POLITICS OF INDUSTRIAL AIR POLLUTION IN CZECH LANDS AND EAST GERMANY IN THE 1980S AND 1990S

By

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AUTHOR'S DECLARATION

I, the undersigned, Matěj Moravanský, candidate for the MA degree in the Master of Arts in Comparative History declare herewith that the present thesis is exclusively my own work, based on my research and only such external information as properly credited in notes and bibliography. I declare that no unidentified and illegitimate use was made of the work of others, and no part of the thesis infringes on any person's or institution's copyright. I also declare that no part of the thesis has been submitted in this form to any other institution of higher education for an academic degree.

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ABSTRACT

In my thesis, I analyse the politics of industrial air pollution in the Czech Lands and East Germany during the late 20th century. In the 1980s, Central Europe faced a significant ecological crisis. The extensive economic use of fossil fuels caused the pollution of soil, water resources, and air, negatively affecting human health, as well as the health of animals, plants, trees, and natural and social ecosystems. The Czechoslovak Socialist Republic and the German Democratic Republic were situated in the heart of the polluted area, and most of the toxic emissions originated from their industries and energy sectors, resulting in significant damage. In response to these existential threats, the governments of both countries implemented various ecological policies to address the crisis, both during the state socialist period and the subsequent post-socialist era. While some policies emerged before 1989 and were continuous in the post-1989 period, others were newly introduced by the democratic capitalist regimes. By the late 1990s, the situation began to improve. By examining the responses of the state socialist and post-1989 regimes in both countries to the crisis, I aim to provide insight into the structural nature of the socioeconomic systems of that time. I focus on understanding the continuities and discontinuities in these responses and policies. Studying these struggles will provide insight into the underlying causes of many contemporary challenges related to climate and biodiversity loss crises.

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I have prepared the thesis independently according to the prevailing conception of scientific work. Still, according to my conviction, my work is the fruit of a network of knowledge (my almae matres, Central European University, and Charles University, Faculty of Arts), care, and reproductive labour (my family, friends, and close ones), inspirations (readings, music, nature, conversations), but also many specific people and non-human, natural actors, or other factors (for instance my privilege of white, male European). Therefore, completing this thesis was only possible with parts of this network. While I could not traditionally cite them, I do not see any contradiction between this acknowledgment and standard academic practices. From my perspective, this thesis does not solely represent my efforts but rather the culmination of efforts on a wider web of relationships for which I feel a sense of responsibility. I am aware of my dependence on this network, and I hope that the knowledge embraced in this work will contribute to the network's ongoing vitality and fruitfulness in a future that remains uncertain.

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INTRODUCTION

Throughout the 1980s and 1990s, large parts of Central Europe experienced a severe ecological crisis. The main environmental issues included water, soil, and air pollution, degradation of ecosystems, and depletion of raw materials and landscapes. These combined problems led to a breakdown in the region's relationship between nature, non-human agents, and socioeconomic systems. The issues included water contamination from chemical products, unsustainable land use, excessive soil improvement leading to water loss and loss of biodiversity, and extensive and demanding nature management projects such as the construction of water dams on the Vltava River, the Gabčíkovo–Nagymaros Dams on the Danube, and the growth of monoculture forests, which resulted in numerous unprecedented disasters.[1]

In this thesis, I aim to analyse one of the many symptoms of the potential collapse: industrial air pollution. Central Europe is a region abundant in coal, particularly in the triangular area comprising Germany, the Czech Republic, and Poland. Massive underground deposits of black coal, brown coal, and lignite contain enormous amounts of solar energy, which are remains of ancient plants and organisms transformed by biological and geological processes into what we call coal. People in this coal-rich region have relied on coal for cooking, heating, and powering industrial machinery for centuries, driving economic growth and supporting wartime efforts. After World War II, coal had to serve the new socialist regimes. The large-scale projects on industrialization and electrification of Central Europe were powered by burning coal, but this energy production has a severe consequence: air pollution.

The state socialist regimes of Central Europe knew very well about the situation and developed many policies to mitigate the negative impacts of burning coal. However, the

[1] See Matěj Spurný, *Making the Most of Tomorrow: a Laboratory of Socialist Modernity in Czechoslovakia* (Prague: Karolinum Press, 2019), or Tobias Huff, *Natur und Industrie im Sozialismus: Eine Umweltgeschichte der DDR* (Vandenhoeck & Ruprecht, 2015).

continuous degradation of ecosystems and worsening environment increased the deteriorating health of the population. In East Germany, Czechoslovakia, and Poland too, the protest against horrific ecological conditions and so-called environmental movements played a vital role in the process of delegitimization of state socialist regimes.[2] After the implosion of state socialism, the introducing of various "green policies" was one of the main legitimization instruments of new democratic governments.[3] And it had results; by the policies, politics successfully achieved reducing of pollution in large areas by placing emission limits on toxic substances, mainly sulphurous and nitrogen compounds, and by installing pollutant separators. However, large parts of environmentally harmful industries were shut down by the economic shock of the 1990s following the transformation of regional economies, and the effect of policies could not be overestimated. The success in reducing pollution was thus a combination of many factors: policies continuous from pre-1989, ambitious new democratic governments and also restructuralization of the economy and collapse of previous economic model. In the last years of the 1990s, the problem seemed to be solved. Nonetheless, the ecological crisis caused by using fossil fuels has not disappeared but has come back with broader, truly global consequences in the ongoing climate crisis.

The ecological crisis related to air pollution has now developed into a climate and biological diversity loss crisis. According to environmental scientist Izak Stoddart and his co-

[2] For the Czechoslovak case see Michal Kopeček, et al., *Architekti dlouhé změny: expertní kořeny postsocialismu v Československu* [*Architects of Long Change: the expert roots of postsocialism in Czechoslovakia*] (Prague: Argo, 2019), and Petr Jehlička and Joe Smith, "Trampové, přírodovědci a brontosauři: Předlistopadová zkušenost českého environmentálního hnutí jako předzvěst ekologické modernizace," ["Tramps, environmentalist and brontosaurs: The Pre-November Experience of the Czech Environmental Movement as a Precursor to Ecological Modernization"] *Soudobé dějiny*, 24, no. 1-2 (2017), 78-101, Polish case see Julia Szulecka and Kacper Szulecki, "Between domestic politics and ecological crises: (De)legitimization of Polish environmentalism," *Environmental politics*, 31, no. 7 (2022): 1214-1243, and finally for East Germany see Christian Halbrock, "Die Unabhängigen Umweltgruppen in der DDR. 'Zwischenstand' nach zwei Jahrzehnten Aufarbeitung," *Zeitschrift für Evangelische Ethik*, 54, 3. (Gütersloher Verlagshaus, 2013) and Christian Möller, *Umwelt und Herrschaft in der DDR: Politik, Protest und die Grenzen der Partizipation in der Diktatur* (Göttingen: Vandenhoeck & Ruprecht, 2019).

[3] See Matěj Spurný, "Mezi vědou a politikou. Ekologie za socialismu a kapitalismu (1975-1995)," ["Between science and politics. Ecology under Socialism and Capitalism (1975-1995)"] in *Architekti dlouhé změny: expertní kořeny postsocialismu v Československu*, edited by Kopeček, et al., 267-313.

authors, over half of the cumulative carbon dioxide emissions, one of the primary greenhouse gases responsible for significant changes in the Earth's climate system were produced after 1990.[4] Although Central Europe has experienced a substantial decline in emissions, it is still one of the most carbon-intensive regions in Europe, and as such, it plays a significant role in pushing the Earth's systems beyond the safe operating space for humanity.[5] State socialist regimes relied on economic growth based on massive fossil fuel use, which caused air pollution. This contributed to factors that led to the delegitimization of their political order and the eventual collapse of state socialist regimes in the GDR and Czechoslovakia. However, the source of problems persists – democratic capitalist regimes of today are working to tackle issues regarding climate change, which is also co-caused by the extensive burning of fossil fuels.

The main theme of my thesis is the conflict between the desire for expanding economic performance through coal burning and the significant adverse effects of its extensive use as a fossil fuel. In my analysis, I will focus on the politics regarding industrial air pollution in the GDR and Czechoslovakia in the 1980s and then trace it across the fall of state-socialist regimes in 1989 and finally take a look at links of the stories under the conditions of new post-socialist regimes in the unified Federal Republic of Germany and the Czech Republic in 1990s. The primary object of focus is the concept of political ecology, as defined by Ulrich Brand and Marcus Wissen, which explores the power relations and hierarchies between ecosystems and social, economic, and political systems. According to Brand and Wissen, ecology is not just about protecting species, but ecology aims to describe the networks and structures created by living beings and their ecosystems.[6] The term "political" highlights the fact that the

[4] Isak Stoddard, et al., "Three Decades of Climate Mitigation: Why Haven't We Bent the Global Emissions Curve?" *Annual review of environment and resources*, 46, no. 1 (2021), 653-689.

[5] Katherine Richardson, Will Steffen, Wolfgang Lucht, Jørgen Bendtsen, Sarah E. Cornell, Jonathan F. Donges, Markus Drüke, et al., "Earth beyond six of nine planetary boundaries," *Science advances*, 9, 37 (2023).

[6] Ulrich Brand, and Markus Wissen, *The Limits to Capitalist Nature: Theorizing and Overcoming the Imperial Mode of Living* (London: Rowman & Littlefield, 2018), 47.

arrangement of such structures depends on hierarchies of power and negotiations among a wide range of actors. The main research question posed in this thesis is: How can the political ecology of these regimes be characterized?

In this thesis, I claim that there are significant continuities between the ecological policies implemented in new, neoliberal capitalist democracies and the efforts made by state socialist regimes before 1989 to address ecological crises. The common thread lies in the reliance on technocratic solutions, such as the construction of large nuclear power plants or the introduction of technologies to clean the process of burning coal – or, in other words, green modernization. These policies aimed to protect socio-economic systems, which were based on (in state socialism as well as in democratic capitalism) accelerating production and consumption while utilizing ecosystem resources to fuel the economy for as long as possible. However, the high pace of production and consumption resulted in severe ecological problems and led to many ecosystem collapses. This situation, in my view, can be called a civilizational dilemma: by using exploitative practices such as mining and introducing technological modernization, pre- and post-1989 aimed to secure raising of living standards, but this resulted in the crises, which threatened to radically decrease the quality of life of populations in both countries.

As I describe, pre- and post-1989 regimes are connected by continuities in the policies and socio-economic models that caused ecological crises. I think it is necessary to uncover them to understand current challenges related to global climate and biodiversity loss crises and avoid repeating dead-end paths.

Literature Review

Scholarship on the environmental history of Central Europe in the second half of the 20th century has focused mainly on two issues: large construction projects and the histories of

ecological protests and movements. These two research areas are well-surveyed and provide a basic factual overview of ecological polities, especially before 1989.

After World War II, socialist states in central Europe implemented ambitious plans to transform their economies. This involved rapid industrialization and investment in large construction projects, which came at the cost of massive changes in landscapes, forestry, river flows, and urban spaces. In their book titled *The Cult of Unity: Stalin's Plan to Reshape Nature in Czechoslovakia 1948-1964*, Jiří Janáč and Doubravka Olšáková examine the plans of the Czechoslovak communist government.[7] The policies included in the plan aimed to reclaim wetlands and narrow rivers and consolidate smaller meadows previously used by farmers into large fields for the agricultural industry. In addition to agricultural projects, several large dams were constructed on Czechoslovak rivers during this period, same as coal power plants, electrification, and building up utility networks throughout the country. The exact process connected with the post-war reconstruction can be seen in the GDR. Historian Tobias Huff describes the ambitions of the new state socialist regime for post-war reconstruction via intensive forestry, agriculture policies, and exploitation of coal in the Sachsen and Helmstedt region.[8]

The negative impacts of accelerated industrialization in regions of North Bohemia and Saxony powered by burning fossil fuels, as well as large construction projects around the GDR and Czechoslovakia, resulted in the emergence of a diverse variety of environmental movements. German environmental movements centralized around the Protestant Church in various local parishes and independent groups that published samizdat magazines and organized protests, as historians such as Christian Halbrock or Astrid Kirschhof describe.[9] The

[7] Jiří Janáč, and Doubravka Olšáková, *The Cult of Unity: The Stalin Plan for the Transformation of Nature in Czechoslovakia 1948-1964* (Prague: Academia, 2021).

[8] See Huff, *Natur und Industrie im Sozialismus: eine Umweltgeschichte der DDR*.

[9] See Christian Halbrock, "Die unabhängigen Umweltgruppen der DDR," *Zeitschrift für evangelische Ethik* 54 (3), 2010, and Astrid Mignon Kirchhof, "For a Decent Quality of Life: Environmental Groups in East and West Berlin," *Journal of urban history* 41, no. 4 (2015): 625-646.

consequences of the industrial boom and exploitative attitude to the natural environment had severe consequences for the legitimization of the Czechoslovak state socialist regime, argues Miroslav Vaněk in the book *It was Impossible to Breathe Here: Ecology in the Czech Lands Between 1968 and 1989*, much as Matěj Spurný claims in the article "Between science and politics: Ecology under socialism and capitalism (1975-1995)" which tries to describe main trends around ecological problems in Czechoslovakia during 1980s.[10]

Spurný represents a broader trend in the recent Czech historiography to trace the continuities of the environmental movement and expert knowledge across the milestones from 1989 to the 1990s. Petr Jehlička and Joe Smith had the same ambition and tried to connect Czechoslovak environmentalism before 1989 with the concept of ecological modernization.[11] They claimed, that environmentalist grass-roots activities within Czechoslovakia same as some of the environmental experts who collaborated with the movement were the basis for post-1989 environmental policies. However, Historian Kristina Andělová shows, the dissident movement cannot be connected directly with environmentalism. She examines the political thought behind environmentalism within the Czechoslovak dissident milieu, which resulted in groups around Charter 77 not being considered mainly environmentalists, but more or less as a wide protest movement whose members were deeply concerned about the country's ecological problems, but it was not the constitutive element.[12] The environmental history of the GDR and Czechoslovakia in the 1980s has been extensively researched. However, most research has focused primarily on environmental movements and groups and their role in undermining the state socialist regimes in both countries. In the broader context of environmental issues in the

[10] Miroslav Vaněk, Nedalo se tady dýchat: ekologie v českých zemích v letech 1968 až 1989 [It was impossible to breathe here: ecology in the Czech lands between 1968 and 1989] (Praha: Maxdorf, 1996), and Spurný, "Mezi vědou a politikou. Ekologie za socialismu a kapitalismu (1975-1995)".

[11] Jehlička and Smith, "Trampové, přírodovědci a brontosauři. Předlistopadová zkušenost českého environmentálního hnutí jako předzvěst ekologické modernizace."

[12] Kristina Andělová, "Existoval chartistický environmentalismus? Charta 77 a reflexe životního prostředí" ["Did Chartist Environmentalism Exist? Charter 77 and Environmental Reflection"], *Soudobé dějiny* 30, no. 2, (2023): 351-384.

state socialist camp, Hungarian historian Victor Pál published a comprehensive book on technology and the environment in the case of state socialist Hungary.[13] Pál also focuses on waste management and energetic policies and technocratic management regarding ecological problems.[14] In the 2022 volume, the journal *Contradictions* brought several studies on environmentalism or ecosocialists degrowth thinking in former Soviet Bloc, among them also article on polish "limits to growth" debates in 1970s by Weronika Parfianowicz.[15] In the recent past, environmental historians have prepared a lot of exciting scholarship; however, less attention has been given to the ecological policies and strategies of state structures during the 1980s.

Regarding the 1990s context, a simplistic transitional perspective has long prevailed in the effort to historicize the 1990s, but as recent scholarship shows, this is no longer sustainable. For instance, on the history of economic transformation in Czechoslovakia, historian Václav Rameš shows, that neoliberal reforms and policies which led to the establishment of a free-market economy and privatization – one of the biggest ownership transfers in the history of the country – were not simply copied from the West, but had significant domestic element. In the case of Czechoslovakia in strong national aspect was behind such policies.[16] The German case was recently examined for instance by Till Hilmar which focuses on sentiments, emotions, and memories of the transformational period in post-socialist countries, among them the GDR too, and by examine transformational reality in the new federal states of Germany.[17] Besides such

[13] Viktor Pál, *Technology and the Environment in State-Socialist Hungary: An Economic History* (Cham: Springer International Publishing, 2017).

Viktor Pál, "Trouble with the Bottle Beverage Containers and the Widening Waste Crisis in Socialist Hungary," *Journal of contemporary history 59*, no. 2 (2024): 293-312.

[15] Weronika Parfianowicz, "Limits to Socialist Growth: The Question of Economic Growth and Environmental Crisis in Polish Discussions of the 1970s," *Contradictions 6*, no. 2 (2022): 41-66.

[16] Václav Rameš, *Trh bez přívlastků, nebo ekonomickou demokracii? Spory o podobu vlastnické transformace v porevolučním Československu* [*Market without Adjectives or Economic Democracy? Disputes over the Form of Ownership Transformation in post-revolutionary Czechoslovakia*] (Prague: Ústav pro soudobé dějiny AV ČR, 2021).

[17] Till Hilmar, *Deserved: economic memories after the fall of the Iron Curtain* (New York: Columbia University Press, 2023).

works focus on economic transformation, historian Stephen G. Gross published the monography *Energy and Power: Germany in the Age of Oil, Atoms, and Climate Change*.[18] Gross primarily examines the West German context and, moreover, partially discusses the energetic aspect of reunification after the Peace Revolution in the GDR during the 1990s. Despite Gross's comprehensive analysis of political and economic developments, a lack of perspective on environmental history in both the 1980s and 1990s goes beyond describing protest movements or economic transformations. I think delivering the perspective of environmental history is necessary to take a more comprehensive approach and synthesize the knowledge gained from political and economic perspectives into a larger narrative about the energy, the environment, and the overall history of East Germany and the Czech Lands during the 1980s and 1990s. My thesis attempts to do so and synthesize the "political ecology" of state socialist regimes and their successors in the 1990s.

In addition to this political ecology perspective, I want to offer another contribution to the existing scholarship. In the historical debates on the 1980s and 1990s, almost all the works still needed to be included, which considers pre-1989 and post-1989 as a single period. For instance, Michal Kopeček and his colleagues in the book *Architekti dlouhé změny: expertní kořeny postsocialist v Československu* (*Architects of Long Change: the expert roots of post-socialism in Czechoslovakia*), describe continuities of the Czechoslovak managers, economic elites, technocratic governance, and political thinking, and by that offer fruitful analysis which goes beyond classic narratives of the tranzitology.[19]

[18] Stephen G. Gross, *Energy and power: Germany in the age of oil, atoms, and climate change* (New York: Oxford University Press, 2023).

[19] Kopeček, et al., *Architekti dlouhé změny: expertní kořeny postsocialismu v Československu*.

Theoretical Framework

I use the political ecology framework to provide such an environmental history perspective. Political ecology aims to bridge the gap between two fields of study: political, social, and economic relations, examined by social scientists on the one hand, and relationships between various organisms and their environments, which explores natural sciences on the other hand. The central objective of the political ecology approach is to overcome this division, especially the separation between social and natural aspects.[20] Ecology, in this framework, is not simply about nature protection or conservation but rather an effort to describe and analyse the interrelations, material and energetic flows, agency, and interactions between human and nonhuman actors, social and economic systems, and ecosystems, as Bruno Latour does in his works.[21] Constructing my perspective is the important claim of Ulrich Brand and Marcus Wissen, who repeatedly write that political ecology focuses on "social power relations and struggles within and the political economy of the socio-ecological crisis and its management."[22] In other words, within the framework of political ecology, "society and nature are not understood as isolated units but in the broader context of 'society–nature relations.'"[23] Political ecology is then an intellectual project that wants to go beyond distinguishing historical actors alongside traditional and strict dualistic division between "nature" and "society." Thus, political ecology does not ask about the way of organizing society, which has an impact on nature, but it is more about organizing nature and society together. I claim that the political

[20] See Gustav Cederlöf, *Discovering political ecology* (Abingdon, England: Routledge, 2024) or Paul Robbins, *Political ecology: a critical introduction* (Chichester: Wiley-Blackwell, 2012).

[21] See Bruno Latour, *Down to Earth: Politics in the New Climatic Regime* (England: Polity Press, 2018), or Burno Latour, *Facing Gaia: Eight Lectures on the New Climatic Regime* (Cambridge, United Kingdom: Polity Press, 2017).

[22] Brand and Wissen, *The Limits to Capitalist Nature: Theorizing and Overcoming the Imperial Mode of Living*, 47.

[23] Ulrich Brand, and Markus Wissen, *The Imperial Mode of Living: Everyday Life and the Ecological Crisis of Capitalism* (London, New York: Verso, 2021), 77.

ecology perspective can be useful in historicising and uncovering the dynamics of the recent history of ecological crises.

One of the main principles of the political ecology approach is also understanding ecology not as an endeavour for the protection of some natural species or ecosystems but more as an endeavour to describe relationships and exchange of energy, materials, or knowledge between organisms, humans, and non-human actors, and their environment. In the words of environmental historian Jason W. Moore, ecology focuses on a *web of life*.[24] Moore's concept illustrates how political, economic, and ecological interactions among historical actors are interconnected within a web that includes infrastructures, energy sources, or waste and energy absorption capacities. Specifically, coal mining involves more than just extracting raw materials; it also profoundly affects the natural and social dynamics within the mining area. Furthermore, it affects the climate system of the entire planet. Therefore, throughout the thesis, I move across the scales, and I try to analyse activities and policies that took place on the regional and relatively small level of two regions in the south of East Germany and North of Bohemia and connect them with the global level of ecological crises. In this thesis, I almost completely do not note the Slovak case, and instead of focusing on the whole territory of the former federation, I elaborate mainly on the issue of industrial air pollution, which was present in Slovakia but in a smaller size than in North of Bohemia.

