kohl), the nuclear phase-out (Winkler), the Ende Gelände action (Winkler), and the recently enforced coal phase-out law (all). These ruptures also have implications for their identities and the ways in which they situate themselves in the landscape and their social contexts. Supporting this argument, Kobjela, who is epistemically in favour of the phase-out, experiences a tension between the destructive dimensions of his work and his self-positioning as "green", and hence avoids getting close to open-cast pits. Kohl began to study environmental science, partly because he no longer wanted to be part of the destructive procedures. Schmidtke and Winkler see their perspectives as un(der)represented by politics and the media and thus question their accuracy, in order not to have to reflect on their own energy epistemics.

It also became apparent that the societal discourse shift around the perception of the miners' and electricians' knowledge and work determined their self-efficacy. In the GDR, the coal sector and its workers were honoured as being relevant to the system (Kobjela & Kohl), whereas today the industry and people employed in it were devalued because of its consequences for the climate (Kobjela & Kohl) and a lack of understanding about how energy is produced and energy systems organized (Winkler & Schmidtke). Luh and Staemmler (2021) also describe the loss of self-efficacy of coal workers due to the energy transition, and the corresponding lack of contribution to society through one's own accomplishments and knowledge.

Interestingly, coal infrastructures are portrayed as present and pervasive, while simultaneously blending to the point of invisibility with the lives of the workers. Pasqualetti and Stremke's (2018) finding that people accept the energy landscapes as "evolved, well-known" but also "necessary evil" could also be found in the narratives of the interviewees. Identities and coal infrastructure seem to be tightly interwoven in the region and therefore difficult to separate. An exception are the coal mines which are often hidden behind dense green corridors, away from public view (cf. Miller, Iles, and Jones 2013) and difficult to access. All interviewees describe them ambivalently as barren and destructive (all), but also

as impressive (Schmidtke, Kohl, Winkler) and as a testimony to outstanding technological skills (Schmidtke, Kohl). This tentative identification with the "holes" changes as they are flooded, and all interviewees saw this process as something beneficial that emerged from coal mining, which facilitates identification with the landscape after mining. All interviewees invited me to go for a walk with them at the (emerging) lakes for the narrative interviews. For all of them, the lakes have a positive connotation for the future of the region. Following Wheeler, flooded mines can thus be read as sites of 'productive nostalgia' that allow the maintenance of identities over time (Wheeler 2017).

The energy landscapes of Lusatia are described by Kobjela, Kohl and Winkler as a periphery with little connection to effective mobility infrastructure. Hornburg et al. (2016) describe the "spatial separation of extraction, production and consumption" in modern and industrialised societies as the reason why coal and the associated work, infrastructure and landscape disappeared from social view. Due to the focus on the energy transition, the gaze is now directed back to coal-fired power generation, but the identities shaped by landscape and labour are not in focus. In this regard, it is interesting how Winkler describes the external perception of Lusatian mindsets and landscapes. The people of the region are labelled with a "brown" identity determined by coal and right-wing mentalities, and thus landscape and identity are also directly associated with each other from outsiders' perspectives.

The categories of energy epistemics and landscapes could provide a strong framework to reveal the relations between cultural and material parts of identity formations of coal workers in Lusatia. Furthermore, the findings reflect those of Kirk et al. (2012), Thorleifsson (2016) and Wheeler (2014), who investigated the identity-forming elements of coal mining in affected regions after the British coal industry was shut down. It remains to be asked how people can preserve these emotional connections to changing landscapes and knowledge over time in order to preserve stories of living and working (Stewart, Liebert, and Larkin 2004).

6.2. Considering coal workers' identities in phase-out processes

With the third theoretical lens of energy justice, I addressed the "serious and conflict-laden normative and ethical issues" (Miller, Iles, and Jones 2013, 174) that affect the identities of Lusatian lignite workers through energy production and consumption. In the following, I will first examine how identities shaped by work in lignite mining and combustion can be considered in a respectful way during the transition by outlining proposals (table 2). These were developed directly from the lignite workers' justice claims and are presented as embedded within the three pillars of energy justice. Subsequently, I will discuss them.