To deliver an analysis of the regional issues and connect it with the broader, even global, consequences it had, I use the concepts of Jason W. Moore, who developed them mainly for the analysis of capitalism. However, I claim that they can be used to examine state socialism as well. Moore defines *capitalism in nature* as an attitude toward natural ecosystems and their services and sources as "free gifts" that can be taken without awareness of consequences and

[24] See Jason W. Moore, *Capitalism in the web of life: ecology and the accumulation of capital* (London: Verso, 2015).

to fuel the process of endless capitalist accumulation. Thus, these natural resources belong to the actors (or, in the words of Moore, capitalists) who can fund their seizing and practice the appropriation of productive parts of the *web of life*. State socialism did not aim to sustain the accumulation process as capitalism does, but as I argue, state socialist regimes in GDR and Czechoslovakia wanted to sustain growth in production and consumption, satisfy old, and create new material needs in the population. The result of *state socialism in nature* was comparable to capitalism in nature: degradation of ecosystems, revolutionizing and destabilizing the *web of life*, and causing the global ecosystem and climate crisis. By incorporating Moore's concepts, I can analyse the dynamics among historical actors, understand power dynamics, and observe who holds power over natural and human actors under the conditions of democratic capitalism as well as state socialism. Additionally, it helps me contextualize the political ecologies of state socialist and post-socialist regimes with the broader tendencies of the late 20th century.

Besides the concepts I used to analyse the social-nature relations in the GDR, the new federal states of Germany, and the Czech Lands during the 1980s and 1990s, I also need to explain why I consider the pre-1989 regimes as *state socialists* and the post-1989 regimes as *democratic capitalists*. A large and still ongoing debate has happened around the question of which name to use for political governance, as well as the social and economic model of that time.[25] Alongside historians Thomas Lindenberger and Matěj Spurný, I opt for state socialism as a term that marked the period between the late 1950s and the implosion of regimes in both countries in 1989. Regimes of the GDR and Czechoslovakia shared a relatively similar level of industrialization, socialist ownership with a state-planned economy, central governments with strong parallel structures of ruling parties, the SED (Sozialistische Einheitspartei

[25] For the broader overwiev of the debate: Michal Pullmann, "Social History and the Totalitarian-History Narrative," *Soudobé dějiny/CJCH* 15, 3-4 (2008), 703-717.

Deutschlands – Socialist Unity Party of Germany), and the KSČ (Komunistická strana Československa – Czechoslovak Communist Party), and belonging to the Soviet Block. Thus, the adjective "state" emphasizes the key role of the state structures dominated by the communist parties in social, economic, and political life. By the term *democratic capitalism*, I mark regimes that were established in former the socialist Czechoslovakia and the GDR after 1989. In the case of the Czechoslovakia, I indicate a relatively short period of transformation after the few years from the revolution when state institutions were reclaimed by democratic institutions such as free elections. After this period, nationalist neoliberals under the Václav Klaus leadership launched pro-market reform and privatization with the aim of connecting the country's economy with the capitalist world.[26] However, they also wanted to create national capital, so the Czechoslovak neoliberal reform cannot be considered as a clear example of classic Western neoliberal policies. With the division of the federation and foundation of the Slovak Republic and the Czech Republic, new democratic institutions were established in the new constitutions such as. Thus, the regime that was built up in the first few years can be called democratic capitalist: democratic institutions represent political life and coexist with the free-market economy and activities of private capital. The GDR was a bit different story. After the implosion of state socialism, the government of Hans Modrow brought the GDR to free elections in 1990, and reunification took place after negotiations with the German Federal Republic. However, from a practical level, it was more creation and then accession of "new" federal states (former GDR) rather than simply reunification of two existing state entities. The former GDR had to adopt the legislative system, economic mechanisms, and political institutions developed in post-war West Germany. Nevertheless, the model of governance and

[26] See Martin Myant, *The rise and fall of Czech capitalism: economic development in the Czech Republic since 1989* (Cheltenham: Edward Elgar, 2003).

socio-economic structures were relatively like the Czech case. Thus, I use the term democratic capitalism for post-1989 Germany as well.

At this point, it is necessary to distinguish between *post-socialism* and *neoliberalism*. The Czechoslovakia and the Czech Republic, along with the "new" federal states of Germany, are often characterized as "post-socialist" due to the continuities with state socialism on cultural, political, and, in some cases, economic levels. [27] There are reasons for this in many cases, and it can be proper. However, I think that a more nuanced approach is necessary. For instance, the post-socialist transformation was enormously impacted by neoliberal influences, and many leading politicians in the former Soviet Bloc adopted neoliberal rhetoric. The transformation occurred under the post-socialist framework, and new economic structures emerged from the rest of the imploded state socialist regimes. Still, the transformations were influenced by many sides. Right after the notion of post-socialism, it is also necessary to elaborate more on the second key term: neoliberalism. Michal Kopeček tries to answer the question about the influence of Western neoliberalism in the former Soviet Bloc countries. He claims that neoliberalism significantly influenced new political elites and helped them develop a vision of the future that was radically different from the communist one, as well as the reformist "third path" vision. However, as Kopeček describes:

> "At the same time, however, it was not - and could not be - a sudden importation of the ideas of neoliberalism into the virgin soil of socialist society. The modes of thought as well as the practices of neoliberal governance were born in their basic elements from the political and economic thinking, mental patterns and cultural and social practices of post-socialism."[28]

[27] For instance Sharad Chari, and Katherine Verdery, "Thinking between the Posts: Postcolonialism, Postsocialism, and Ethnography after the Cold War," *Comparative Studies in Society and History 51*, no. 1 (2009).

[28] Michal Kopeček, "Úvod: Expertní kořeny postsocialismu: výzkumné perspektivy a metodologické nástroje" ["Introduction: expert roots of post-socialism: research perspectives and methodological tools"], in Michal Kopeček, *Architekti dlouhé změny: expertní kořeny postsocialismu v* Československu, 16.

The situation of combining post-socialist configuration with the neoliberal influences, mainly in Czechoslovakia and Poland, can be, in my view, accurately described by the term of Johanna Bockman and Gil Eyal, a "laboratory of economic knowledge."[29] Bockman and Eyal refer to the situation when new political elites offered Western neoliberal areas for economic experiments and supported neoliberal recipes in the West. Thus, the neoliberal transformations were not a direct implementation of neoliberal policies but rather the process of experimenting with what is possible within the post-socialist countries – in Czechoslovakia and "new" federal states, too. The post-socialist period and its neoliberal transformations cannot be described schematically just as straightforward establishing of neoliberal institutions such as a free-market economy, private capital, and liberalization of prices. Still, as I also show, it was about the continuity of influence of the state socialist managerial milieu and technocratic governance. Moreover, as one of the post-socialist neoliberal phenomena, Kopeček mentions the "atomization of social life," a rise in the influence of "unformal relationships," or the "growing importance of the socialist corporate sector as a counterpart of state and mainly party structures."[30]

I intend to go through the complex labyrinth of the history of state socialism and democratic capitalism using the political ecology framework on regimes in Czech Lands and East Germany to gain analytical distance from the researched materials. Rather than providing a positivistic inventory of decisions made by historical actors, I intend to characterize broader tendencies of *state socialist* and new *democratic capitalist* regimes in Czech lands and East Germany regarding the "social-nature" relations.

[29] Bockman, Johanna, and Gil Eyal, "Eastern Europe as a Laboratory for Economic Knowledge: The Transnational Roots of Neoliberalism," *American Journal of Sociology* 108, no. 2 (2002): 310–52.

[30] Kopeček, "Úvod: Expertní kořeny postsocialismu: výzkumné perspektivy a metodologické nástroje," 17

Sources and Methodology

The research is based on primary resources from official state documents or documents from the ruling parties. Typically, these consist of governmental or party memorandums, speeches on the party conventions, documents of five-year plans, governmental declarations, and reports from experts and scientific institutions, like local administrations.

The proposed thesis's comparative approach makes selecting the possible sources more difficult. Both countries ended during the 1990s; the reunification of Germany created a new political order, and Czechoslovakia split into two new states, the Slovak and Czech Republics. The main thesis employs a methodological approach of comparative analysis to trace ecological policies as diverse practices performed by different actors. I consider these policies not only as the set of measures that have emerged from the commonly shared need to address environmental damage but rather from the necessity to organize relationships between ecosystems and political, social, and economic systems.

I examine official and internal documents from state or political parties to conduct my analysis. The main source of archival documents for the German context was Bundesarchiv (Federal Archive). I used documents from the National Archive in the case of Czechoslovakia and the Czech Republic. There is a thirty-year protection period in both countries, so in most cases, I was not allowed to get sources from ministries and state institutions after 1993. However, I gathered sources from GDR's Bundesamt für Naturschutz (Federal Agency for Nature Conservation Fund), the Generaldirektor (Director General Fund), and three ministries: the Ministerium für Kohle und Energie (Ministry for Coal and Energy Fund), the Ministerium für Umweltschutz und Wasserwirtschaft (Ministry of Environmental Protection and Water Management Fund), and the Ministerrat der DDR (Council of Ministers of the GDR Fund). Among the research documents are reports on progress in ecological policies and analyses of the state of the environment and energy sector in the countries. In Prague's National Archive,

I researched the funds of the Ústřední výbor 1945-1989 (KSČ – Central Committee 1945-1989) and fund of the Úřad vlády ČR (Czech Governmental Office) where placed materials from government meetings, materials for decision-makers and minutes from ministry meetings. For the period after 1989, I used documents mainly from the fund of the Ministerstvo životního prostředí (Ministry of the Environment). These documents were created for political purposes and represented various political agendas, so it's important to approach them with analytical distance. To achieve this, I have utilized data and information from multiple sources, including party memorandums, speeches at party conventions, and documents related to the five-year plans, both internal and official sources. For more 1990s documents, I got materials from the internet archive of the Bundestag (German Parliament) and from published materials from the German and Czech governments, such as program declarations or minister's speeches.

I structure the thesis's comparison around two axes - temporal and spatial. The thesis timeline is divided into pre- and post-1989 periods. The spatial axis includes Czechoslovakia, the Czech Republic, and the Slovak Republic on one side, and East Germany and reunited Germany on the other. Although this design is complex, combining these cases to reveal crucial information and consequences required to answer the research questions posed above is necessary.

In designing the comparison, it is essential to note that this comparison between pre-1989 state socialism regimes and post-1989 democratic capitalism is diachronic. Thus, there cannot be any definitive conclusion about the ecologically irresponsible "totalitarian regime" compared to the supposedly responsible democratic capitalism. [31] This is because post-1989 regimes were successors of state socialist ones, and as I show, they inherited many policies that were put into force in the last years of state socialism. Therefore, the diachronic comparison

[31] About responsibility of the "totalitarian" communist regime for ecological degradation wrote Josef Vavroušek here: Josef Vavroušek ed., *Návrh zásad státní ekologické politiky* [*Proposal of the Principles of State Ecological Politics*]. Czech National Archive, Prague, Ministery of Environment, item 145, 1.

on the time axis of my thesis is more about showing what has changed and what has remained the same than about blaming one regime or another.

On the spatial axis, I compare mainly two regions: Czech Lands, mostly northern Bohemia, and eastern Germany, especially Saxony. These two regions were included in the 1980s and 1990s in many state entities: Czech Lands in the Czechoslovak Socialist Republic, after the 1989 Czech and Slovak Federative Republic, and lastly in The Czech Republic. In the post-war period in eastern Germany, the GDR, and after the reunification, became a part of the German Federal Republic. Comparing the area with changing state entities has many possibilities, but it also has its limitations. Historian Thomas Lindenberger points out that comparing the GDR with other Eastern Bloc countries is challenging.[32] According to Lindenberger, in regions like Brandenburg, Saxony, and Silesia, industrial modernization occurred decades before the state socialist regimes were established. Unlike the Soviet Union, Poland, or Hungary, industrial modernization did not spread as widely in Germany, and the specific nature of the SED dictatorship regime stemmed from this, he claims. Lindenberger suggests that "Czechoslovakia, with its similarly long history of modern industry, working-class culture, and state-sponsored social policies, is best suited for a direct comparison."[33] Therefore, instead of making broad conclusions about state socialist regimes in general, I am exploring the potential for ecological policies in the highly industrialized Central European societies of Czechoslovakia and the GDR during the late state socialism period and beyond in the post-1989.

[32] Thomas Lindenberger, "Unfit for Comparison? East German State Socialism as a "Case" of Industrial Society," *Divinatio*, no. 44, (2017): 165-178.

[33] Lindenberger, "Unfit for Comparison? East German State Socialism as a "Case" of Industrial Society."

Thesis Structure

I divided the thesis into three chapters. In Chapter 1, I examine the period of the 1980s in Czechoslovakia and the GDR. To provide a comparative analysis, I review most of the significant decisions and strategies concerning industrial air pollution, as well as diplomatic negotiations between the governments of both countries. Chapter 2 primarily offers a more in-depth look into the transformation period after 1989 and then provides insights into the following development in the field of politics of industrial air pollution at the beginning of the 1990s. It examines the formulation of environmental policies under the new political circumstances. Finally, in Chapter 3, I bring interpretations of the research results, and I aim to answer research questions and provide three key theses by which I want to characterize the politics of industrial air pollution in both countries.

1. STATE SOCIALIST POLITICS OF INDUSTRIAL AIR POLLUTION

> "The main aim of the Czechoslovak Communist party, which the party continually follows, is to increase standards of living of our nation, satisfy the material and spiritual needs of the population, on a qualitatively higher level, strengthen the security of social and individual livelihoods, and create ever more favourable conditions for harmonious development of man."[34]
>
> Politics of the Communist Party of Czechoslovakia in the Creation and Protection of the Environment, 1986.

> "The German Democratic Republic's environmental policy is an integral part of an overall policy aimed at human welfare and peace. It corresponds to the objective, which was set out well in advance in the SED program, 'to preserve nature as a source of life, material wealth, health, and enjoyment for people and to use it rationally on a scientific basis... so that it can be used in a safe manner and happily by future generations in a communist society.'"[35]
>
> Proposals for the Development of Environmental Protection in East Germany until the year 2000, 1988.

For decades, chimneys all around the GDR and the Czechoslovak Socialist Republic released enormous clouds of toxic emissions directly into the air. The region in the middle of Europe was rich in coal, especially lignite (low-quality coal with a high percentage of sulphur, mercury, and other toxic substances), which was the basis for the industrial capacities of both

[34] *Hlavní směry hospodářského a sociálního rozvoje ČSSR na léta 1986-1990 a výhled do roku 2000* [*Main Directions of Economic and Social Development of CSSR between 1986 and 1990 and Outlook to the 2000*], in: *Sborník hlavních dokumentů 17. sjezdu Komunistické strany Československa: 24. března - 28. března 1986* [*Proceedings of the 17th Congress of the Communist Party of Czechoslovakia: 24 March - 28 March 1986*] (Prague: Svoboda, 1986), 150.

[35] *Vorschläge zur Entwicklung des Umweltschutzes in der DDR bis zum Jahre 2000* [*Proposals for the Development of Environmental Protection in East Germany until the year 2000*], 1988, Bundesarchiv (Berlin), DK 5, Sign 1824, 2.

countries. In the 1980s, the energy produced by burning lignite coal from several large surface mines powered the everyday lives of millions of inhabitants and was one of the foundational sources of their economic performance. The prosperity from coal energy sources was relatively cheap in terms of finances, and domestic sources brought security to an energetic generation during the Cold War clash between two rivalling blocks. Both regimes in the GDR and Czechoslovakia knew that a large part of their legitimacy depended on stability, guarantee of social advancement, and the ability to produce consumer goods.[36] And all of that was propelled by burning lignite coal.

Nonetheless, costs on the side of the environment, health of inhabitants, and natural ecosystems were enormous. High levels of pollution, especially sulphur dioxide emissions, caused acid rains, damaging large forest areas in the borderlands between Czechoslovakia and the GDR. Pollutants harmed soil and water in the countryside, leading to decreased crop yields and a broader occurrence of various diseases, which increased costs in the health care system, as reported analysis on both sides of borders.[37] Large construction projects like the Nové Mlýny dam or the Gabčíkovo-Nagymaros water dams on the Danube's biodiverse wetlands became symbols of socialist regimes' ignorance of ecosystems and living environments.[38] The ruling elites in Czechoslovakia and the GDR knew this contradiction well, and in the 1980s, they intensified efforts to face what Czechoslovak communists called "ecological problems." Overall, they were trapped in a dilemma between the need for a highly productive and intensive economy based on fossil fuel energy, which can deliver enough capacity for continuing

[36] See Martin Sabrow, "Socialism as Sinnwelt: The Communist Dictatorship from the Perspective of Cultural History" in *Soudobé dějiny/CJCH 19*, 2 (Jun 2012), 196-208, or Pavel Kolář, and Michal Pullmann, *Co byla normalizace?: studie o pozdním socialism* (Prague: Nakladatelství Lidové noviny, 2016).

[37] Emil Hadač, ed., "Rozbor ekologické situace ČSSR" ["Analysis of the Ecological Situation in the CSSR"] in Blanka Císařovská, and Vilém Prečan ed., *Charta 77: Dokumenty 1977–1989* (Prague: Insitute for Contemporary Hisotry, 2007), 562-578, and variety of reports made by the GDR´s Ministery of Environment Protection and Water Management. Bundesarchiv (Berlin), DK 5, Sign 1314 and 2181.

[38] See Spurný, "Mezi vědou a politikou. Ekologie za socialismu a kapitalismu (1975-1995)".

struggle with the "imperialists West" and maintaining public legitimacy, and on the other hand, the situation of the nature ecosystem and living environment for inhabitants.

Communists themselves came to mention this dilemma throughout the 1980s in official statements and prepared a variety of policies regarding the decrease of pollution levels. The basic strategy was the same for both socialist regimes: increase the effectiveness of the production process by modernization and, by that, decrease the material costs of the economy. Ways how to achieve this were different in Czechoslovakia and East Germany, but they shared a tendency towards technocratic solutions such as pollution filters of both domestic and western provenance, investments in gasification or construction of nuclear power plants, and creating complex warning systems or methods for recycling. In the late 1980s, the state-socialist regime faced public dissatisfaction due to environmental concerns despite investing heavily and making efforts to solve "ecological problems." These issues played a role in politicizing the public and creating oppositional groups in both countries and contributed to the implosion of the state-socialist regimes.

In this chapter, I examine the politics of industrial air pollution in Czechoslovakia and the GDR. By looking at the reports of official authorities, I want first to summarize the extent of environmental damage caused by air pollution and mention crucial debates regarding air pollution. Secondly, I present a few specific policies that socialist regimes in both countries introduced to tackle the "ecological problems." In the final part of the chapter, I analyse the plans and outlooks of both regimes regarding the future of energetics, economy, and environmental protection to reach a "communist society." nevertheless, these plans did not come to reality in the end. With insights from examining introduced policies and imaginations about the future, I claim that state socialist regimes had strong policies on preventing industrial air pollution, which consisted of technocratic green modernization.

1.1. "Ecological Problems" and Collapsing Ecosystems

The leading politicians of Czechoslovakia and the GDR were aware of the environmental situation during the 1980s. The *Ministry for Environmental Protection and Water Management* (*Ministerium für Umweltschutz und Wasserwirtschaft* – MUW) has been compiling annual summary reports that identify all major "ecological problems" and "key points" in the protection of natural ecosystems and living environments, and in its analysis, it can use scientific capacities of institutions such as environmental centre in Saxon city of Tharandt.[39] Hans Reichelt, the long-standing minister of Environmental Protection and Water Management, submitted these reports to the GDR's Council of Ministers, containing precise data on pollution levels, degradation, and land use. The reports outlined the potential impacts of utilizing ecosystem services, land, and raw materials and created a basis for the decision-making process within the state government.[40]

1.1.1. State of Knowledge about Industrial Air Pollution

For the GDR, the problem of air pollution was not something new. Levels of pollution had been observed for many decades, and publicly, the issue of air pollution had played an important role in public debates, at least since the 1960s, when the country went through a scandalous lawsuit between forestry companies and the power plants in Bitterfeld. The pollutants from the power plant destroyed thousands of hectares of forests, and Bitterfeld Combine and six other companies were forced to pay relatively high compensations.[41] Cases such as the Bitterfeld one were not rare, and decreasing air pollution levels and improving the

[39] More about the Academy of Forestry in Tharandt in Frank Uekötter, *Umweltgeschichte im 19. und 20. Jahrhundert* (München: Oldenbourg Wissenschaftsverlag, 2007), 10.

[40] Reports are available in the archive of the Ministery for Environment Protection and Water Management: Bundesarchiv (Berlin), DK 5, Sign 1314 and 2181.

[41] Tobias Huff, "Environmental Policy in the GDR: Principles, Restrictions, Failure, and Legacy", in Sabine Mödersheim, Scott Moranda, Eli Rubin, and Peter Lang, *Ecologies of Socialisms : Germany, Nature, and the Left in History, Politics, and Culture* (Oxford Wien: Peter Lang, 2019), 70-71.

living environment were among the main political promises of politicians from the SED on the regional and state levels.[42] No wonder since, during that period, the GDR was one of the largest global emitters of toxic emissions.

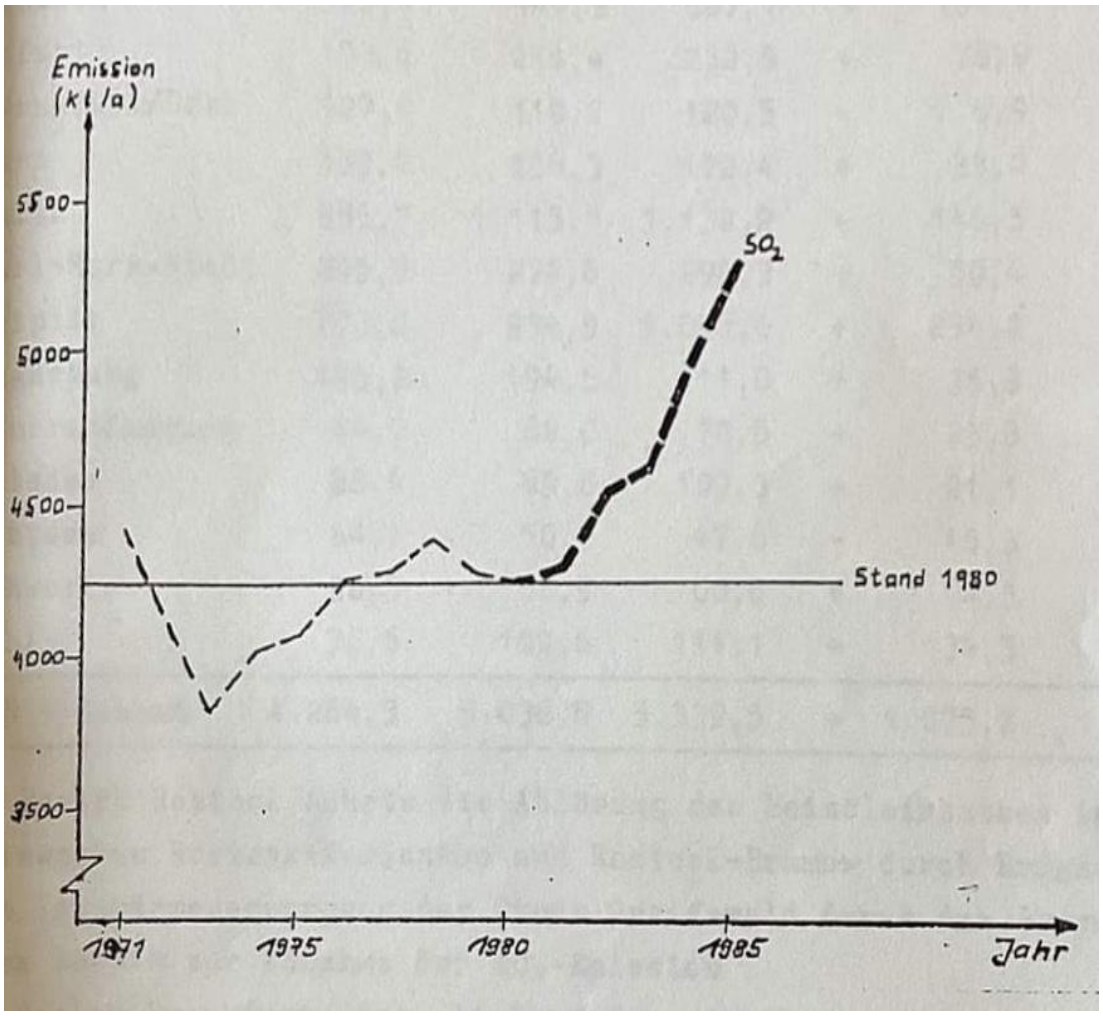


Figure 1 Development of sulphur dioxide emissions in the GDR. Ministry for Environmental Protection and Water Management, Zusammenfassung: Ergebnisse des Umweltschutzes 1981 bis 1985 [Summary: Results of environmental protection from 1981 to 1985], (1986), Bundesarchiv (Berlin), DK 5, Archivsignatur 2158, 16.

[42] See Huff, *Natur und Industrie im Sozialismus: eine Umweltgeschichte der DDR*, 166-252.

Throughout the 1970s and 1980s, the MUW collected data about the emissions and their impact on society. "Sedimentation dust pollutes 31 percent, and SO2 pollutes 44 percent of the population of the GDR," reported the MUW's analytics. The MUW also stated that: "…in the industrial metropolitan areas, the level of air pollutants remains high, although there is a slight local reduction in their effect, leading, among other things, to the migration of important workers from priority areas despite the housing construction programs."[43] The authors of the reports also warned that the higher levels of dust and sulphur dioxide in the air caused "economic harms" and a "decrease in the yields from crop and livestock production."[44] The situation was not better during the first half of the 1980s. Compared to the beginning of the decade, the sulphur dioxide emissions increased to 5.3 million tonnes, and the density of emissions increased from 40 tonnes of sulphur dioxide per square kilometre in 1980 to 49 tonnes in 1985 (see Table 4). "Territorially, the largest sulphur dioxide emissions are distributed between the districts of Choteboz, Halle, and Leipzig, which also recorded the highest absolute increases compared to 1980. The most polluted districts are Borna, Calau, and Merseburg," said the MUW in the 1986 report.[45]

To understand the scope of the pollution, it is important to note that most of the emissions were released in relatively small industrial regions of Saxony and northern Bohemia. Districts of Halle, Leipzig, and Cottbus produced at the beginnings of the 1980s incomparably high amounts of sulphur dioxide and dust in other regions of the GDR, and precisely in these districts, the chemical industry, metallurgy, and energetics concentrated.[46] North Bohemian

[43] *Bericht über die Ergebnisse der Entwicklung des Umweltschutzes in der DDR 1976 bis 1980* [*Report about the Results in the Development of the Environmental Protection in the GDR 1976 to 1980*], 1981, Bundesarchiv (Berlin), DK 5, sign 1314, 16.

[44] *Bericht über die Ergebnisse der Entwicklung des Umweltschutzes in der DDR 1976 bis 1980* [*Report about the Results in the Development of the Environmental Protection in the GDR 1976 to 1980*], 1981, Bundesarchiv (Berlin), DK 5, sign 1314, 17.

[45] *Zusammenfassung: Ergebnisse des Umweltschutzes 1981 bis 1985* [*Summary: Results of Environmental Protection between 1981 to 1985*], 1986, Bundesarchiv (Berlin), DK 5, sign 2158, 16.

[46] *Bericht über die Ergebnisse der Entwicklung des Umweltschutzes in der DDR 1976 bis 1980,* 1981, Bundesarchiv (Berlin), DK 5, sign 1314, 46.

industrial centres, including Ústí nad Labem, Most, Chomutov, and Litvínov, were known as the "chimney" of Czechoslovakia located on the other side of the border. In an area of approximately 7,800 square kilometres with a population of 1.2 million, only 11 percent of the country's total industrial production was produced. However, this area was responsible for 73 percent of Czechoslovakia's lignite production, 75 percent of uranium ore mining, and 39 percent of electricity production. The electricity production amounted to 5,444 MW of installed capacity, mostly from coal power plants, which helped produce many chemical facilities outputs such as lamp gas and fertilizers. Additionally, this region was responsible for most of the state's newsprint and float glass production.[47] Large coal deposits were often located in small regions with high population density, which led to the concentration of industrial capacity in those areas. The burning of coal and the growth of intensive industries based on fossil fuels led to significant changes in the social structures of some regions. For instance, the Bohemian city of Most was partially relocated and destroyed, and a new city was built in its place. However, the repercussions of these activities were not limited to just these small areas.[48]

[47] Vaněk, *Nedalo se tady dýchat*, 80-81.

[48] See Matěj Spurný, *Making the Most of tomorrow: a laboratory of socialist modernity in Czechoslovakia* (Praha: Karolinum Press, 2019).

Figure 2 Concentration of air pollution in the GDR in 1986. Bericht über die Ergebnisse der Entwicklung des Umweltschutzes in der DDR 1988 [Report on the results of the development of environmental protection in the GDR in 1988], 1989, Bundesarchiv (Berlin), DK 5, sign 1246, 50.

In 1983, a report on the ecological situation was submitted by a team of the Czech Academy of Science (CSAV), led by biologist Emil Hadač, at the request of a leading

communist group, primarily of the prime minister of the federal government and one of the technocratic members of closer leadership of the Czechoslovak Communist Party, Lubomír Štrougal. The report brought a complex summary of all the main parts of the living environment in Czechoslovakia:

> "About 3-4 million people live under the direct influence of CSR emissions, and about one-third of forests and at least 10 percent of agricultural land are affected. Air pollution from sulphur dioxide also causes damage through increased corrosion of various structures and materials, damage to cultural monuments and building facades, increased cleaning costs (municipal but also private), and so on. It can be roughly estimated that the damages amount to 15-20 billion Czechoslovak crowns annually."[49]

The report was submitted to Štrougal, who wanted to use the report as source material in negotiations within the Czechoslovak communist party and government structures. However, the authors of the report from the CSAV were in contact with the oppositional groups around the Charter 77, and one of the members of the CSAV team, Václav Mezřický, provided members of Charter 77 with the report. The report's findings and information about the state of the environment in Czechoslovakia were so disastrous for the state socialist regime that Charter 77 decided to publish the report with an accompanying letter for Lubomír Štrougal, where signatures called for more deceitful action. Additionally, the report was published in several Western media, such as Die Zeit and Le Monde, in 1984.[50] For Štrougal, it meant that he got to the defensive position within the party against the other members of the Central Committee, which opposed efforts on environmental protection.[51] The main failure of Štrougal's group in their plans regarding introducing of ecological policies was rejection of document called "Principles of state conception of creating and protecting environment and rational use of resources", which other members of KSČ's Central Committee proposed in

[49] Hadač ed., "Rozbor ekologické situace ČSSR," 563.
[50] Císařovská, and Prečan ed., *Charta 77: Dokumenty 1977–1989,* 578.
[51] Vaněk, *Nedalo se tady dýchat,* 121.

November 1985. The main aim of the principles had to be to restore the living environment in Czechoslovakia to the state from the turn of the 1960s and 1970s until 2000.[52] Nevertheless, Štrougal did not convince his more conservative comrades, and the decision about the principles was postponed.

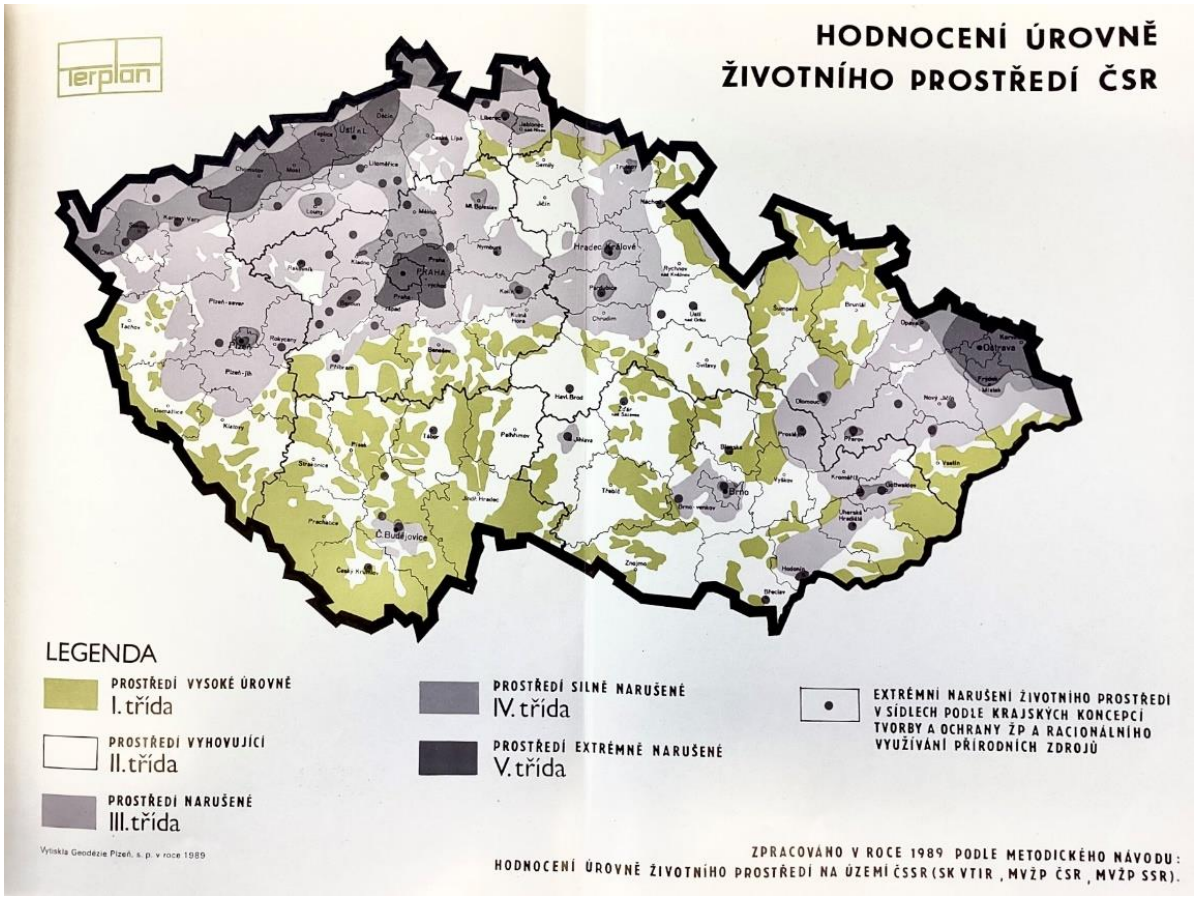


Figure 3 Evaluation of the environment in the Czechoslovakia. Vývoj a stav životního prostředí v ČSSR [Development and State of the Environment in the CSSR], 1989, National Archive, KSČ - Ústřední výbor 1945-1989, item 123, 62.

Despite this failure, Štrougal regained influence at the end of the 1980s, and a group of party members and experts on ecology and other environment-related fields developed a convincing amount of data and introduced some of the ecological policies. In the last months

[52] *Zásady státní koncepce tvorby a ochrany životního prostředí a racionálního využívání přírodních zdrojů* [*Principles of State Conception of Creating and Protecting Environment and Rational Use of Resources*], 1985, Czech National Archive, KSČ - Ústřední výbor 1945-1989, item 154, 1.

of the Czechoslovak state socialist regime, they had a relatively strong position and accelerated their efforts, which led to the moment of acceptance of revised principles of state environment protection just a few months before the start of the Velvet Revolution.[53]

And it was not just because of the work of Štrougal, other technocrats, and environmental experts. "Ecological problems" had taken on the urgency throughout the 1980s. One of the many symbols of the environmental damage related to coal use was the phenomenon of dying forests – in German *Waldsterben*, in Czech *lesní kalamity*. High levels of sulphur dioxide pollution, which caused acid rains, destroyed large areas of forests, mainly in border mountain ranges between the GDR and Czechoslovakia, mainly Erzgebirge/Krušné hory, Isegebirge/Jizerské hory, and Riesengebirge/Krkonoše. In the GDR, between 1983 and 1988, the proportion of damaged forests increased from 37 percent to 44.4 percent of the total forest area in the country, and pollution hit mainly pine and spruce populations.[54] "In the districts of Dresden and Karl-Marx-Stadt, the easy reproduction of spruce is no longer guaranteed," claimed a report on the state of the environment from 1989.[55] During the 1980s, the damage to the forests in East Germany increased significantly. This was due to the increased mining and burning of lignite, which was promised by Eric Honecker, the chief of the SED central committee and prominent leader of the GDR, at the beginning of the decade.[56] SED's government aimed to improve living conditions for East Germans, with the economic

[53] See KSČ. *ÚV. 15. zasedání Ústředního výboru Komunistické strany Československa ve dnech 11. a 12. října 1989* [*CC. 15th Session of the Central Committee of the Communist Party of Czechoslovakia on 11 and 12 October 1989*] (Prague: Svoboda, 1989), or KSČ, *Sborník dokumentů ze společného zasedání ústředních výborů Národní fronty ČSSR, ČSR a SSR: Praha 27. 6. 1989 [Collection of Documents from the Gathering of the Central Committees of the National Front of the Czechoslovakia, Czechoslovakia and the USSR: Prague, 27 June 1989]* (Prague: ÚV NF ČSSR, 1989).

[54] *Bericht über die Ergebnisse der Entwicklung des Umweltschutzes in der DDR 1988,* 1989, Bundesarchiv (Berlin), DK 5, sign 1246, 28-29.

[55] *Bericht über die Ergebnisse der Entwicklung des Umweltschutzes in der DDR 1988,* 1989, Bundesarchiv, 30.

[56] For instance Erich Honecker, *Bericht des Zentralkomitees der Sozialistischen Einheitspartei Deutschlands an den X. Parteitag der SED : X. Parteitag der Sozialistischen Einheitspartei Deutschlands ; April 1981 in Berlin* (Dresden: Zeit im Bild, 1981), 85-86.

performance based on increased coal use resulting in what historian Michele Dupuy called the "Waldsterben crisis."[57]

On the other side of the border, the situation was equally dire. Toxic pollutants severely weakened the forest ecosystem in the mountains surrounding the main polluted area, causing significant damage in all mountain ranges around the border. According to a report presented at the Central Committee gathering of the Czechoslovak Communist Party in October 1989, just weeks before the Velvet Revolution, forest damage occurred in a "continuous strip" from the city of Cheb in West Bohemia along the borders to Orlické hory on the other side of the republic. The report claimed that almost 30,000 hectares of forest ecosystems were destroyed by emissions in this large area, which was continuously afforested during the 1980s but with little success; new waves of pollution destroyed almost all attempts to reconstruct forest ecosystems.[58]

Sensible for the communists was the situation in the Krkonoše Mountains. Krkonoše was a national park since the beginning of the 1960s and was one of the main symbols of the communist endeavour to improve the living standards of Czechoslovaks by providing recreation opportunities in mountain resorts. Thousands of Czechoslovaks visited Krkonoše, including children and students, on school winter ski courses or workers in cottages and recreation complexes owned by companies or trade unions.[59] Throughout the 1980s, the pollution rose and at the end of the decade, the situation of Krkonoše's forests was critical:

> "The impact of pollutants on wild plants and wildlife has increased; the living environment of permanent residents and the recreational potential of the area has

[57] Michel Dupuy "Justifying Air Pollution in the GDR 1949-1989", in Sabine Mödersheim, Scott Moranda, Eli Rubin, and Peter Lang, *Ecologies of Socialisms : Germany, Nature, and the Left in History, Politics, and Culture* (Oxford Wien: Peter Lang, 2019), 130.

[58] *Vývoj a stav životního prostředí v ČSSR* [*Development and State of the Environment in the CSSR*], 1989, National Archive, KSČ - Ústřední výbor 1945-1989, item 123, 67.

[59] See Alžběta Kratinová, *Dovolená s poukazem: odborové rekreace v Československu 1948-1968* [*Holidays with a Voucher: Trade Unions Recreation in Czechoslovakia 1948-1968*] (Prague: Academia, 2014).

deteriorated; soil degradation and water acidification have occurred; forest ecosystems on the ridges have been severely disrupted; forest improvement structures and the network of secondary roads have fallen into disrepair.

(...)

The consequence of all these factors is that the recreational function of the Krkonoše as a recreation area of the capital city is in doubt."[60]

Ecological Optimisation of the Complex Development of the Krkonoše Mountains in the 8th Five-Year Plan and the Following Period until 2000, 4.

However, the destruction of forests was just one of the examples of the degradation of landscapes and ecosystems in both countries. For instance, at the end of March 1988, a large accident in the chemical works near Halle during which hundreds of tonnes of ethylene escaped to the fields around the chemical works and destroyed crops of tomatoes, wheat, and sugar beet on the 50 ha on the outskirts of village Teutschenthal.[61] In 1986, two severe oil accidents took place in one of the largest industrial centres of Czechoslovakia around the city of Ostrava. These accidents led to the pollution of tens of kilometres of riverbanks, even beyond the Czech-Polish border. The official cause of these accidents was negligence on the part of the operational personnel. However, the number of such accidents increased by over a third between 1981 and 1988.[62] This indicates that there were other reasons as well, such as old facilities without proper maintenance and lack of investments. Accidents, such as the one near Teutschenthal and in Ostrava, were not rare and had long-term systemic impacts on water, soil, and air pollution. In the GDR, the area of agricultural land has continuously decreased since

[60] *Ekologická optimalizace komplexního rozvoje Krkonoš v 8. pětiletce a návazném období do roku 2000* [*Ecological Optimalisation of the Complex Development of the Krkonoše Mountains in the 8th Five-Year Plan and the Following Period until 2000*]. Czech National Archive, Prague, Government Office of CSR/CR, item 83, 4.

[61] *Bericht über die Ergebnisse der Entwicklung des Umweltschutzes in der DDR 1988*, Bundesarchiv, 28.

[62] *Vývoj a stav životního prostředí v ČSSR*, 1989, Czech National Archive, 36.