Table 2: Overview of energy justice proposals

Energy justice	Proposals	Interviewee(s)
Distribution	Create ('green') employment opportunities for the most vulnerable and open space for new positive identities	Kobjela, Kohl
	Maintain and expand spatial living standards linked to existing infrastructure	Kobjela, Kohl, Winkler
	Efficient and fast mobility connections to non-lignite infrastructures	Kobjela, Kohl, Winkler
	No siting of other 'dirty' technologies such as sewage sludge incineration	Kobjela
	Embed the coal phase-out in the overall economical procedures, act consistently and comprehensibly with regard to the environment and climate protection at the local, national and international levels	Winkler, Kohl
	Comprehensive reappraisal of land-use conflicts and dispossessions dating back to the GDR	Kobjela, Kohl
	Maintain secure and affordable energy supply	Schmidtke, Winkler
Recognition	Foster a respectful representation by media and political advocacy	Kobjela, Schmidtke, Winkler
	Combat shift to the right	Kobjela, Winkler
	Promote a culture of exchange of different opinions	Kobjela, Winkler
	Dismantle hierarchical structures within the company and create opportunities for participation and co-design of the transformation processes	Kobjela, Winkler
	Create new incentives and opportunities for diverse lifestyles and migration to Lusatia	Kobjela, Kohl
	Reduce preconceptions about people and the Lusatian landscape	Winkler, Kohl
Procedures	Clear and reliable roadmap for coal phase-out (considering CO_2 pricing) with participation of all stakeholders with focus on workers' rights	all

	Monitor the entire phase-out process with focus on worker's rights, to identify emerging needs rapidly and effectively.	all
	Trade unions with broad interest representation bodies fostering the expression of different demands	Kobjela, Schmidtke
	Develop contingency plans that are enforced when redundancies and economic devaluation processes occur more quickly than planned	all
	Focus on securing livelihoods and creating new employment opportunities for workers	all
	Consider resource effective and climate smart solutions for phasing-out mines and power-plants	Kobjela

The proposals listed above can be helpful in facilitating the transformation of workers' identities towards a Lusatia that is no longer dependent on fossil extraction and burning. They are directed towards a broad audience consisting out of workers, policy makers, residents, community councils, climate-justice activists and all other groups and individuals interested in a just transition process of Lusatia's lignite phase-out.

Foremost, it seems to be important to create new possibilities of identification such as work, social fabric, landscape, and infrastructure that embed people in a socio-material context. The coal identity that defines Lusatia can be constructed as "productive nostalgia" (Wheeler 2017) from which new spacious – in both senses – identities can be developed. Quarry ponds as a material basis could play a major role in this. External perception of both people and landscape also plays a role in respectful transition. At the regional level, it seems most important to create opportunities for discourse in which ideas, visions of the future and fears can be discussed effectively, non-polemically, and on equal footing. Politicians, especially those at the federal level, must show genuine interest in regional identities in order to reduce attitudes of resignation and disenchantment with politics, and to inspire people to participate in the transition. The most important thing for the interviewees was to be able to follow a reliable exit plan that regulates when people lose their jobs and outlines what kind of fall-back options are available so that people have planning security. The given proposals are based on the justice claims of only four coal workers interviewed. Nevertheless, many of the patterns identified and the resulting justice claims are congruent with the results of a study by Bose et al. (2019) on the views of LEAG employees regarding the lignite phase-out. The energy justice framework provided a good starting point for the study of energy justice in its social dimensions, and revealed the interconnectedness of access to energy, the equitable distribution of costs and benefits, and the opportunities for participation in the transformation of energy systems (Miller, Iles, and Jones 2013). It was notable that the focus of the

interviewees was mainly on the production, rather than consumption, of energy. This finding can be attributed to the research design and the position of the workers as producers.