1978.[63] The same but milder trend can be seen in Czechoslovakia, where approximately 35,000 hectares were used for mining and large areas of agricultural land took construction of large dams like Gabčíkovo–Nagymaros.[64]

1.1.2. Pollution as an Urgent Issue

Officials in East Germany and Czechoslovakia had to address the issue of pollution due to the risk of losing political support among citizens and diplomatic pressure from neighbouring countries. One of the biggest opposition campaigns in the GDR before 1989 was "A Mark for Espenhain" ("Eine Mark Für Espenihein").[65] A protest campaign was launched in response to the high levels of pollution from the Espenhain power plant and the inability of local officials to reduce pollution or convincingly inform the public about the issue. The coal power plant in Espenhain was one of the top ten polluters in the GDR, with outdated furnaces and inefficient coal-burning processes. The emissions from the plant affected around 450,000 people in the surrounding area, and local authorities were aware that the emissions from the power plant were exceeding the limits.[66] The Christian environmental group Rötha raised concerns about the pollution from the plant and organized a fundraiser for filters for the Espenhain power plant. However, as it was impossible to raise enough money to buy the filters, the point of the fundraiser was to collect signatures of donors, as collecting signatures for petitions was prohibited in the GDR. As a result, around 100,000 people donated to the fundraiser. According to historian Michel Dupuy, the Espenhain campaign followed a typical pattern of the late 1980s, when the official authorities of the state socialist regime in the GDR failed to convince the population about the benefits of intensive industry and the integrity of SED politicians to

[63] *Vývoj a stav životního prostředí v ČSSR,* 1989, Czech National Archive, 31.

[64] Jiřina Juláková, and Josef Vavroušek*, Zpráva o stavu životního prostředí v ČSFR* [*Report on State of Environment in CSFR*] (Praha: Vesmír, 1991), 40.

[65] More about the campaign in Walter Christian Steinbach, *Eine Mark für Espenhain: Vom Christlichen Umweltseminar Rötha zum Leipziger Neuseenland* [*A marrow for Espenhain: From the Rötha Christian Environmental Seminar to the Leipzig New Lake District*] (Leipzig Evangelische: Verlagsanstalt, 2019).

[66] Huff, *Natur und Industrie im Sozialismus: eine Umweltgeschichte der DDR,* 405.

tackle environmental issues. Environmental and Christian groups responded with public actions and campaigns, leading to a situation in which SED lost its position of leadership in finding solutions and informing the public. According to Dupuy, oppositional groups "in effect, created their own, new, public sphere."[67]

Espenhain's campaign was not just an isolated event. In the GDR and Czechoslovakia, vast numbers of environmental groups emerged throughout the 1980s, and one of the characteristic signs of the atmosphere in East German and Czechoslovak societies was growing sensitivity to ecological topics and the condition of the environment. In Czechoslovakia, there were a vast number of environmental groups and organizations, most under the umbrella of one of the official mass organizations. Groups include *Tis – Svaz pro ochranu přírody, krajiny a lidí* (*Tis – Union for Protection of Nature, Landscape, and People*), or *Brontosaurus Movement*.[68] Participants in these movements and organizations published several magazines, both officials the same as samizdat and some of them took part in the Charter 77 movement.[69] Despite this, communist officials, in many cases, were willing to support activities such as cleaning rivers and public spaces, helping in nature-protected areas, or participating in beautification clubs, which were all considered as "small ecology" and thus non-political, even called for the actions and campaigns. For many participants in these activities, participating meant an escape from the "normalization regime," mainly in the case of the so-called tramping movement.[70] During the 1980s, spending time in nature with friends during the weekend was seen as an act of rebellion, even though it was often officially endorsed by one of the state socialist mass organizations. In the latter part of the decade, there was an increase in political

[67] Michel Dupuy "Justifying Air Pollution in the GDR 1949-1989", 137.

[68] See Petr Jehlička and Joe Smith, "Trampové, přírodovědci a brontosauři. Předlistopadová zkušenost českého environmentálního hnutí jako předzvěst ekologické modernizace," ["Czech Tramps, Naturalists, and the Brontosaurus Movement: Pre-November experience of the Czech environmentalist movement as a portent of ecological modernization"] in *Soudobé dějiny*, 24, 1-2 (2017), 78-101.

[69] Kristina Andělová, "Existoval chartistický environmentalismus? Charta 77 a reflexe životního prostředí."

[70] Kristina Andělová, "Existoval chartistický environmentalismus? Charta 77 a reflexe životního prostředí" or Matěj Spurný, "Mezi vědou a politikou. Ekologie za státního socialismu a kapitalismu (1975-1995)."

activities that were more explicit in nature. Some examples of this included the release of a report on the state of the environment in the main city of the Slovak Republic, Bratislava, called *Bratislava/nahlas* (*Bratislava/aloud*).[71] In the Czech part of the republic, the action group *Pražské matky* (*Prague Mothers*) organized in the form of a demonstration in which they wanted more information on pollution levels in the main city of Prague.[72] These actions were just a few examples of the general discontent with the state-socialist government that was prevalent in many regions across Czechoslovakia. Public involvement in response to the growing degradation of the environment had many forms in the GDR and Czechoslovakia; the common phenomenon was that it was raised throughout the last decade of state socialist regimes in both countries.

1.1.3. Troubles in Diplomacy

The second serious trouble that was provoked by the high levels of emissions was trans-border transmissions and the pollution of neighbouring countries. A report for members of the Czechoslovak communist party central committee from 1989 stated that "due to the North Bohemian Region, particularly the affected Ústí-Chomutov area, Czechoslovakia became one of the world's most significant exporters of air pollutants."[73] The northern region of Bohemia was not an independent area but rather a part of a large trans-border region that had rich coal deposits and sources of pollution, such as mines, power plants, and intensive industry. This area, commonly referred to as the "black" triangle, was located between the GDR (partially Federal Republic of Germany), Czechoslovakia, and the Polish People's Republic. It was a hub

[71] Bratislava/nahlas was not only a research project that uncovered information about which state-socialist regime aimed to keep quiet but also an opposition group. It was founded mainly by members of the official Slovak Association of Nature and Landscape Protectors. The group gathered people based on their dissatisfaction with the state of the environment in the late 1980s. More in Júlia Čížová, and Michal Ďurčo, "Pozitívna deviácia v Československu v 80. rokoch: Prípad bratislavského environmentálneho hnutia" ["Positive Deviance in 1980s Czechoslovakia: The Case of the Bratislava Environmental Movement"] in *Historický časopis,* 2022, 70, 3, Bratislava, 461–486.

[72] More about bot cases of *Bratislava/nahlas* and *Pražské* matky in Vaněk, *Nedalo se tady dýchat*.

[73] *Vývoj a stav životního prostředí v ČSSR*, Czech National Archive, 67.

of heavy industry and had been heavily reliant on coal since the beginning of the Industrial Revolution in Central Europe. The triangle was considered the "engine" of fossil economies of state socialist regimes, but seemingly the large "chimney" which launched thousands of tons of various types of pollution per day. As air pollution does not respect state borders, the emitted pollution affected not just the biggest producers, such as the GDR and Czechoslovakia, but all neighbouring countries.

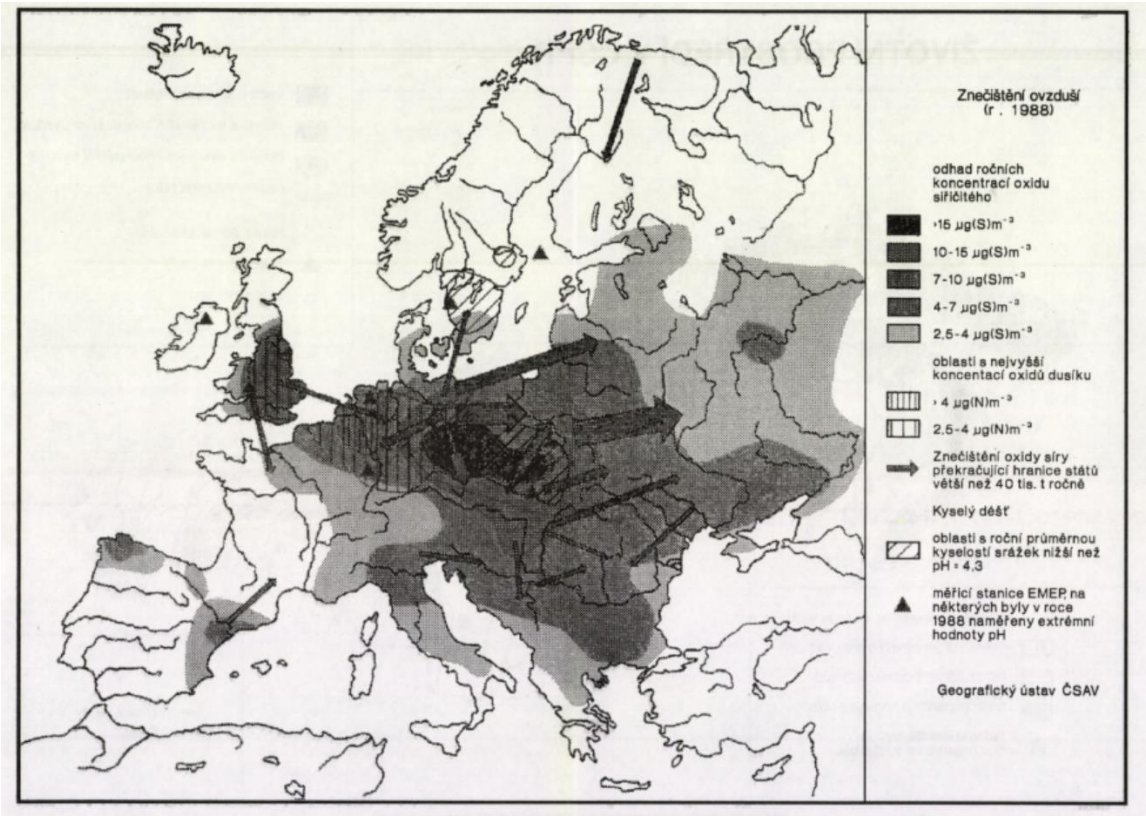


Figure 4 Air Pollution in 1988. Jiřina Juláková, and Josef Vavroušek, Zpráva o stavu životního prostředí v ČSFR [Report on State of Environment in CSFR] (Prague: Vesmír, 1991).

The GDR and Czechoslovakia were the primary global emitters of sulphur dioxide per square kilometre.[74] During the early 1980s, the GDR had the highest sulphur dioxide emission rate in the world, with 40 tonnes per square kilometre annually. Czechoslovakia was the second-highest emitter, while Poland was in fifth place. This made them outperform countries such as France, the Soviet Union, and the United States. These three countries also ranked high in other pollutants like nitrogen and carbon dioxide.[75]

Depending on the weather patterns, the transmission of toxic substances across borders contributed significantly to the pollution levels in Central Europe, Denmark, and Sweden (Figure 4). This trans-border pollution raised the need for efforts to decrease air pollution and its transboundary transfers, which concerned mainly Swedish authorities. They recognized that without cooperation with the Central European government, it was impossible to solve the problem, so Swedish diplomacy launched efforts to sit at the table along with the opponents behind the Iron Curtain from Czechoslovakia and the GDR.[76] The endeavour resulted in the signing of the Convention on Long-Range Transboundary Air Pollution in 1979 in Geneva, which was followed by the protocol on reduction of sulphur dioxide emissions in which all parties committed to reducing emissions and their transboundary fluxes by at least 30 percent – the GDR and Czechoslovakia were among the signatories.[77] However, the GDR falsified statistics on pollution, and the convention became one of the vehicles of pressure on the central European regimes regarding pollution levels and the issue of emissions and their border transmission was on the agenda of vast negotiations between the GDR, Czechoslovakia, and other European countries.

[74] Hadač ed., "Rozbor ekologické situace ČSSR," 564. Although Hadač's team did not provide the exact sources for their data, later data from the EMEP program, which was established after the signing of the Convention on Long-range Transboundary Air Pollution (LRTAP) in 1979, confirmed the trends in pollution levels.

[75] Hadač ed., "Rozbor ekologické situace ČSSR," 564.

[76] Armin Rosencranz, "The ECE Convention of 1979 on Long-Range Transboundary Air Pollution," in *The American Journal of International Law 75*, no. 4 (1981), 975–82.

[77] Armin Rosencranz, "The ECE Convention of 1979 on Long-Range Transboundary Air Pollution," and Michel Dupuy "Justifying Air Pollution in the GDR 1949-1989", 129.

Additionally, pressure on Czechoslovakia and the GDR in the case of the decreasing high pollution levels also consisted of media production in the Western countries, where, especially in the Federal Republic of Germany, stories about polluted air, water, soil, and its costs were exposed to many readers. As the publication of the report on the ecological situation in Czechoslovakia in several influenced Western media outlets showed, the power of the media played a significant role in the emergence of urgency among officials in both state socialist countries. For instance, one of the members of the team around leading communist Lubomír Štrougal, Jaromír Sedlák, recalled that publication of *Report on Ecologic Situation* from 1983 in several western media had a significant effect on diplomatic negotiations: "As far as I can remember, every international delegation that came with Lubomír Štrougal and Bohumil Chňoupek (minister of foreign affairs) at the governmental level (especially the Germans, and specifically the delegation from neighbouring Bavaria) did not forget to raise the issue of environmental solutions in Czechoslovakia."[78] In the discussion about the influence of media, the negative image of the GDR established in the 1980s played a significant role in delegitimizing the dictatorship of the SED. This narrative was widely presented to the Western public, particularly in West Germany, and contributed to the idea that the GDR was on the verge of collapse. Additionally, this narrative helped establish West Germany's environmental policy as a model case despite West Germany being a major emitter of sulphur dioxide.[79] It could not make any difference that the GDR falsified pollution statistics, and, as historian Tobias Huff pointed out, officials of the GDR repeatedly denied the existence of dead forests in the country.[80]

[78] Quotation from interview made by Miroslav Vaněk with Jaromír Sedlák in 1995. In Vaněk, *Nedalo se tady dýchat*, 122.

[79] Huff, *Natur und Industrie im Sozialismus: eine Umweltgeschichte der DDR*, 54-55.

[80] Huff quoted interview with Eric Honecker published in 1986 in Die Zeit. Huff, *Natur und Industrie im Sozialismus: eine Umweltgeschichte der DDR*, 7.

Towards the end of the 1980s, the Czechoslovak communists and their counterparts in the GDR acknowledged that the situation had become "critical." "Ecological problems" that were considered by officials of the Czechoslovak communist party as isolated harms to nature had increased to the extent that even official party reports perceived the situation as critical. The concentration of industrial facilities in the relatively small area in the north of Bohemia and southern districts of the GDR had caused air pollution to spread above Central Europe, leading to an environmental crisis. Over time, the ecosystems in both countries gradually deteriorated and broke down to the extent that they threatened to be unable to maintain the main ecosystemic services necessary for further economic growth and sustaining growing living conditions. This situation demanded an answer, and a growing number of members of the SED and KSČ, as well as members of the governments and governmental expert groups, attempted to set up policies to address the emerging crisis.

At the beginning of the 1980s, state socialist regimes in Czechoslovakia and the GDR faced the pressure of large amounts of pollution and the threat of collapsing ecosystems. Both regimes had to solve a variety of challenges, mainly the stagnation of living standards. The two oil shocks of the 1970s severely affected the East German economy. It relied heavily on the Soviet Union to import a large number of primary energy resources. As a result of price differences, the GDR's external debt continued to increase, which also hindered efforts to address "ecological problems."[81] The Czechoslovak regime had similar troubles – salaries and living standards remained stagnant throughout the 1980s. This raised concerns among regime leaders and allowed technocrats to gain more influence within the "normalization" regime of

[81] However, according to Ray Stokes, the oil shock did not cause the collapse of the GDR. Rather, it weakened the many layers of the national economy. Ray Stokes, "From Schadenfreude to Going-Out-of-Business Sale: East Germany and the Oil Crises of the 1970s" in Hartmut Berghoff, and Uta A. Balbier ed., *The East German Economy, 1945-2010 : Falling Behind or Catching Up?* (Cambridge: Cambridge University Press, 2014), 131-160.

regime leader Gustav Husák.[82] In this situation, prominent figures from both regimes called for faster economic growth through modernization and the introduction of new methods for economic management in order to fulfil their key promises regarding living standards for the population. However, the pursuit of economic growth highlighted the fact that the economies of the GDR and Czechoslovakia were heavily dependent on burning fossil fuels, which resulted in environmental damage and health issues for the inhabitants. State socialism in Central Europe during the 1980s was facing a civilizational dilemma, and the leaders of the SED and the KSČ regimes were seeking a way out of it. What were their proposed solutions?

1.2. Finding a Way from the Dilemma: Strategies of Solution

As the answer to this civilizational dilemma, the KSČ devised a set of modernization policies. For the XVII. the Party Convention in 1986, the Central Committee prepared a memorandum about the *Main Direction of Economic and Social Development in the Czechoslovak Socialist Republic for the years 1986 to 1990 with the Outlook to the year 2000,* which proposed modernization and increasing effectiveness through the application of "scientific-technological progress" on all level of the national economy to continue in "the increasing standards of living of our nation, satisfying the material and spiritual needs of the population, on a qualitatively higher level, strengthening the security of social and individual

[82] Recently, there has been a growing field of research on the role of technocracy and technocratic reasoning in the decision-making process within the state-socialist regime in Czechoslovakia. Some of the main outcomes of this research have been documented in books: Václav Sommer, Matěj Spurný, and Jaromír Mrňka, *Řídit socialismus jako firmu: technokratické vládnutí v Československu, 1956-1989* [*Running Socialism Like a Private Company: Technocratic Governance in Czechoslovakia, 1956-1989*] (Prague: Insitute for Contemporary History, Czech Academy of Science, 2019) and Kopeček, et al., *Architekti dlouhé změny: expertní kořeny postsocialismu v Československu.*

livelihoods, and creating ever more favourable conditions for harmonious development of man."[83] The central committee set up eight policies which should lead to such outcomes:

1. Accelerate phasing in the newest results of scientific-technological progress to the production process and social practice.
2. Rising energetic effectivity of national economy.
3. Improve the management of metallic materials.
4. Achieve faster growth in foreign trade turnover.
5. Rising productivity of workforce.
6. Improve the efficiency of investment.
7. To improve the living and work environment of the population.
8. Permanently reflect and improve the system of planned economy.[84]

These priorities followed the traditional modernization logic of Czechoslovak communist officials from the 1960s, but besides the rising economic performance and improving living standards, the central committee often mentioned "creating and protecting the environment" as one of the final aims of modernization.[85] Regarding the problem of industrial air pollution, the memorandum suggested a continuous decrease in burning lignite, which is highly ineffective regarding the energetic production and release of carbon, nitrogen, and sulphur emissions. The coal power plants were supposed to be replaced by natural gas and mainly by nuclear power plants, which the central committee considered the pillar of the future Czechoslovak energy system and through which they wanted to stop the increase of industrial air pollution. The

[83] *Hlavní směry hospodářského a sociálního rozvoje ČSSR na léta 1986-1990 a výhled do roku 2000* [*Main Direction of Economic and Social Development in the Czechoslovak Socialist Republic for the years 1986 to 1990 with the Outlook to the year 2000*] in: *Sborník hlavních dokumentů 17. sjezdu Komunistické strany Československa: 24. března - 28. března 1986* [*Proceedings of the 17th Congress of the Communist Party of Czechoslovakia: 24 March - 28 March 1986*] (Prague: Svoboda, 1986), 150.

[84] *Hlavní směry hospodářského a sociálního rozvoje ČSSR na léta 1986-1990 a výhled do roku 2000,* 155-157.

[85] *Hlavní směry hospodářského a sociálního rozvoje ČSSR na léta 1986-1990 a výhled do roku 2000,* 159.

memorandum also mentioned doubling the financial budget for "ecological actions" such as installing pollutant separators in the industry and energetics or recultivating landscapes. The central committee also called for "considering care for the environment as an integral component of current party and state politics."[86] Thus, the ecological policies of KSČ can be described as a specific "green modernization" under the state socialist rule. Their goal was to integrate ecological considerations into the decision-making process. They aimed to use technological innovations, technocratic policies, and large construction projects to minimize the impact of the rapid acceleration of industrial modernity and economic growth on the natural environment. By making a modernizing escape forward, state socialist leaders aimed to address what they euphemistically referred to as "ecological problems" – the critical state of entire forest, river, or urban ecosystems teetering on the brink of collapse.

The elites of the SED regime in the GDR had similar approaches to potential solutions. In a speech in April 1981, Party General Secretary of the SED and head of the GDR, Eric Honecker, introduced key points of "Economic Strategy for the 1980s". According to Honecker, the main mission of the SED regime was to improve the "material and cultural standards of living" of the GDR's citizens by the accelerating pace of development of socialist production, increasing effectiveness, techno-scientific progress, and labour productivity growth," and stated, that "gaining economic effectiveness through modern science is increasingly becoming the dominant point of view."[87] In ten main points, Honecker introduced a new economic strategy, which consisted of using more technological solutions, rising effectivity, rational use of resources and energetics, heavy industry growth, and other policies, which were typical for the regime's economic policy even decades before the Honecker era.

[86] *Hlavní směry hospodářského a sociálního rozvoje ČSSR na léta 1986-1990 a výhled do roku 2000*, 185.

[87] Erich Honecker, *Bericht des Zentralkomitees der Sozialistischen Einheitspartei Deutschlands an den X. Parteitag der SED : X. Parteitag der Sozialistischen Einheitspartei Deutschlands ; April 1981 in Berlin* [*Report of the Central Committee of the Socialist Unity Party of Germany to the X. Party Congress of the SED : X. Party Congress of the Socialist Unity Party of Germany ; April 1981 in Berlin*] (Dresden: Zeit im Bild, 1981), 64-65.