7. Conclusion: Energy identities for futures?

Through the narratives of the four interviewees, I was enabled to present a complex picture of identity-creating epistemics, landscape perceptions and justice claims arising from work in the coal sector. I depicted synergies between the knowledge that the interviewees drew from their work and education, and their perceptions of the landscapes, which I ultimately discovered as influencing who they are, how they want to live and who they want to become. As energy epistemics and energy landscapes undergo a process of change with the coal-phase out, identities must also transform to keep up with the new demands and opportunities of the region. Three of the four interviewees agree with the planned phase-out; two even support it. The interviewees call for justice in the process, and for politics and society to recognise the identities associated with the lignite sector. Flooded coal mines can already serve as an excellent example of how past and future can be connected to one another in their socio-material consequences, and the lakes can thus serve as a projection site for positive nostalgia and new identity imaginaries.

From a global perspective, and especially given the immensely unequal distribution of costs and benefits from the extraction and burning of fossil fuels between the global South and North, it may appear cynical to focus on the justice claims of Lusatian coal workers. I have argued in this paper that for a socio-ecological transformation to succeed rapidly, it is essential to take all people into account, and especially focus on workers' rights in the context of a just transition. The example of coal workers' identity formation in relation to their work can thus show an interconnectedness between work and identity that is important to consider in order to provide social, ecological and economic well-being for people in the region and can help to reduce resistance to the transition processes. In addition, justice claims could be developed in relation to the identities and presented as proposals. Currently, 'only' 8000 jobs at LEAG are directly affected by the coal phase-out in Lusatia, and the unemployment rate generated by the transition is dampened by the effects of demographic change (Oei, Kendziorski, et al. 2020). However, I conclude that the role of coal has a social position beyond jobs and thus influences the whole transformation process of Lusatia. Furthermore, the results presented in this paper serve as hints for transformation processes in other regions and other sectors.

With this conclusion, this thesis proposes examining and extending the findings presented. Further research should therefore explore how exactly the recognition of these identities can be reflected in procedures and policies in an equitable and respectful way, and how workers themselves can participate in these processes. What can be new identification potentials for Lusatia, and for coal workers in

particular? How can the political participation processes shaping new identities in the region be made more inviting and accessible to workers? Also, linking back to my involvement with Ende Gelände, climate justice activists ought to continue to think about how to align workers' struggles with climate justice fights and what (new) forms of organisation are needed for this – because valuing workers' identities in low-carbon transition processes can be the key to accelerate just and respectful phase-outs.

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Appendices

Appendix I: Interview guideline 1st interview cycle: semi-structured interviews

*translated from German into English

PAST

1) What is your first memory of open-cast mines and lignite infrastructures in the region?
2) What kind of environment do you think of when you think about your childhood?
   a) Where did you play?
3) Could you tell me how you came to work in the lignite sector?
4) What did you do after finishing school? What did your friends do?
5) What was your education like? Where did it take place?
6) Could you describe how a normal working day used to be for you?
   a) Did you have certain routines?
7) How was social life organised in the past in the open-cast mine / in the power-plant / at your workplace?
   a) Did you have contact with your colleagues beyond work?
   b) Did you also discuss private topics with them?
   c) Apart from that, what role did the lignite infrastructures play in your social relationships?
8) How did your relatives relate to opencast mining?
   a) Are there any often-told family stories that took place in opencast mining or within the coal sector?
9) Do you remember previous trips with the family in the region, where did you go? What kind of landscapes did you visit?
10) How was opencast mining, coal-fired power generation, the opencast mining industry and Lusatia perceived and reported on in public?
    a) What was the image of the region in the past?
11) Could you tell me a story from the opencast mining era that you particularly like to think back to?
12) Is there also a story that makes you sad or angry?

first artefact – with significance for work within the lignite sector in Lusatia

- Can you describe the story behind your first artefact?
- What does it symbolise for you?