No wonder that Honecker also repeatedly promised to increase the amount of mined and burned lignite despite the obvious ecological damage.[88]

However, as Tobias Huff pointed out, Honecker himself was quite suspicious of the "technocratic modernization" of the New Economic System of Planning from the 1960s, which was directly the main political line of his predecessor Walter Ulbrich: "Honecker also saw it as a threat to SED hegemony, as the technocrats did not necessarily have to be convinced socialists," Huff claims and adds that Honecker "pushed back the influence of the technocrats after taking office."[89] However, the "Umweltschutz Probleme" and environmental policies are precise examples of how Honecker turned to the side of technocracy in the 1980s.

In contrast to the GDR's case, Czechoslovakia used special terms in its ecological policies besides the "protection of the living environment." For Czechoslovak communists, the ecological policies were not mainly about the protection of some natural agents and ecosystems but more or less about "creating" an environment for "socialist man," as several legal documents state.[90] Thus, ecological policies aimed to construct a new, better environment for citizens and "improve" landscapes, cities, ecosystems, and the *web of life* to serve better and "improve living standards of the population." This notion of "creating and protecting the natural environment" was deeply rooted in the 1960s expert knowledge and leading political thought of that time. Philosophers such as Radovan Richta or his colleagues with environmental expertise, such as Zdeněk Lakomý or Miloš Holý, gained in the 1960s and 1970s relatively significant influence and set the course of Czechoslovak state socialist discourse about ecological policies until the end of the regime in 1989. The paradigm of "creating and protecting" allowed state socialist politicians to start with the planning and constructing large

[88] Erich Honecker, *Bericht des Zentralkomitees der Sozialistischen Einheitspartei Deutschlands an den X. Parteitag der SED : X. Parteitag der Sozialistischen Einheitspartei Deutschlands ; April 1981 in Berlin*, 85-86.

[89] Huff, *Natur und Industrie im Sozialismus: eine Umweltgeschichte der DDR*, 187-188.

[90] For instance *Zákon č. 40/1956 Sb. o státní ochraně přírody* [*Act No. 40/1956 Coll. on State Nature Protection*] in "Zákony pro lidi.cz," AION CS 2010–2024, last modified June 3, 2024, https://www.zakonyprolidi.cz/cs/1956-40

projects on "improving nature," such as constructing large dams, reforestation programs, or draining wetlands and narrowing river beds and labelled them as pro-environmental decisions.[91]

These proclamations, which primarily stressed modernization and technocratic reasoning, significantly impacted the specific policies related to industrial air pollution. In short, communist governments aimed to find cleaner engines for their countries' economies. However, structurally, state socialist regimes were still heavily reliant on natural resources and ecosystem services, which they perceived as a wealth of their countries that could be used without any additional costs. To use a concept of Marxian environmental historian Jason W. Moore, state socialist regimes relied on a "cheap nature" and attitude towards it as if the ecosystem services were "free gifts."[92] In the moments when the *web of life* consisted of natural and social ecosystems and raw resources started showing signs of exhaustion and decay, communists faced a practical but also ideological challenge. The next section examines the key decisions, investments, and instruments that state socialist regimes in East Germany and Czechoslovakia implemented to reduce pollution and face this challenge.

1.2.1. Cleaning Coal

Both state socialist countries invested significant amounts of money in projects aimed at reducing pollution. These projects mainly focused on installing pollutant separators and filter systems and making other modifications to power plant facilities to reduce emissions. Additionally, the projects involved gasification with the precondition that burning fossil gas,

[91] For broader context see Radovan Richta et al., *Civilization at the Crossroads: Social and Human Implications of the Scientific and Technological Revolution*. However, direct conceptualization of „creating and protecting nature" find in Zdeněk Lakomý, *Člověk mění svět: civilizace, kultura a životní prostředí* [*Humans are Changing the World: Civilisation, Culture and the Environment*] (Prague: Odeon, 1976), Miloš Holý, Josef Říha and Josef Sládek, *Společnost a životní prostředí* [*Society and Environment*](Prague: Svoboda, 1975) and Miloš Černý, Zdeněk Lakomý a Otakar Nový, *Životní prostředí pro člověka* [*Living Environment for Humans*] (Prague: Academia, 1973).

[92] Jason W. Moore, *Capitalism in the web of life: ecology and the accumulation of capital* (London: Verso, 2015), 10-18.

mainly imported from the Soviet Union, would be much less damaging to the environment than brown coal. In the case of the GDR, the government developed a method of desulphurization based on limestone admixture, which was added directly to the boiler with the lignite coal. Despite the economic challenges faced by both countries, spending on direct environmental investigations increased throughout the 1980s. The GDR and Czechoslovakia made efforts to clean up the coal-burning process and reduce emissions of toxic substances. According to investment reports from both countries, investments in environmental protection were often found to be ineffective.[93]

Filter systems have been developed on various principles. However, in all cases, removing sulphur dioxide as a waste product of burning lignite has been a technological challenge, as well as an expensive process. An audit report from 1989 about ecological investments stated that due to a lack of domestic technological capacities, the construction periods lengthened in the case of the two most important projects on desulphurization with installing filtration systems in the coal power plant Počerady in the north of Bohemia and Nováky in Slovakia.[94] The report also showed that all five projects of desulphurization, which were part of the 8th five-year plan and in the construction, had significant delays and could not be finished in the scheduled time; the other 57 "ecological projects" planned for the 8th five-year plan were not even started.[95] The Social-Economic Commission of the Central Committee has warned about the delay in installing filters. The commission has emphasized that if the delay continues, Czechoslovakia might miss the opportunity to fulfil its international commitment from the Helsinki Declaration of 1985, which was to reduce sulphur dioxide

[93] *Kontrolní zpráva o realizaci ekologických investic v 8. Pětiletce z hlediska závěrů XVII. Sjezdu KSČ* [*Audit Report on the Implementation of Environmental Investments in 8. Five-Year Plan according to Conclusions of the XVII. Congress of the Communist Party of Czechoslovakia*], 1989, Czech National Archive, KSČ - Ústřední výbor 1945-1989, item 102, and Emissionsbericht der DDR, 1988, Bundesarchiv (Berlin), DK 5, sign 2181, 3.

[94] *Realizace odsiřovacích zařízení v ČSSR* [*Implementation of Desulphurisation Facilities in Czechoslovakia*], 1989, Czech National Archive, KSČ - Ústřední výbor 1945-1989, item 102, 2.

[95] *Realizace odsiřovacích zařízení v ČSSR,* 1989, Czech National Archive, 1.

emissions by 30 percent.[96] The report highlights issues in the production and supply chains of ecological projects. Specifically, the production of electric, measuring, and computing components faced problems due to state companies failing to meet procurement requirements and supplying components that needed to possess the necessary capabilities. This led to difficulties in producing crucial facilities required for installing filtration systems, pushing the production capacities in Czechoslovakia to their limits.[97] Despite these troubles, in combination with buying filtration systems from the western producers and fabrication of some domestic facilities, Czechoslovakia was not able to desulphurise its coal power plants.

On the other side of the Erzgebirge, in the coal power plant located in Leipzig Area, the GDR regime attempted to launch a special program for desulphurization. The Institute for Energetics in Leipzig introduced a limestone additive process to the leading officials of the GDR government. The aim of this process was to reduce sulphur dioxide pollution significantly, and after the experimentation period, it demonstrated success. Minister for Environment Hans Reichelt was responsible for incorporating the process into state policies. The process consisted of adding lime to lignite before burning it in a power plant. In the former GDR, there were abundant deposits of limestone, so it was easy to obtain enough material from domestic sources. Ground limestone could also be added to any existing power plant. However, adding lime resulted in higher levels of dust pollution, so an electric separator was needed during the process. The effectiveness of the process was low – it could only reduce sulphur dioxide pollution by 40 percent. The waste material generated from the process can be used in various construction projects, such as roads or backfilling of mine tunnels.[98] On the order of the Central Committee, several power plants started testing this method at the end of the 1970s, and this progressed in the 1980s. However, the experiences with this method fell short of

[96] *Realizace odsiřovacích zařízení v ČSSR,* 1989, Czech National Archive, 1.

[97] *Kontrolní zpráva o realizaci ekologických investic v 8. Pětiletce z hlediska závěrů XVII. Sjezdu KSČ* Czech National Archive, 5.

[98] Huff, *Natur und Industrie im Sozialismus: eine Umweltgeschichte der DDR,* 261.

expectations. As historian Tobias Huff mentioned, only one power plant in Boxberg needed 100,000 tonnes of limestone in ten days, and the transportation capacities of GDR's railways were not able to transport enough lime to all power plants in the country.[99] The desulphurization process involving lime successfully reduced pollution and was implemented in many power plants in the GDR during the 1980s. However, due to high investment costs and limited capacity, lime usage was not considered a viable long-term solution. As the MUW report said: "Due to the insufficient degree of desulphurization and the high limestone requirement, use is limited to individual selected locations."[100] The report also mentioned that the commitment that the GDR's government made at the Helsinki conference to reduce sulphur dioxide emissions by 30 percent cannot be met. Thus, the efforts of MUW, especially Minister Hans Reichelt, to use lime as a technological solution for clearing the fossil fuel economy of the GDR were not quick enough. However, the report says that:

> "By 1988, 25 experimental or small-scale flue gas desulphurization systems had been installed in the GDR. A vast number of projects are in the pipeline for construction. However, state companies' efforts are still being hindered by the lack of suitable construction documentation, standardized components, and delays from main contractors or subcontractors."[101]

Filtration systems obviously were not enough. To support policies of "coal cleaning," experts in the GDR and Czechoslovakia suggested introducing a signal system for air pollution monitoring. In areas with the largest sources of pollution and their surroundings, the meteorological agencies had to prepare monitoring stations that would bring information about actual levels of emissions to the centralized operation centres. If levels of pollution cross limits, the operation centre should warn leading officials in the area and take action to "secure the

[99] Huff, *Natur und Industrie im Sozialismus: eine Umweltgeschichte der DDR*,, 262.
[100] *Bericht über die Ergebnisse der Entwicklung des Umweltschutzes in der DDR 1988,* 1989, Bundesarchiv, 23.
[101] Emissionsbericht der DDR, 1988, Bundesarchiv, 23.

health of the population." The Council of Environment of the Czechoslovak government submitted a position that described what implementing such a system should mean:

> "We also consider it important that the information of the signal system will, as shown by the experiences of the North Bohemian KNV, be used for extraordinary measures in school, health, social, and physical education facilities, such as limiting the time spent in the outside, supplementing the diet with vitamin C and dairy products, as well as certain measures in treatment facilities."[102]

The first parts of the monitoring system came into operation in 1981, and during the 1980s, the number of monitoring stations grew. Stations were operated by the Czechoslovak Hydrometeorological Institute, and throughout the 1980s, they informed local KSČ's officials about actual levels of emissions and air pollution. The system also counted the emergent turn-off of large sources of pollution, such as chemical works and mainly lignite power plants, which also happened several times. For instance in power plants Tušimice and Počerady in the winter 1982, when operators used coal with lower share of sulphur and decreased electric generation.[103] However, hygienic limits on pollution were continually crossed and caused higher rates of a wide range of respiratory and cancer diseases.

[102] *Stanovisko X. oddělení ÚV KSČ ke "Zprávě o zabezpečení postupné realizace prognózního a signálního systému a opatření k omezování emisí v Severočeské hnědouhelné pánvi a v dalších oblastech ČSSR"* [*Opinion of the Xth Department of the Central Committee of the Communist Party of the KSČ on the "Report on Ensuring the Gradual Implementation of the Forecast and Signal System and Measures to Limit Emissions in the North Bohemian Lignite Area and Other Areas of the Czechoslovak Socialist Republic"*], 1989, Czech National Archive, KSČ - Ústřední výbor 1945-1989, item 83, 1.

[103] *Zpráva o zabezpečení postupné realizace prognózního a signálního systému a opatření k omezování emisí v Severočeské hnědouhelné pánvi a v dalších oblastech ČSSR* [*Report on Ensuring the Gradual Implementation of the Forecast and Signal System and Measures to Limit Emissions in the North Bohemian Lignite Area and Other Areas of the Czechoslovak Socialist Republic*], 1989, Czech National Archive, KSČ - Ústřední výbor 1945-1989, item 83, 4-5.

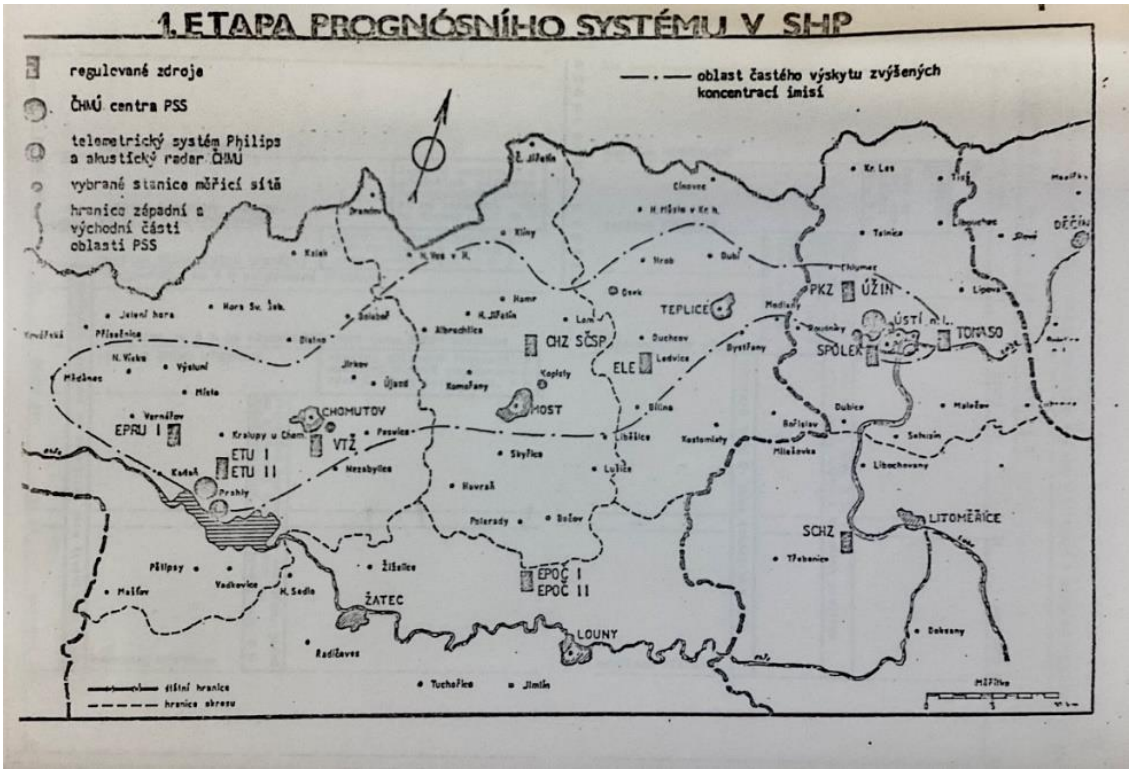


Figure 5 1st Stage of the Prognosis System in Northbohemian Browncoal Area. Zpráva o zabezpečení postupné realizace prognózního a signálního systému a opatření k omezování emisí v Severočeské hnědouhelné pánvi a v dalších oblastech ČSSR [Report on Ensuring the Gradual Implementation of the Forecast and Signal System and Measures to Limit Emissions in the North Bohemian Lignite Area and Other Areas of the Czechoslovak Socialist Republic], 1989, National Archive, KSČ - Ústřední výbor 1945-1989, item 83, Annex 1.

The signal and monitoring system was established through collaboration between the GDR's MUW. In order to discuss and prepare measures for improving the signal system, East German and Czechoslovak authorities organized expert groups and sent delegates annually. East Germans also developed a similar monitoring system to track pollution levels across the country. They gathered information about the biggest polluters and monitored meteorological patterns that influenced pollution levels and cross-border emissions. The purpose of the monitoring was straightforward: coal burning is inevitable, so local administration should adjust to it, and by gathering information about the emission levels, the technocrats in the KSČ and SED can manage high pollution situations by introducing adaptation measures.

To summarize, policies focused on the clearing of the process of generation of electricity from coal were the main parts of the ecological investments in the GDR and Czechoslovakia, accompanied by investments in the monitoring and warning systems. Besides the lime additive process, filter installation, and signal systems, the scientists and expert groups tried to develop various other policies to adapt to the impact of higher pollution levels. For instance, the Tharandt experimental forestry station developed several modifications of plant species that showed resistance to some limited amounts of sulphur dioxide.[104] Nonetheless, these policies, which had to mitigate pollution or adapt various economic sectors and populations to the "ecological problems," were not the only way state socialist regimes wanted to solve the crisis. One of the main decisions of the elites of SED and KSČ, which was also motivated by troubles with air pollution, was the construction of nuclear power plants in both countries and investments into expensive nuclear programs.

1.2.2. Nuclear Silver Bullet

Investments in nuclear power were recognized by KSČ officials as vital to the future of the Czechoslovak economy. In the publications of the Council for Environment, which was the advisor committee of the Czech national government from the late 70s, the government experts stated: "The fulfilment of long-term nuclear program is one single progressive way for the economic development of Czechoslovakia, raising of standards of living the people and consistent improvement of the environment which is devalued by running of coal power plants."[105] Nuclear power plants had to be a solution for unsustainable energetic systems and an accelerator of economic growth, thus taking the regime and Czechoslovakia out of the paradoxical situation. Central committee plans mentioned that by the end of the millennium,

[104] Michel Dupuy "Justifying Air Pollution in the GDR 1949-1989", 131.
[105] František Peřina, Jiří Marek and Václav Blecha, *Jaderná energetika a životní prostředí* [*Nuclear Energy and the Environment*](Prague: SNTL, 1986), 9.

the share of electricity and heat from nuclear plants would be 52 percent of all produced energy in Czechoslovakia. The first atomic power plant near the Slovakian village, Jaslovské Bohunice, made energy in 1972, and until the half of the 80s, the communist regime built up five nuclear reactors, which produced 13 percent of electricity in Czechoslovakia, and the other ten reactors were under construction or in the preparation phase.

Nuclear energy was also perceived as a "critical" part of energetic politics in the GDR. In 1979, materials for discussion in the council of ministers and a team of experts from the State Planning Commission claimed that nuclear energy would substitute fossil fuel sources, mainly brown coal, and, according to the State Planning Commission, would be necessary to develop enough capacities to cover all energetic production, because of the limited sources of lignite in the GDR.[106] In the GDR, two nuclear power plants, one on the Baltic coast in Greifswald with four finished nuclear reactors in 1979 and a second small power plant in Rheinsberg. The state socialist regime also started with the demanding construction of the Stendal nuclear power plant with large 1000 MW reactors, but until the end of the SED regime, the power plant was not connected to the grid.[107] In the report on the emission levels, MUW mentioned that for reducing pollution and achieving "rational use of energy," it is "necessary to develop further energy sources and to secure the planned growth in electrical energy production based on nuclear energy."[108] Thus, the experts among the state socialist apparatus considered constructing larger capacities of nuclear energy as an inevitable way of "green modernization."

[106] *Diskussionsgrundlage: Ausgangspunkte für die strategisch begründere "Konzeption zut Entwicklung der Kernenergetik und der friedlichen Anwendung der Kernenergetik und der friedlichen Anwendung der Kernenergie auf anderen Gebieten im Zeitraum 1981 – 1985"* [*Materials for discussion: Starting points for the strategically justified "Concept for the development of nuclear energy and the peaceful application of nuclear energy and the peaceful application of nuclear energy in other areas in the period 1981 – 1985"*], 1979, Bundesarchiv (Berlin), DE 1, sign. 58933, 2.

[107] See Joachim Kahlert, *Die Energiepolitik der DDR. Mängelverwaltung zwischen Kernkraft und Braunkohle* [*The energy policy of the GDR. Managing deficiencies between nuclear power and lignite*] (Bonn: Verlag Neue Gesellschaft, 1988).

[108] Emissionsbericht der DDR, 1988, Bundesarchiv, 7.

The large complication was the Chernobyl disaster in April 1986. Communist regimes traditionally, from the 1950s, perceived nuclear energy as a silver bullet in securing enough energy for economic development. Chernobyl changed that significantly, and plans on constructing large power plants became objects of harsh debates, such as two power plants in Poland, which provoked the emergence of a large environmental anti-nuclear movement and confrontation with the state-socialist regime.[109] Czechoslovakia and the GDR leaders did not face as strong anti-nuclear opposition as their Polish counterparts in the case of the "Ruch Wolnosc i Pokój" (Peace and Freedom Movement), or the wide and very active anti-nuclear movements in the Federal Republic of Germany, where Chernobyl catastrophe resonated a lot and gave birth to the large movement and the future Green party.[110] Anti-nuclear movements emerged in both countries after 1989, when the "Chernobyl effect" was fully manifested, for example, in the blockades of the completion of the Temelín nuclear power plant.[111]

Despite the difficulties, state socialist policies continued to consider nuclear energy as an integral part of the solution to the civilizational dilemma between harming ecosystems and the health of the population by burning lignite coal and fulfilling the promise of improving living standards. Especially in the Czechoslovak case, the reliance on the vision of a country fuelled by nuclear energy was such deeply rooted, that even the nuclear accident did not disprove it, and communist leaders mentioned the "development of nuclear energy" among their main priorities. A few months before the Velvet Revolution in June 1989, František Poukar, a prominent architect of the Czechoslovak state socialist nuclear program and an engineer,

[109] To find more about impact of Chernobyl nuclear disaster in Poland here: Tomasz Borewicz, Kacper. Szulecki, and Janusz Waluszko, *The Chernobyl Effect: Antinuclear Protests and the Molding of Polish Democracy, 1986-1990* (New York, NY: Berghahn Books, 2022).

[110] Stephen Milder, *Greening Democracy: The Anti-Nuclear Movement and Political Environmentalism in West Germany and Beyond, 1968–1983* (Cambridge University Press, 2017), or Stephen G. Gross, Energy and power: Germany in the age of oil, atoms, and climate change (New York: Oxford University Press, 2023).

[111] Jan V. Beránek ed., *Proč je třeba zastavit JE Temelín: historie, fakta a souvislosti projektu jaderné elektrárny Temelín* [*Why the Temelín nuclear power plant must be stopped: history, facts and background of the Temelín nuclear power plant project*] (Brno: Hnutí Duha - Přátelé Země ČR, 1997).

delivered a speech advocating the importance of expanding nuclear energy. Meeting minutes indicate that Poukar emphasized:

> "…we still do not create the necessary economic pressure to reduce energy consumption in the production sphere. He identified the construction of nuclear power plants as a priority direction for the further development of our energy industry, which, according to him, should be built at lower costs with strict adherence to all safety rules."[112]

So, in the eyes of state socialist leaders, nuclear reactors were seen as a solution to their problems, even under the dark legacy of the Chernobyl disaster. They believed that significant sources of energy from uranium could fuel growing industry and enable state socialist economies to produce more goods for citizens. Nuclear power plants also fit into the political infrastructure of SED's and KSČ's dictatorships. As significant centralized sources with continuous energy output, atomic reactors required an entire army of experts, security apparatus, and centralized management — all of which both regimes had in abundance. It is no wonder that the rulers of highly centralized, top-down, planned, and managed socio-economic structures in the GDR and Czechoslovakia in the late 1980s saw energy sources such as nuclear power as a rescue. Therefore, the hope in nuclear energy cannot by seen just as a reason for blindness, but rather as a structural and political dependence on large, technocratic and infrastructural solutions such as nuclear reactors. The concept of the "nuclear silver bullet," as I call it, is crucial for understanding governance in the later stages of state socialist regimes in the GDR and the Czechoslovakia. Faced with an ecological crisis, they hoped mostly in technocratic expertise, investments in major infrastructure projects, and maintenance of

[112] KSČ. ÚV. *14. zasedání Ústředního výboru Komunistické strany Československa ve dnech 14. a 15. června 1989* [*14th Session of the Central Committee of the Communist Party of Czechoslovakia on 14 and 15 June 1989*] (Prague: Svoboda, 1989), 9.

existing socio-economic structures – the nuclear reactor is a technological infrastructure that embodies all that.

1.2.3. Emissions Went Down

If the Czechoslovak's and GDR's governments worked hard to develop policies and investments that would reduce pollution and transform the economy into a less demanding mode of operation, the obvious question arises: Were their efforts met with success? Czechoslovak annual sulphur dioxide emissions slightly decreased,[113] and according to a report on GDR's emissions, in the late 1980s, emission of sulphur dioxide went down:

> "Sulphur dioxide emissions fell by 350.8 kilotons (6.3 percent) to 5208.7 kilotons in 1988. The reasons are reduced fuel consumption due to mild weather conditions in all districts (with the exception of the Cottbus district for electrical energy production) and a calculation-related reduction in sulphur dioxide emissions from dust combustion."[114]

On the local level, authorities in GDR's district Rostock on the Baltic coast reported a short period of lower emission levels due to a change in the fuel – from oil to natural gas, and also because of using heat in the city of Greifswald from new nuclear power plant in Lubmin.[115] Also, installing filtration systems reduced pollution in some regions of Czechoslovakia and the GDR. However, the levels of pollution remained high for the rest of the decade and even to the second half of the 1990s.

[113] *Vývoj a stav životního prostředí v ČSSR*, 1989, Czech National Archive, 67.
[114] Emissionsbericht der DDR, 1988, Bundesarchiv, 6.
[115] *Zusammenfassung: Ergebnisse des Umweltschutzes 1981 bid 1985* [*Summary: Results of Environmental Protection 1981 bid 1985*], 1986, Bundesarchiv (Berlin), DK 5, sign. 2158, 17.

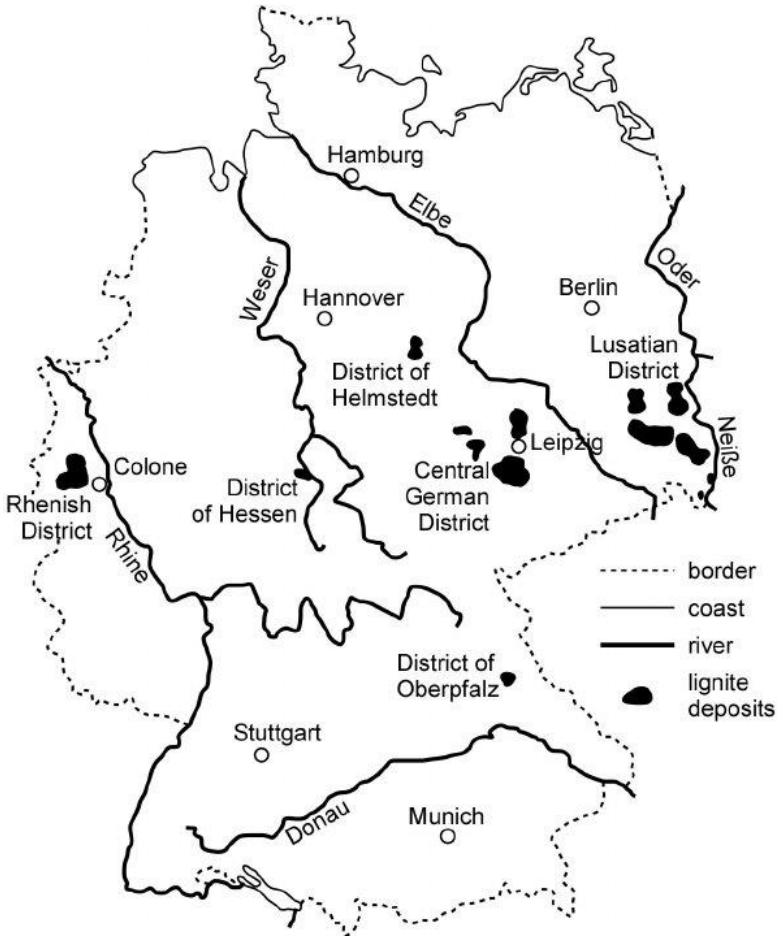


Figure 6 Location of German lignite mining districts. Martin Schultze, Walter Geller, Katrin Wendt-Potthoff, and Friedrich-Carl Benthaus, "Management of water quality in German pit lakes," ResearchGate, last modified June 3, 2024 https://www.researchgate.net/publication/228473136_Management_of_water_quality_in_German_pit_lakes.

During the state socialist era, governments invested heavily to reduce sulphur and nitrogen dioxide emissions: they installed filters in power plants, constructed new sources such as nuclear reactors and natural gas infrastructures, and implemented monitoring and warning systems. And partially because of the two seasons of mild weather during the winter, which reduced the demand for heat from coal power plants. However, it is not possible to consider their efforts as a general success. The reduction in emissions came too late, at a time when almost all of Erzgebirge and other regions were already experiencing high levels of emissions,

acid rains, and other ecological problems related to air pollution. In addition, the extensive growth of lignite mining in large cities in the north of Bohemia, as seen in the city of Most, had adverse effects. The southern districts of the GDR were similarly affected, with cities near mining areas and power plants, such as Halle, Leipzig, Dresden, and Chemnitz, suffering from polluted air. Despite the efforts made by the leaders of SED and KSČ, it was insufficient and tardy.

1.3. Future Past of Socialist Green Modernization

Throughout history, individuals whose actions have influenced past events have acted with certain expectations and beliefs about the outcomes of their actions. German historian Reinhart Koselleck briefly describes this in the sentence: "no expectation without experience, no experience without expectation," from the book *Vergangene Zukunft. Zur Semantik geschichtlicher Zeiten* (*Futures Past: On the Semantics of Historical Time*).[116] Historical experience, as stated by Koselleck, is not merely a recollection of the past but rather a product of the clash between an agent's envisioning of the future and the outcomes of their own and other agents' actions. Therefore, the motivations that drove the agents are crucial in understanding their aspirations and beliefs – in Koselleck's terms: "horizons of expectations". Without comprehending these expectations, it is impossible to describe the experience. Or put it differently: without describing the former imagination of the past – past futures, it is impossible to understand the steps of historical agents. I would like to show that ecological policies in the GDR and Czechoslovakia are actions that cannot be understood without consideration of the "past futures" of communist authorities.

[116] In original: *"Keine Erwartung ohne Erfahrung, keine Erfahrung ohne Erwartung."* Reinhart Koselleck, *Vergangene Zukunft: zur Semantik geschichtlicher Zeiten* [*Futures Past: On the Semantics of Historical Times*] (Frankfurt am Main: Suhrkamp, 1992), 352.

1.3.1. GDR's Circular Socialism

In September 1985, under Minister Reichelt, the Ministry for Environment and Water Management prepared a plan outlining environmental protection measures leading up to the year 2000. The ministry aimed to reduce material demand while ensuring dynamic economic growth. The plan emphasized the need for the economy to grow independently from material demand, thereby reducing the negative impact on the natural environment. The report claimed that:

> "In the 1990s, efforts to keep the air clean will become an integral part of the rational use of energy and the reduction of energy consumption as the main way to reduce emissions and ensure a high raw material economy, as well as to reduce and avoid environmental pollution and to protect forests."[117]

To achieve this, the plan focused on implementing new pollution filtration systems and advancing technological innovations, plan notably mentioned developing fabric filters resistant to hot air. The report mentioned international commitments of the GDR to reduce sulphur dioxide by 30 percent until 1993, compared to 1980 and also noted that achieving a reduction of half of sulphur emissions by the end of the century requires that all large power plants, as well as cogeneration and heating plants of larger output, be equipped with desulphurization processes with a separation efficiency of over 85 percent. Such pollutant separators' efficiency was ambitious compared to the primary way of reducing emissions by the limestone additive process, which had an efficiency of around 40 percent. However, architects of GDR's ecological policies mentioned the necessary steps toward clean air:

> "Use of energy sources with low environmental impact, especially:
>
> - Development of geothermal energy
>
> - Expansion of nuclear energy

[117] Vorschläge zur Entwicklung des Umweltschutzes in der DDR bis zum Jahre 2000 [Suggestions about Development of Environment Protection in the GDR until 2000], Bundesarchiv (Berlin), DK 5, sign. 1824, 15.

- use of alternative energy sources, especially biogas and renewable energy sources."[118]

The ministry's apparatus talked directly about alternatives to fossil fuels—domestic lignite coal, natural gas, and crude oil from abroad, mainly from the Soviet Union. The phase-out of these fossil fuels was also part of the ministry's much broader endeavour to develop GDR's economy as a "materially closed circle" in which all resources, raw materials, products, and trash could be recycled and reused. Basically, state socialist experts in the MUW wanted to establish a circular economy.

> "The development in the 1990s will be characterized by the fact that the boundaries between raw materials, waste products, and secondary raw materials will increasingly disappear. In the same way, efforts to achieve high material utilization will be combined with improving environmental conditions and protecting the environment through low-waste and no-waste technologies and closed material cycles."[119]

The state-socialist decision-makers had a clear vision in the 1970s and 1980s. They aimed to continue existing policies and introduce new concepts such as a circular economy and a shift towards non-fossil energy sources. By the end of the millennium, the GDR planned to reduce sulphur dioxide emissions by 50 percent, utilize resources in a cyclical, rational, and effective manner, develop new energy sources, restore forests in heavily degraded areas like Erzgebirge, and establish new national parks in biodiversity-rich regions like Rujana on the Baltic coast of Northern GDR. Even in the late 1980s, experts and Minister Reichelt kept this vision in mind. Despite falling short of their 1988 emissions reduction targets, which, as they reported: "was not fully achieved,"[120] they proposed new plans for significant investment actions totalling 500 million East German Marks, and in planning, they followed previous "horizons of

[118] Vorschläge zur Entwicklung des Umweltschutzes in der DDR bis zum Jahre 2000, 1985, Bundesarchiv, 13.
[119] Vorschläge zur Entwicklung des Umweltschutzes in der DDR bis zum Jahre 2000, 1985, Bundesarchiv, 13.
[120] Emissionsbericht der DDR, 1988, Bundesarchiv, 7.

expectations," that near 2000 East Germany would reduce emissions significantly and start to fuel rationally run economy by "highly effective" sources such as natural gas and nuclear.

1.3.2. Completely Re-Build Economy of Czechoslovakia

In the mid-1980s, Czechoslovakian communists, like their counterparts in the GDR, attempted to outline their expectations for the state of the environment and ecological policies. A group of members from the Central Committee of the Czechoslovak Communist Party (KSČ) led by Lubomír Štrougal proposed a document in 1985 titled: "Zásady státní koncepce tvorby a ochrany životního prostředí a racionálního využívání přírodních zdrojů" ("Principles of State Conception of Creating and Protecting Environment and Rational Use of Resources").[121] The document's purpose was to address the country's deteriorating ecological problems and integrate ecological policies into the decision-making and economic planning processes. At the outset of the conception, the authors described the existing situation:

> "Over the past 15 years, the level of care for the environment has become one of the determining factors in the growth of living standards and, in some areas, one of the limiting factors in the development of productive forces. Due to its economic and social effects, this issue significantly impacts public opinion within the population and is increasingly applied in international relations."[122]

Štrougal's group calculated the importance of "caring for the environment" regarding investments. According to them, the required amount of money for "ecological investments" during the 8th five-year plan was 17, 5 billion Czechoslovak crowns, and the budget needed to stop the growing ecological damage completely was estimated at 40 billion crowns. This was in comparison to the annual federal budget of Czechoslovakia, which was over 200 billion

[121] *Zásady státní koncepce tvorby a ochrany životního prostředí a racionálního využívání přírodních zdrojů* [*Principles of State Conception of Creating and Protecting Environment and Rational Use of Resources*], 1985, Czech National Archive, KSČ - Ústřední výbor 1945-1989, item 154.

[122] *Zásady státní koncepce tvorby a ochrany životního prostředí a racionálního využívání přírodních zdrojů*, 1985, Czech National Archive, 1.

crowns in 1986.[123] The proposed principles suggested investing this money in a wide range of policies to solve the country's ecological crisis and restore the environment's state to the same condition as at the turn of the 1960s and 1970s. Regarding this effort, principles noted that:

> "…achieving environmental quality at the level of the late 1960s and early 1970s in the time horizon around 2000, following the expansion of production, assembly, and construction capacities, will require an additional investment of about 60 billion Czechoslovak crowns for the own production and construction of environmental protection equipment."[124]

Štrougal and his comrades presented a significant investment plan for ecological transformation at the internal party forum. This plan aimed to address air pollution and improve living standards by using "own" technologies and instruments within the federal budget. What were the primary objectives of the ecological policies concerning air pollution? Additionally, what did Štrougal propose the main instruments to achieve a better living environment and surpass the limits on the population's living standards imposed by ecological degradation in the 1980s?

Štrougal proposed Principles with the main goal to decrease total emissions of sulphur and nitrogen dioxides, as well as dust emissions and their trans-border transfers. The goal was to achieve air quality comparable to the situation in the 1960s and 1970s.[125] This involved installing hundreds of filtration systems in almost all coal power plants, as well as in smaller and medium-sized heating plants and factories where coal, coke, or other fossil fuels and potentially harmful substances were used. The document also outlined the gradual transformation of all power and energy sectors through electrification and gasification. It was

[123] *Zákon č. 114/1985 Sb. o státním rozpočtu československé federace na rok 1986* [*Act No. 114/1985 Coll. on the State Budget of the Czechoslovak Federation for 1986*] in "Zákony pro lidi.cz," AION CS 2010–2024, last modified June 3, 2024, https://www.zakonyprolidi.cz/cs/1985-114.

[124] *Zásady státní koncepce tvorby a ochrany životního prostředí a racionálního využívání přírodních zdrojů*, 1985, Czech National Archive, 1.

[125] *Zásady státní koncepce tvorby a ochrany životního prostředí a racionálního využívání přírodních zdrojů*, 1985, Czech National Archive, 9.

proposed that households and businesses in Czechoslovakia be powered by central heating systems and electricity from large sources such as natural gas and nuclear power plants. The plan was to "clean" coal using pollutant separators and increase power plant components' efficiency through "innovative" coal-burning methods in the short and medium term. In the longer term, the goal was to replace coal with less environmentally demanding sources. One of the main measures mentioned by the Principles was:

> "Prepare and develop a long-term program of restructuring the national economy to a less energy-intensive model, including the gradual implementation of the nuclear program as one way to replace fossil fuels and decrease emissions in the affected areas."[126]

The Czechoslovak communists around Štrougal aimed to rebuild the national economy to address ecological problems. They planned to use large-scale technological solutions such as nuclear energy and develop centralized energetic infrastructures, and by that elevate the existing state socialism in Czechoslovakia to something as a higher level of civilization, which can ensure economic growth with increasing living standards, and utilize resources and energy in a way that allows ecosystems and natural actors to thrive without risk of exhaustion. The Communist Party envisioned Czechoslovakia in the 2000s as a green state socialism with a highly effective economy without significant negative influence on the "environment". This modernized economy would satisfy the energy needs of production processes and households through centralized power plants and other infrastructures while ensuring the health of nature and citizens.

Nonetheless, Štrougal's horizons of expectations was rejected by the conservative fraction in the Central Committee. Conservative members did not allow Štrougal to implement "Principles of State Conception of Creating and Protecting Environment and Rational Use of

[126] *Zásady státní koncepce tvorby a ochrany životního prostředí a racionálního využívání přírodních zdrojů*, 1985, Czech National Archive, 10.

Resources" to the party's political line. Thus efforts for more active ecological policies went on the back burner for more than four years – measures on desulphurization had fewer investments as well as other policies. On the very close of state socialism in Czechoslovakia, in October 1989, Štrougal and his comrades successfully revived the attempt to develop and introduce more progressive and active ecological policies to the main party political line from the half of the decade. They gathered members of the Central Committee and successfully gained support for their plans on "ecological investments" and called it a broadly green transformation of state socialism.

1.3.3. The Limits of Structure and Limits of Time?

Just a few weeks before the 17th of November, the symbolical beginning of an event broadly known as the Velvet Revolution, the Central Committee KSČ gathered to discuss *Politics of the Communist Party of Czechoslovakia in the Creation and Protection of the Environment.* In the debate, local party officials reported on struggling with the following central program of ecological modernization. The party member Václav Čermák from the north bohemian city Chomutov, which was and still is one of the centres of the coal mining and energy industry, complained that "it is difficult to fulfil economic and ecological tasks simultaneously."[127] He pointed out that pollutant separators for sulphurous emissions are the single way to continue using coal power plants and warned that the delayed onset of nuclear power plants impedes the decrease of lignite usage. A similar case was with the coal power plant near Mělník. Justina Radimská, a member of the Mělník District National Committee, mentioned that despite intensive endeavour and investment, the Mělník power plant still emitted 270-300 tons of sulphurous emissions per day.[128] At the end of the gathering, the

[127] KSČ. ÚV. *15. zasedání Ústředního výboru Komunistické strany Československa ve dnech 11. a 12. října 1989* [*15th Session of the Central Committee of the Communist Party of Czechoslovakia on 11 and 12 October 1989*] (Prague: Svoboda, 1989), 7.

[128] KSČ. ÚV. *15. zasedání Ústředního výboru Komunistické strany Československa ve dnech 11. a 12. října 1989*, 9.

member of the Central Committee Ivan Knotek gave the summarising speech in which he clearly claimed:

> "It is well known how difficult problems our society had to deal with after 1948. We openly say that without the development of heavy industry, chemistry, and socialist agricultural production, we would not have reached our present economic and living standards and would not have been able to secure the state's defence. In terms of today's knowledge, however, we realize that the environmental effects of the extensive development of the national economy have not been eliminated in time and to a sufficient extent."[129]

Besides this, Knotek also admitted the catastrophic state of public health, increasing numbers of respiratory diseases, failure to meet commitments in the ecological investment, pollution of water, damage of large areas of landscape, forests, and natural ecosystems, and however the levels of pollution decreased slightly after the mid of 1980s, the levels of air pollution were still high and dangerous for the population. After Knotek's speech, the committee unanimously voted for a proclamation, which was a commitment to "not allow future decline of the environment in the 9th five-year plan and continuously reach fundamental improvement of the quality of the environment until 2000."[130] At the end of the central committee meeting, first secretary Miloš Jakeš expressed satisfaction with the results of the committee gathering and said that "it will positively affect annual member meetings and preparation of the next party convention in the aggressive struggle for the consciousness of the nation and in next advancement of the party."[131] After the applause, the meeting ended. Just one and a half months later, the communist government imploded.