PRESENT

13) Do you miss anything from the past?
14) How does a typical working day look for you nowadays?
    a) Can you describe where you work now and what exactly you are responsible for?
15) What kind of relationship do you have with your job right now?
    a) What do you like most about your job? What don't you like?
16) Can you describe the feeling you get when you see an open-cast mine?
17) Where do you go to in the region when you have a day off and need recreation?
    a) Why?

b) Where do you go for a walk and why?
18) What role do opencast mines, power-plants or your job play in the community in which you live?
19) Has your social context changed a lot compared to the past?
20) How do you talk about the coal phase-out with friends, acquaintances or family?
   a) What bothers you most talking about the coal phase-out with friends, family or acquaintances?
21) When was the last time you heard about the coal phase-out on the news and what was the content?
22) What role do trade unions play for you for the coal phase-out?

second artefact – with significance to experiences of the planned coal phase-out

- Can you describe the story of your second artefact?
- What does it symbolise for you?

FUTURE

23) How do you forecast the future in relation to your job?
24) How do you forecast the future of the region?
25) Do you have children? What do you wish for their futures?
26) What are the prospects for future generations in the region?
27) Could you tell me what you wish for Lusatia?
   a) What does Lusatia look like for you in the future?
   b) Is there something what scares you when you think about the future?
   c) What are you looking forward to?
28) What is the most important thing that should be guaranteed in terms of the future?

→ Is there anything else you would like to add or address?

Appendix II: Example of postscript
Postscript 1

(cf. Kruse, 2015)   semi-structured online interview   19.05.2021

Interviewee:	Rainer Schmidtke
Conversation atmosphere:	The interview was conducted via Zoom. The interviewee came to the interview well prepared and had already sent pictures of the artefacts as an email prior to the interview. Right in the beginning of the interview the interviewee suggested to be on a first name basis with each other. The interviewer accepted. The interviewer took time for the interview and answered extensively to the interviewer's questions. The interview atmosphere was good and relaxed.
Sensitivities:	There were no sensitivities addressed by the interviewee
Rapport (= relationship between the communicants)	The interviewer and the respondent did not know each other before. The atmosphere was relaxed and different opinions could be discussed openly.
Course of conversation (i.e. developmental dynamics)	The respondent answers openly to questions posed. In between, he digresses and the interviews thread has to be picked up again and references to what was said before had to be made.
Interactions (i.e. special interaction phenomena between communicants)	In between, discussions arose in which the interviewer partly stepped out of her professional role. Topics of the discussions were man-made climate change and gender-sensitive language. However, any tensions that arose were resolved again.
Specifics:	The interviewee said that he likes to explain and explained a lot to the interviewer.
Striking themes:	Fascination with coal mining technology and appreciation of industry aesthetics, mines are simultaneously scary places and fascinating, devaluation of wind and solar energy, negation of anthropogenic climate change: "climate has always been changing", disenchantment with union representation, proud miner, traditions, emphasising faith in science and technical solutions but questioning the work of the Potsdam Institute for Climate Impact Research, media criticism and criticism of the Greens
Disturbances (e.g. of the interview process)	In between, the interviewee's family came in and was introduced to the interviewer. The mobile phone battery ran out and had to be recharged during the interview.

LUND UNIVERSITY

Participants Consent Form

Einverständnis über Teilnahme an Forschung

Title of research study: Phasing out identities - Narratives of Coal workers´ struggles in Lusatia's energy transition process
Titel der Arbeit: Ablaufende Identitäten – Narrative der Gerechtigkeitsansprüche von Kohlearbeitern in der Lausitzer Energiewende

Researcher / Forscherin: Nele Buchholz

The researcher has informed me about the following:

Die Forscherin hat mich über Folgendes informiert:

1. The purpose of the study
   Den Grund der Forschung

2. I can withdraw from the study. If so, I don't have to give a reason for that.
   Ich kann jederzeit meine Mitarbeit beenden, ohne Gründe dafür angeben zu müssen.

3. The recording of the interview. These data will be deleted after use for this particular thesis.
   Die audio-visuelle Aufnahme der Interviews. Diese Daten werden ausschließlich für die oben genannte Arbeit genutzt und anschließend gelöscht.

4. All information the researcher gets from me is kept confidential. My name is anonymized.
   Alle Informationen, welche die Forscherin von mir bekommt werden vertraulich behandelt. Mein Name wird anonymisiert.

_____

Date and signature / Datum und Unterschrift

_____

Name in block letters / Name in Druckschrift