[129] KSČ. ÚV. *15. zasedání Ústředního výboru Komunistické strany Československa ve dnech 11. a 12. října 1989*, 34.
[130] KSČ. ÚV. *15. zasedání Ústředního výboru Komunistické strany Československa ve dnech 11. a 12. října 1989*, 52.
[131] KSČ. ÚV. *15. zasedání Ústředního výboru Komunistické strany Československa ve dnech 11. a 12. října 1989*, 60.

Throughout the 1980s, communist regimes in East Germany and Czechoslovakia implemented various policies to address industrial air pollution. They focused on using technological innovations, centralizing infrastructure systems, and increasing effectiveness. The peak of efforts to develop ecological policies was around the mid-1980s. However, after that, the socialist regimes in both countries faced political and economic limitations. Some members of the communist party in the GDR, such as Honecker, and conservative members of the Central Committee in Czechoslovakia were sceptical of the efforts made by their technocratic comrades, such as Hans Reichelt and Lubomír Štrougal.

The political interests of leading groups within the parties partly hindered the green modernization of state socialism in the GDR and Czechoslovakia. Moreover, economic performance, technological capacities, and limited horizons of political ecology also played a significant role in restricting these efforts. Communist regimes believed in the bright future secured by large construction projects, introducing new "outcomes of techno-scientific progress" into the production process, which would bring economic growth measured by the number of manufactured cars, fridges, televisions, or tonnes of steel, chemicals, or produced grain, meat, and hectolitres of milk. The *web of life* was considered just as a resource basis of the mode of economic growth described above, and according to leaders of state socialism, the sources of the *web of life* can be used freely at the moment when technologies will reduce harm to the health of the population and ecosystems. In the imagination of the future, this exploitation of "free gifts" will continue and will be harmonized by using tech- and more efficient ways of economic production. In the eyes of Štrougal and Reichelt, there were no limits that can be kept uncrossed – you need just more filtration systems, nuclear reactors, an effective system of recycling and reusing rubbish, and an "ecologically aware population".

As I demonstrated, emissions of the main air pollutants decreased towards the end of the state socialist regime. However, rather than being a success, this was an example of the

unfortunate situation when the leaders of SED and KSČ continuously attempted to increase and speed up investments in developing new ecological policies. They allocated a relatively large amount of finances and resources to these efforts, but it was too late and achieved little success.

Tobias Huff and Miroslav Vaněk similarly claim that, during the GDR and Czechoslovakia regimes, insufficient amounts of money were allocated to the efforts for solving "ecological problems," so according to them, the late introduction of such policies and their little success was just a matter of lack of capacities.[132] I think that this conclusion is not enough. The failure of state socialist regimes in the GDR and Czechoslovakia came firstly from the structural limits of the state socialist industrial modernity, which was historically dependent on fossil fuel sources and intensive industry to feed growing material consumption by more and more goods. Secondly, the story about ecological problems tells a lot about the paradoxical weakness of the state socialist regimes. Regime leaders were aware of the environmental conditions and the need for significant socio-economic changes to prevent ecological disasters and ecosystem collapse. However, they were reluctant to exert their power to implement substantial transformations. Instead, they devised a series of technocratic policies aimed at reducing pollution levels, but these policies were implemented too late, and the planned reduction was not sufficient. Third, the reason was the Cold War configuration of the international order, where East and Central European countries ran a race with their Western counterparts, but contrary to France, Great Britain, Federal Republic Germany, and other industrialized countries, the eastern bloc had fewer options in outsourcing the negative impact of industrial modernity.

[132] See Huff, *Natur und Industrie im Sozialismus: eine Umweltgeschichte der DDR*, and Vaněk, *Nedalo se tady dýchat*.

1.4. Conclusions

Facing the threat of critical degradation of ecosystems with a crucial role in the reproduction process of the *web of life*, state socialist regimes in Czechoslovakia and East Germany launched "green modernization." By developing and introducing a variety of policies focused on decreasing emissions of sulphur, nitrogen dioxide, and other pollutants, state socialist leaders tried to solve the negative results of a growing economy and promises of the rulers from the SED and KSČ to the population of East Germany and Czechoslovakia about continually improving standards of living. As I described in this chapter, leading members of the regimes and their expert apparatuses were well aware of the extent of the threat – they had all the needed numbers. They considered monitoring the threat as a serious issue into which it is wise to put money. Measures to reduce pollution and other ecological policies were no exception. Throughout the 1980s, it is possible to see that communist leaders considered "ecological problems" as serious, and they ordered to invest in ecological policies, charge polluters, introduce new norms, install expensive filtration systems, or create entirely new methods of addressing pollution such as limestone addition or nuclear energetics. Growing ecological awareness among the population, pressure from members of the communist apparatus and experts, and international agreements to reduce air pollution all contributed to the push for green modernization in Czechoslovakia and East Germany during the late Cold War period. At the end of state socialism in Central Europe, key regime figures believed it was possible to balance increasing material production and consumption with a healthy and stable ecosystem and society. Moreover, they believed accelerating economic growth and modernization was the only way to ensure a bright future. However, this future did not come true.

The long-term planning of future political actions was a key characteristic of state socialist regimes and their centrally planned economies worldwide. Even after the collapse of

these regimes in central and southern Europe, communist leaders continued to envision progress. The top party leadership members envisioned a society without ecological problems, where socio-economic development driven by new scientific and technological progress would reconcile all the disparities of a developed socialist society. They viewed their regimes as being on a higher civilizational level compared to capitalist societies, which, according to Czechoslovak communists such as Štrougal or Knotek, had hidden structural defects that capitalism could not overcome. However, during the few years of "green modernization" policies, the communist rule systems in East Germany and Czechoslovakia could not muster sufficient financial and institutional capabilities to address their ecological problems effectively. This failure to take adequate action against the obvious and highly dangerous outcomes of the ecological crisis eroded public confidence. After the Peaceful Revolution in Germany and the Velvet Revolution in Czechoslovakia, new leaders committed to addressing the failures of state socialism. The idea of implementing policies of green modernization within state socialism promoted and developed by the leaders of the SED regime in East Germany and the KSČ regime in Czechoslovakia became a thing of the past – in Koselleck's words past future. The next chapter will delve into the politics of industrial air pollution during the collapse of state socialism and the foundation of democratic capitalist regimes in East Germany and the Czech lands.

2. POLITICS OF INDUSTRIAL AIR POLLUTION IN NEW REGIMES

„…we need a long-term program, to be implemented and re-examined from year to year, which should aim to bring economy and ecology more into harmony than before, whereby I would like to add that the GDR is not as bad in this area as it appeared to be - due to unnecessary classification of information. In the future, no one should be allowed to cancel or delay planned environmental protection measures. What is urgently needed is a new energy concept that leads to a reduction in fossil fuels and energy consumption."[133]

Hans Modrow, Government Program Statement, November 17th, 1989

"Let us try to move away from ecologically devastating extensive economic development towards what is now described in the world as sustainable, oriented so that today's needs are not met at the expense of future generations and at the expense of nature. Therefore, it is essential to adopt measures of a systemic character in the short term. These include, in particular, an ecologically oriented restructuring of the economy, including technologies - technologies that are ecologically clean, save natural resources, are energy efficient, and do not pollute the environment with waste, as well as the elaboration of systems of local government and the rational distribution of state administration, consistent legislative protection, and a system of general environmental education."[134]

Petr Pithart, Government Program Statement, June 2nd 1990

[133] Hans Modrow, *Regierungserklärung am 17. 11. 1989* [*Government Declaration on 17 November 1989*], "Regierungserklärung am 17. 11. 1989" Glasnost - archiv, last modified May 24, 2024, http://www.glasnost.de/hist/ddr/89regerkl.html.

[134] Government of Petr Pithart, *Programové prohlášení vlády* [*Government Programme Statement*], "Vláda Petra Pitharta (29. 6. 1990 – 2. 7. 1992)," Vláda České republiky, last modified May 24, 2024, https://vlada.gov.cz/cz/clenove-vlady/historie-minulych-vlad/prehled-vlad-cr/1990-1992-csfr/petr-pithart/prehled-ministru-24626/.

On November 17, 1989, Hans Modrow, a prominent member of the SED and the new chairman of GDR's ministry council, introduced a program for his government. Modrow was known for supporting Gorbachev's perestroika policies and was considered a potential successor to Erich Honecker within the party. During the autumn demonstrations, along with the mayor of Dresden, Modrow initially ordered the police and Stasi to crack down on protesters. However, he later engaged in negotiations with opposition leaders and led the country to the first free elections in March 1990. Modrow proclaimed that his government wanted to restart national production growth and stabilize the economy and said: "Only an economically strong state can achieve ecological progress."[135] The collapse of ecosystems and other consequent harm that come from the catastrophic state of the living environment was one of the main challenges of Modrow's government, and the public expected fast improvement. In the speech, Modrow gave a clear answer: reduce the use of fossil fuels and accelerate the modernization and growth of GDR's economy.

Just a few hours after Modrow's speech in Berlin's Palast der Republik (Palace of the Republic), a large procession of demonstrators stood in front of the riot units in the middle of Prague, the main city of Czechoslovakia. The brutal crackdown on the officially approved demonstration organized by student unions started the fall of the state socialist regime of the Communist Party of Czechoslovakia. After a few days, a protest movement led by the newly founded Občanské fórum (Civic forum, OF) held demonstrations attended by hundreds of thousands of people and launched a general strike ten days after the police violence on 17th of November, and a delegation of Občanské forum led by dissident and philosopher Václav Havel entered negotiations with the Czechoslovak federal government of prime minister Ladislav Adamec.[136] Under the pressure of the mass protest movement, the state socialist regime in

[135] Hans Modrow, Glasnost – archive, "Regierungserklärung am 17. 11. 1989."

[136] To find more about the details of political turning point of November 1989, see Jiří Suk, *Labyrintem revoluce: aktéři, zápletky a křižovatky jedné politické krize: (od listopadu 1989 do června 1990)* [*Through the*

Czechoslovakia imploded. After a few weeks, Czechoslovakia had a new government with ministers from the Občanské forum led by reformist KSČ member Marian Čalfa. At the end of the year, the Federal Assembly elected Václav Havel as the president of Czechoslovakia. The process of transforming state socialist regimes in Czechoslovakia and the GDR has begun.

In this chapter, I examine governmental programs and policies related to industrial air pollution during the early 1990s. The first part of the chapter discusses changes in government structure in both countries in relation to ecological policies. The second part analyses governmental programs and visions of economic changes related to energy and environmental policies. My main goal in this chapter is to describe the political ecology of new regimes in reunified Germany and Czech Lands—the former Czechoslovak socialist republic and the Czech Republic after the federation split. I contend that the political ecology of new post-socialist regimes has significant continuity with state socialism, with the exception of the short episode in the Czechoslovak case. Under the leading role of previous state socialist environmental experts such as Bedřich Moldan and Josef Vavroušek, which became prominent political figures, Czechoslovak governments attempted to establish a form of political ecology that considered economic growth's planetary and material limits. However, during the economic transformation, proponents of this model lost influence, and neoliberal ecological policies of modernization and support of the private sector prevailed. As a result, Czechoslovakia's ecological policies and also policies in reunified Germany were dominated by the concept of "green modernization." This approach addresses environmental issues by support of the introducing new technologies and by the promoting of the economic growth. New governments in free-market economies used instruments different from those of their state socialist ancestors. Still, on the level of the "green modernization", they maintained the

Labyrinth of Revolution: Actors, Plots and Crossroads of a Political Crisis: (November 1989 to June 1990)], (Prague: Prostor, 2009).

continuity with the pre-1989 regimes. From a comparative perspective, I aim to show varieties of what I call "green modernization" and describe such policies' political motivations and consequences. Through the chapter, I argue that despite significant political transformation and structural changes in the socio-economic model, the political ecology of democratic capitalism shares fundamental principles with state socialism.

2.1. New People and New Institutions

During the 1989 revolutions, the broadening of "horizons of expectations," which started in the 1980s, peaked, and everything became possible for revolution leaders and the general public. With public support, new people came to power and started actively participating in creating new political, social, economic, and ecological orders. In this part, I want to provide insights into the process of laying the foundation of new post-socialist regimes and trace continuity and changes in the field of ecological policies.

2.1.1. Continuity of Czechoslovak Technocracy

Czechoslovak state socialism imploded in very few days after police violence in Prague and surprised revolution leaders around the Občanské forum had to seize power.[137] Občanské forum nominated an environmental expert, Bedřich Moldan, from the Czechoslovak Academy of Science to the Czech national government led by communist František Pitra. Moldan's task was to prepare the foundation of the first Czech minister for the environment and begin with the recovery of devastated ecosystems. The Ministry of Environment did not exist at the time of Moldan's appointment, but previous communists such as Miroslav Knotek and other members of the Central Committee, which cared for the development of ecological policies,

[137] The best description of the surprise of easily taking power from the communists is found in the memory book by the dissident and former Czech Prime Minister Petr Pithart: Petr Pithart, *Devětaosmdesátý: vzpomínky a přemýšlení: krédo* [*Eighty-nine: memories and reflections: a credo*] (Praha: Academia, 2009).

continuously talked about the need for a Ministry of Environment, as did expert advisors.[138] Despite that, Moldan had to create a ministry on his own. Moldan was one of the leading architects of strategies for reducing pollution and improving the living environment in post-revolutionary Czechoslovakia, and Moldan was widely praised, alongside Czech Prime Minister Petr Pithart from OF (Figure 7), for introducing limits on coal mining and several crucial legal norms on environmental protection and the "ecologization" of energetics.

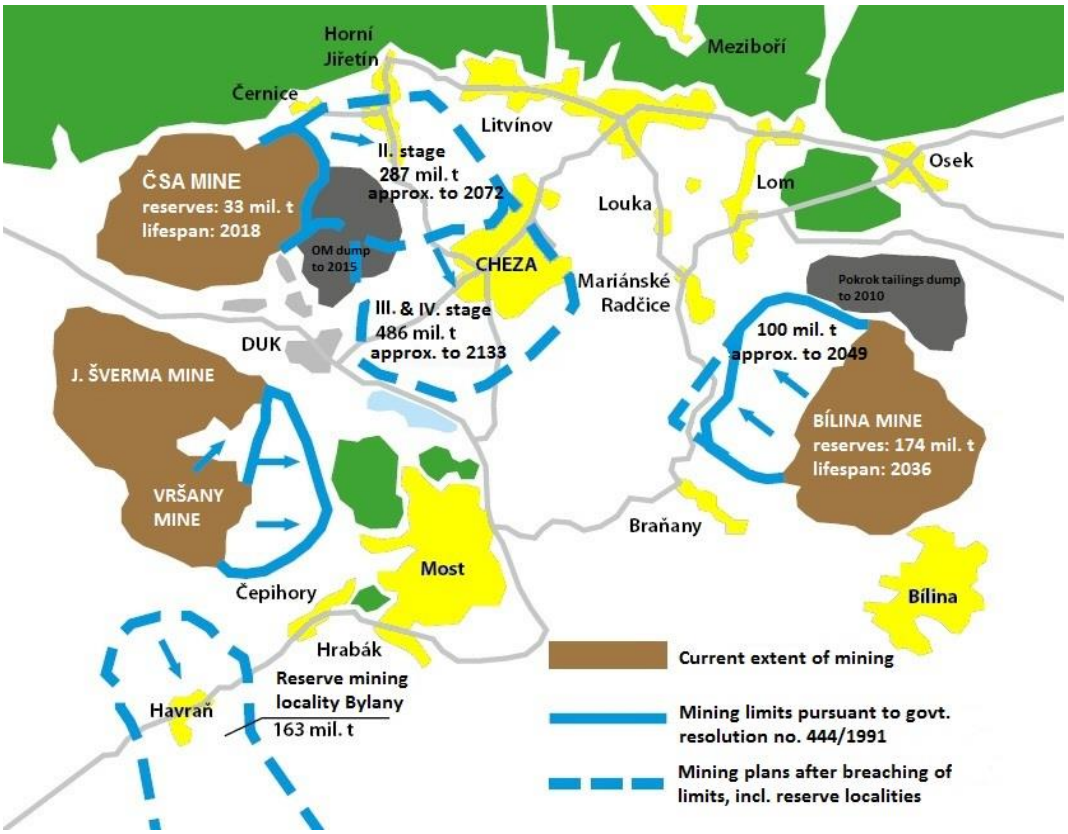


Figure 7 Territorial mining limits in North Bohemia. Andrew Barton, Charles University Environment Centre, 2012. "Territorial mining limits in North Bohemia," Wikipedia Commons, last modified June 3, 2024, https://commons.wikimedia.org/wiki/File:North_Bohemian_mining_limits.jpg.

Moldan was not new in the field, and his career in the ecological policies and environmental expert circles had started decades before the revolution. Moldan co-authored

[138] Vaněk, *Nedalo se tady dýchat*, 192.

the document "Analysis of the Ecological Situation" with a team led by Czech biologist Emil Hadač in 1983. This analysis was ordered by the technocratic and pro-perestroika communist Prime Minister Lubomír Štrougal, and as such, the analysis came from clear positions:

> "…only the path of Marxist knowledge of the indivisible relationship between economic and biological reproductive processes allows for a fundamental change in the conception of this socio-economic development, its fundamental rationalization and intensification, the reduction of energy and raw material intensity and the maximization of the capture and use of waste of all kinds, but also a fundamental change in the ideas about the goals of social development, the ideas that the growth of consumerism at the cost of a devastated environment and a devastated landscape is the growth of the standard of living and the goal of the development of socialist society."[139]

Just ten years later, Moldan, from the position of the minister for environment, presented an official strategy conception of his ministry, which he called the Duhový program (Rainbow program). In the foreword, Moldan claimed:

> "Modern society has recognized that market forces and their free operation are the basis of a healthy economy; however, they need to be effectively defined through laws. These laws must establish the rules and limits of the functioning of the market mechanism in such a way that one of the basic human rights, the right to a healthy environment."[140]

There is a ten-year gap between two quotations of texts that Moldan was a co-author of. He transitioned from a Marxian position, which presumed that "socialist countries" are more suitable for generating environmentally friendly economic growth, towards the position of a

[139] Hadač ed., "Rozbor ekologické situace ČSSR," 564.

[140] Bedřich Moldan, *Duhový program: program ozdravení životního prostředí České republiky* [*The Rainbow Programme: Programme for the Environmental Recovery of the Czech Republic*] (Prague: Academia, 1991), 8.

"market-mechanisms" advocate who claims that environmental protection is about setting rules and limitations and then letting market mechanisms work.[141]

However, Moldan was not a neoliberal. Moldan's conception of ecological policies had been highly influenced by the international debate about the limits to growth, which started with the publication of the Club of Rome. The basic assumption was that economic growth has strong material, energy, ecosystem, and planetary boundaries, and to cross these boundaries can be dangerous for the modern human society on the planet.[142] However, the Club of Rome did not suggest abandoning economic growth itself. Instead, the authors associated with the club and inspired by the concepts in "Limits to Growth" contributed to the discourse that gave rise to the idea of sustainable development.

As such, Moldan did not believe in the self-acting power of the free market, but he tended to set up limitations, legal norms, and regulations to create a "sustainable economic model" that would harmonize the needs and possibilities to improve the life of "human civilization" on the one hand, and sustain "nature" on other. Before 1989, Moldan was a member of the technocratic milieu that emerged under the normalization regime in the 1970s and 1980s, where expertise and technocratic reason became one of the main sources of legitimacy for political decisions.[143] From the same milieu of experts and technocrats came also Václav Klaus, later post-socialist prime minister of the Czech Republic and one of the architects of privatization and economic transformation in the 1990s. After Moldan's recall from the ministry, after later refuting suspicions of collaboration with the secret police, Moldan entered Občanská demokratická strana (Civic Democratic Party, ODS), whose leader was Klaus. Although the assumptions of Klaus and Moldan were diverse on many levels, they shared the same notion

[141] More in Bedřich Moldan, and Vladimír Jiránek, *Ekologie, demokracie, trh* [*Ecology, democracy, market*] (Prague: Ministery of Environment, 1992).

[142] Donella Meadows et al, *The Limits to Growth: A Report for the Club of Rome's Project on the Predicament of Mankind* (New York: Universe Books, 1972).

[143] See Kopeček, et al., *Architekti dlouhé změny: expertní kořeny postsocialismu v Československu*.

of politics, which was oriented on technocratic measures and top-down reforms combined with the free operations of more or less private subjects.

On the level of ecological policies, Moldan's efforts went on many levels alongside the course developed by the state socialist reformers. For instance, Moldan continued a large control action of the People's Control Committee ordered in 1987, which aimed to map and summarize the pollution level completely and indicate the main polluters in the whole of Czechoslovakia to have data for designing new ecological policies and also the 9th five-year plan. [144] Czechoslovak communists wanted to force polluters to reduce emissions by introducing norms, ordering controls and fees, and fines for exceeding pollution limits. Nonetheless, state socialist elites knew that such restrictions could slow down the production process and negatively impact the economy. Moldan and the new government had different positions. Through market reforms and partial privatization of the Czechoslovak energy system, the possibilities of the government have changed. Moldan's ministry prepared more strict limits on emissions and suggested harsh controls and restrictions.[145] The law on state protection of air quality posed significantly higher fees and fines for pollution emissions, and according to the law proposed by Moldan, this restriction came gradually into force between 1992 and 1997.

Moldan's peak efforts to reduce emissions through restrictive ecological policies culminated in the imposition of limits on lignite mining in Northern Bohemia. These limits were established by a legally binding resolution of the Czech national government under Petr Pithart in October 1991 and consist of the predictable limitations of possibilities for mining in

[144] *Usnesení Výboru lidové kontroly ČSSR ze dne 22. Prosince 1987* [*Resolution of the People's Control Committee of the Czechoslovak People's Republic dated 22 December 1987*]. Czech National Archive, Prague, People's Control Committee, item 7.

[145] *Návrh zákona o ochraně ovzduší a návrh zákona ČNR o státní správě ochrany ovzduší* [*Draft Air Protection Act and Draft Czech National Council Act on State Administration of Air Protection*]. Czech National Archive, Prague, Ministery of Environment, item 36.

the area so mining companies can plan their operation and gradually reduce production.[146] This measure protected several settlements from mining and saved thousands of tons of emissions that would have been produced if the mined lignite had been burned in power plants. Limits for mining were a clear example of Moldan's approach to ecological policies: create a predictable environment for the market actors, which can, step by step, lead to a more "sustainable model of the economy," which was intellectually connected with the notion of limits to growth. However

Besides Moldan, Josef Vavroušek, a member of the federal Czechoslovak government and one of the prominent dissidents before 1989, was involved in a wide range of activities related to creating new ecological policies. Vavroušek prepared the Conception of the state ecological policy, which defined the state's main role regarding ecological issues in the new regime.

> "The role of the state is therefore to be - or at least should also guarantee - the improvement of the quality of the environment. They must create such conceptual, legislative, economic, institutional, informational, social and other conditions in society that will stimulate care for the environment and at the same time penalize those who disturb the environment."[147]

The basic consensus among the first generation of politicians who created ecological policies was the presumption that the new regime would be able to solve immediate ecological problems by designing a legal framework and ensuring suitable "conditions" for the "decolonization" of the economy.

Moldan's successor in office, the environmentalist and dissident Ivan Dejmal, continued these policies of designing legal frameworks. After the second free election in 1992, Pithart's

[146] *Usnesení vlády ČR ze dne 30. října 1991 č. 444.* [*Resolution of the Government of the Czech Republic of 30 October 1991 No. 444*.] "Dokumenty vlády", kormoran.vlada.cz, last modified June 3, https://kormoran.vlada.cz/usneseni/usneseni_webtest.nsf/0/7DCED4838DD30F36C12571B6006B9ABD.

[147] Josef Vavroušek ed., *Návrh zásad státní ekologické politiky*, 3.

party, Občanské hnutí, built on the remnants of the Občanské forum from the separated Civic Democratic Party led by Václav Klaus, lost positions. As a result, Pithart's government was replaced by the first Klaus cabinet, and the foundation period of the post-revolutionary ecological policies ended. With Ivan Dejmal, Moldan laid the foundations of ecological policies within the new regime. However, the period between 1990 and 1992 was in some way an exception: no Czech government has been as active in ecological policy as Pithart's government, and imposing new limits on mining fossil fuels, more strict regulations, and active energetic and ecological policies were out of the mind of Czech governments for next decades. These exceptional phases were, at some point, a shared phenomenon among the Central European countries during the revolutionary changes of 1989.

2.1.2. Green Roundtable

One of the main impulses for the fast implosion of GDR's state socialist regimes was a series of demonstrations during the autumn of 1989, which usually took place on Mondays. Historian Dieter Rink summarized that "the relevant demands at the Monday demonstrations included the disclosure of environmental data, phasing out the use of nuclear power, reducing air and water pollution, and stopping the destruction of the landscape by lignite mining," which gave the East German protest a robust environmental dimension.[148] With the inauguration of the new reformist Modrow's government, the ecological policies and efforts to reduce air pollution and other "ecological problems" became a priority. In December 1989, Modrow's government organized a "green roundtable" with the representatives of the opposition. The institution of roundtables served as a space for negotiating between the government and the opposition leaders and led to the co-optation of the ministers to the government by Modrow in

[148] Dieter Rink, "Umwelt," Bundeszentralle für politische Bildung, last modified June 3, 2024, https://www.bpb.de/themen/deutsche-einheit/lange-wege-der-deutschen-einheit/47350/umwelt/#node-content-title-3.

February 1990. MUW, led by Hans Reichelt and after his resignation by new minister Peter Diederich, both communist functionaries before 1989, came with a report about the situation of the environment in February 1990, which came with severe conclusions:

> "The environmental conditions in the GDR are characterized by extremely high levels of air, water, and soil pollution. They are associated with health hazards for people and a considerable burden on the national and global ecosystem."[149]

A fast decision was needed. The Green Roundtable and Modrow's government aimed to bring such a decision. Their negotiations about future ecological policies had three main outcomes. The government stopped the developing nuclear energy program and prepared to put out of operation four reactors of a nuclear power plant in Greifswald and to end the construction of four reactors of a nuclear power plant operation and new reactors in Stendal. Secondly, Modrow's government decided to proclaim several new national parks after the pressure of the civic movement, and 10 percent of GDR's territory was under nature protection. The last decision addressed the issue of industrial air pollution by decreasing energy production and shutting down most pollutant power plants.[150] The GDR began by remediating highly polluted areas and addressing ecological burdens caused by the industry's intense exploitation of fossil fuels, chemicals, and natural resources. The solution seen on the roundtables was to increase renewable energy sources and decentralize energetic infrastructure.[151] The call for policies on the development of renewable energy resources is especially exceptional – in the Federal Republic of Germany, the sources of electricity from wind were rare, and also, the technologies in solar and other renewable energies were not in the advanced stage of technological development.[152] Suggestions about renewables development, in combination

[149] *Konzeption für die Entwicklung der Umweltpolitik* [*Concept for the development of environmental policy*], 1990, Bundesarchiv (Berlin), Ministerrat der DDR, DC 20-I/3, sign 2929a.

[150] Helmut Herles, and Edmunt Rose, eds., *Vom Runden Tisch zum Parlament* (Bonn: Bouvier, 1990), 92.

[151] Dieter Rink, "Umwelt," Bundeszentralle für politische Bildung.

[152] More about beginnings of renewable sources in Federal Republic Germany in: Stephen Milder, "From Tinkerers to Consultants: Individual Engagement, Reunification and the Making of Germany's Renewable Energy Sector," *Global Environment* 17, no. 1 (2024): 15-46.

with decentralization, represented a completely different approach to the design of energy systems compared to the highly centralized, fossil fuel, and nuclear energy-based systems.

However, Modrow's party, PDS, the successor of SED, lost elections in March 1990, and in April, Modrow was replaced by the new coalition government of Lothar de Maizière. In the Government Program Proclamation, Lothar de Maizière clearly stated that:

> "The economic policy goal of the coalition government involves converting the previous state-controlled command economy into an ecologically oriented social market economy."[153]

The new GDR government believed more in pro-market reforms than in direct interventions to the energetic system and state of ecology. In their eyes, the ecological devastation was caused by a state-controlled economy rather than intensive industrial modernity itself. At this point, significant and very important fiction came into play: western democratic capitalist regimes are more effective in harmonizing the needs of the economy and the needs of "nature," and from this presumption, only the market economy can protect the environment. These post-socialist neoliberal approaches to the ecological policies ignored the fact that the devastation of forests reached approximately comparable extent in both Germanys in the 1980s and that Ruhr valley was, at some point in time, seemingly devastated by the air pollution as the Leipzig/Halle area or Dresden. According to historians Gunther Heydemann and Detlev Brunner, this fiction was spread by the Christion Democratic Union and by the West German government of Helmuth Kohl, and also his ministers of environment Klaus Töpfer, who was a minister in third Kohl's cabinet and also Angela Merkel who was a member of last, fifth Kohl's government. Their aim was to present policies in "old" federal states as

[153] Lothar de Maizière´s Government Program Proclamation quoted from Volker Gransow, and Konrad Jarausch, ed., *Die Deutsche Vereinigung: Dokumente zu Bürgerbewegung, Annäherung und Beitritt* [*German Reunification: Documents on the Citizens' Movement, Rapprochement, and Accession*] (Cologne: Verlag Wissenschaft und Politik, 1991), 157-59.

model cases for "new" states of the former GDR.[154] Thus, de Maizière's government just heralded Kohl's government's ecological policies after the reunification.

2.1.3. Alternatives Which Failed?

From the analysis of the Velvet Revolution, historian James Krapfl indicates five core values and ideas of the Czechoslovak protest in 1989: *"democracy, freedom, nonviolence, fairness, and humanness."*[155] Krapfl argues that around advocating these values, protestors created their demands on the state socialist government. After the most discredited leaders of state socialist regimes, such as Honecker and Husák, stepped down, a new consensus emerged in both societies, which followed revolutionary ideas. Within this frame, policies and ideas emerged in both countries that can be considered exceptional. Green roundtables in the GDR demanded broader natural protection of ecosystems and the development of renewable resources. Czechoslovak ministers dreamed about "sustainable development" and proposed limits on mining, reducing the demand for energy and other ecologically progressive policies.

In the first year after the revolution, ecological policy became more ambitious and active, mainly due to a change in priorities. State socialist politicians' hope to improve the environment by increasing productivity and efficiency was abandoned. Under the new democratic regime, ecological policies had to focus on directly helping the environment, with the growth of certain sectors of the economy considered crucial, but not every type of production. Josef Vavroušek and his team from the federal government expressed this logic in their conception of state ecological policy:

> "The prerequisite for the effectiveness of the state environmental policy is the intensive cooperation of both republics with federal institutions. Only in this way can

[154] Gunther Heydemann, and Detlev Brunner, *Die Einheit und die Folgen: eine Geschichte Deutschlands seit 1990* [*Unity and its Consequences: A History of Germany since 1990*] (Bonn: Bundeszentrale für politische Bildung, 2021), 225.

[155] James Krapfl, *Revolution with a human face: politics, culture, and community in Czechoslovakia, 1989-1992* (Ithaca: Cornell University Press, 2013), 80.

> a sufficiently effective defence be created against the threat of further sharp deterioration of the quality of the environment in our country as a result of the unilateral development of business activities oriented towards immediate financial gain."[156]

However, these futures did not prevail. People from Central Europe got neoliberal reforms by national liberal-conservative politicians, and inferior access to the global market, which brought them, on the one hand, improving living standards and solutions to some ecological problems, but on the other, precarization, insecurity, and, compared to the West Germans and other West Europeans, an inferior position in the production-consumption chain. Partially domestic elites, which were followers of the neoliberal consensus and partially international hegemony of austerity and pro-market policies, prevailed in the shaping of tuning points in 1989 in the region. Jürgen Habermas was right when he called the revolutions of 1989 as "Die nachholende Revolution" ("The Catch-up Revolution"), which aimed an imitation of the Western socio-economic and political model which was considered and presented as "the best from the all possible worlds."[157]

2.2. Finding a Way Out of the Dilemma: Again

The ecological crisis did not disappear with the collapse of state socialist regimes. The new governments of Czechoslovakia and reunified Germany faced the same consequences of the political ecology of state socialism. This was based on exploiting the ecosystem without considering its ability to regenerate and on the socio-economic structure of industrial modernity fuelled by burning low-quality lignite coal. Like their communist predecessors, the architects of neoliberal transformations faced an old-new challenge after the failure of alternative attempts to formulate new ecological policies. They needed to find a way to navigate the paradoxical dilemma between the demand for cheap energy from lignite coal to power the

[156] Josef Vavroušek, ed., *Návrh zásad státní ekologické politiky*, Czech National Archive, 35.
[157] Jürgen Habermas, Die nachholende Revolution: kleine politische Schriften VII. (Frankfurt am Main: Suhrkamp, 1990).

increase of industrial production and living standards and the threat of ecosystem or even climate system collapse on the other. This subchapter describes ecological and energetic policies by which the new post-1989 regimes wanted to address this dilemma.

2.2.1. Neoliberalism on March: Kohl's Reunification and Klaus's Reform

As pointed out by historian Philipp Ther, the German reunification was not uniting of two equal states – of course, despite all official proclamations, it was instead an accession of newly formed five federal states from the past GDR's districts to the already existing political, legal order, and socio-economic system of the Federal German Republic.[158] Besides that, new federal states accessed not only old Germany but also the global market, and from the very beginning, East German newly privatized companies had to compete on the worldwide market with their Western counterparts. According to Ther, Kohl's policies can be described as specific neoliberal shock doctrine, even though architects of reunification treaties, such as West German finance minister Theo Waigel and Wolfgang Schläuble, were not neoliberals or German versions of "Chicago boys." Ther writes that the reunification shock transformation had three main characteristics. Firstly, the devaluation of GDR's currency and thus the loss of value of East Germany's savings and exports became so cheap that typical GDR goods, such as cars, "Wartburg," could not be competitive. The second shock was the liberalization of the international market. Supermarkets and shops in the East were flooded with cheaper and quality goods, and Western European producers celebrated gaining new markets with sixteen million consumers. Thirdly, GDR's government founded a privatization administration called "Treuhandanstalt," or "Trauhand," which was responsible for over 12,000 companies with 4 million employees and large housing and estate properties. Under the Kohl's government,

[158] Philipp Ther, *Das andere Ende der Geschichte: über die Große Transformation* [*The Different Ends of History: About the Great Transformation*] (Berlin: Suhrkamp, 2019), 77.

almost 10,000 companies were sold. "When so many companies are thrown onto the market, their price must fall drastically," Ther comments on the pace of privatization.[159] However, the transformation had a clear result – many former GDR companies were sold to Western capital. Thus, neoliberalization cannot be seen as a single reason: the accession to the global markets or, with Immanuel Wallerstein, the capitalist world system, followed by changes in capital flows and the ownership structure in the former GDR regions.

This model of reunification shaped ecological policies in the former GDR federal states. East German industry and the energetic complex were forced to choose between shutting down or paying a large amount of money for desulphurization, and other measures led to the "ecologization" of their operations.

2.2.2. Deindustrialization as an Energetic Policy?

In December 1991, the cabinet of Helmuth Kohl suggested "Energiepolitik für das Vereinigte Deutschland" (Energy policy for a united Germany). This conceptual document presented the main principles of new strategies regarding energetics and reducing industrial pollution. By introducing privatization and pro-market measures, he wanted to transform the GDR's economy and energy sector and integrate it into the existing West German infrastructure. According to Kohl's government, challenges regarding the energetic policy came from three changes at that time: an increase in greenhouse gas emissions, European integration, and the implosion of state socialist regimes in Central and Eastern Europe. The document mentioned seven main lines of the new German energy policy:

> "a) Security of supply, economic efficiency, environmental compatibility, and resource conservation will remain indispensable and equally important energy policy goals in the future.

[159] Ther, *Das andere Ende der Geschichte: über die Große Transformation*, 80.

b) Ecological aspects must be considered in all energy policy decisions. What is ecologically necessary must be organized economically.

c) Energy policy must be oriented towards the market economy. In addition to regulatory law, economic instruments should be increasingly used in environmental policy.

d) Supply security is guaranteed primarily through diversification of energy sources and sources of supply and through the utilization of domestic energy sources; the conditions of the European internal market must also be observed.

e) The economic and rational use of energy and the increased development and utilization of renewable energies are essential to protecting the climate, conserving resources, and ensuring the security of supply.

f) Economic efficiency requires energy supply at the most favourable macroeconomic cost. The economic costs of environmental protection and supply security must be considered as far as possible.

g) National energy policy must be further integrated into European and international energy policy. This requires intensive coordination within the European Community, close contact with partners in the International Energy Agency, and increased cooperation with Central and Eastern European countries and the Soviet Union."[160]

Kohl's program aimed to introduce market reforms into the energy sector of the new federal states. The government intended to continue operating nuclear power plants and develop new renewable sources to ensure enough resources. Besides that, Kohl's government allowed the closure of several mining facilities and power plants that used lignite coal. According to their data, over 107,000 workers in the coal sector were concentrated around the

[160] *Das energiepolitische Gesamtkonzept der Bundesregierung Energiepolitik für das vereinte Deutschland* [*The Federal Government's overall energy policy concept Energy policy for a united Germany*], "Das energiepolitische Gesamtkonzept der Bundesregierung Energiepolitik für das vereinte Deutschland," Deutsche Bundestag, last modified May 24, 2024, https://dip.bundestag.de/vorgang/das-energiepolitische-gesamtkonzept-der-bundesregierung-energiepolitik-f%C3%BCr-das-vereinte-deutschland/137906, 4-5.

industrial centres of Halle/Leipzig and Cottbus/Senftenberg/Hoyerswerda, and the government expected that by the end of 1991, around a quarter of them would be laid off from their jobs.[161] The government aimed to keep energy generation in line with demand, offer workers new jobs and decrease pollution. To achieve this, the government approved the construction of new "modern" power plants based on the burning of lignite, with filtration systems in place to mitigate negative ecological impacts. Kohl's government also introduced pollution taxes and norms to pressure private companies operating in the lignite coal sector to clean their facilities and cover expenses for measures that protect the environment. The government's energy plan hoped for large polluters, now private companies, to invest in filtration systems and other facilities to reduce emissions of sulphur, nitrogen dioxide, dust, and other pollutants in the domestic and international markets. Unlike in the state socialist era, private operators of lignite power plants and other infrastructures, without the barrier of a weak currency, were partially successful in purchasing necessary filtration components. The result was that emissions of sulphur dioxide and other pollutants sank rapidly between 1990 and 2000, especially in the energetic and industrial sectors.[162] To summarize, Kohl and his government gave the responsibility for pollution to the private sector, which partially introduced ecological measures alongside the governmental norms on pollution. However, many industrial and energetic facilities closed down during the transformation period, and the massive deindustrialization in the new federal states caused a large part of the decrease in pollution.

[161] "Das energiepolitische Gesamtkonzept der Bundesregierung Energiepolitik für das vereinte Deutschland," Deutsche Bundestag,

[162] Marion Dreher, ed., *Übersicht zur Entwicklung der energiebedingten Emissionen und Brennstoffeinsätze in Deutschland 1990 - 2017 unter Verwendung von Berechnungsergebnissen der Nationalen Koordinierungsstelle Emissionsberichterstattung* [*Overview of the development of energy-related emissions and fuel use in Germany 1990 - 2017 using calculation results from the National Coordination Centre for Emissions Reporting*] (Umweltbundesamt, 2019), 13.

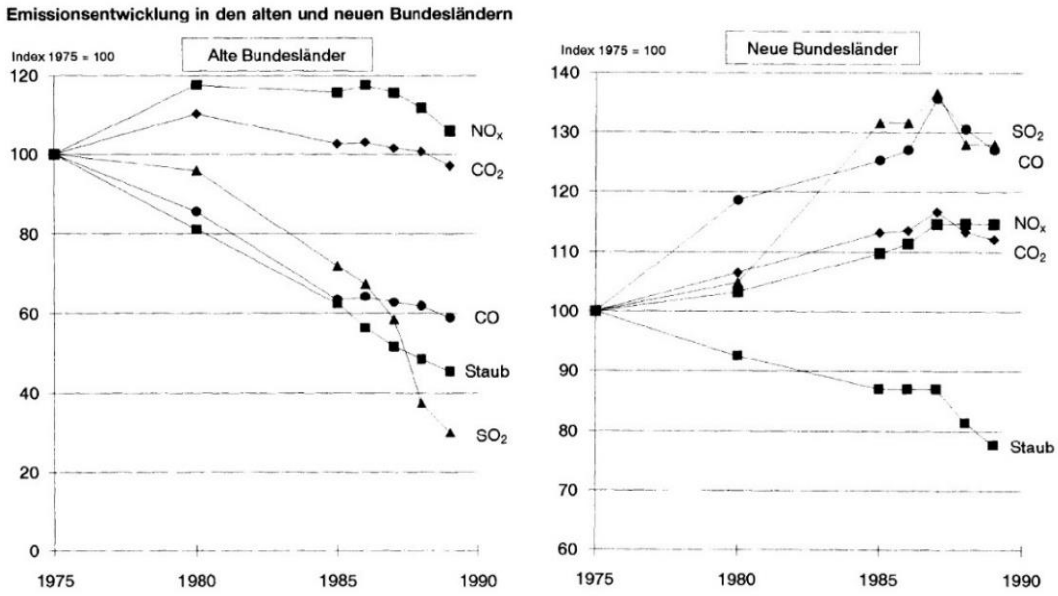


Figure 8 Emissions of air pollutants in "old" and "new" federal states. "Das energiepolitische Gesamtkonzept der Bundesregierung Energiepolitik für das vereinte Deutschland" ["The Federal Government's overall energy policy concept Energy policy for a united Germany"], Deutsche Bundestag, last modified June 3, 2024, https://dip.bundestag.de/vorgang/das-energiepolitische-gesamtkonzept-der-bundesregierung-energiepolitik-f%C3%BCr-das-vereinte-deutschland/137906, 23.

As mentioned above, the rapid decrease of workplaces in the coal sector was just one of the signs of the process of deindustrialization, which affected steelworks, chemical works, and other industrial sectors in the former GDR. In the 1990s, these policies brought Germany to the middle of an economic crisis. According to Detlev Brunner and Günther Heydemann, "the crisis was fuelled by several sources: It was a unification crisis that was reflected in high unemployment and the deindustrialization of the eastern German states due to overly positive assumptions and decisions that supposedly had no alternative." [163] Kohl's government introduced several measures to create new jobs and allowed miners from the lignite mines to go on early pensions. However, these measures could not rescue the broader collapse of the

[163] Heydemann, and Brunner, *Die Einheit und die Folgen: eine Geschichte Deutschlands seit 1990*, 127.

GDR's industrial model and contributed to the widespread dissatisfaction of citizens from the former GDR with the reunification process.

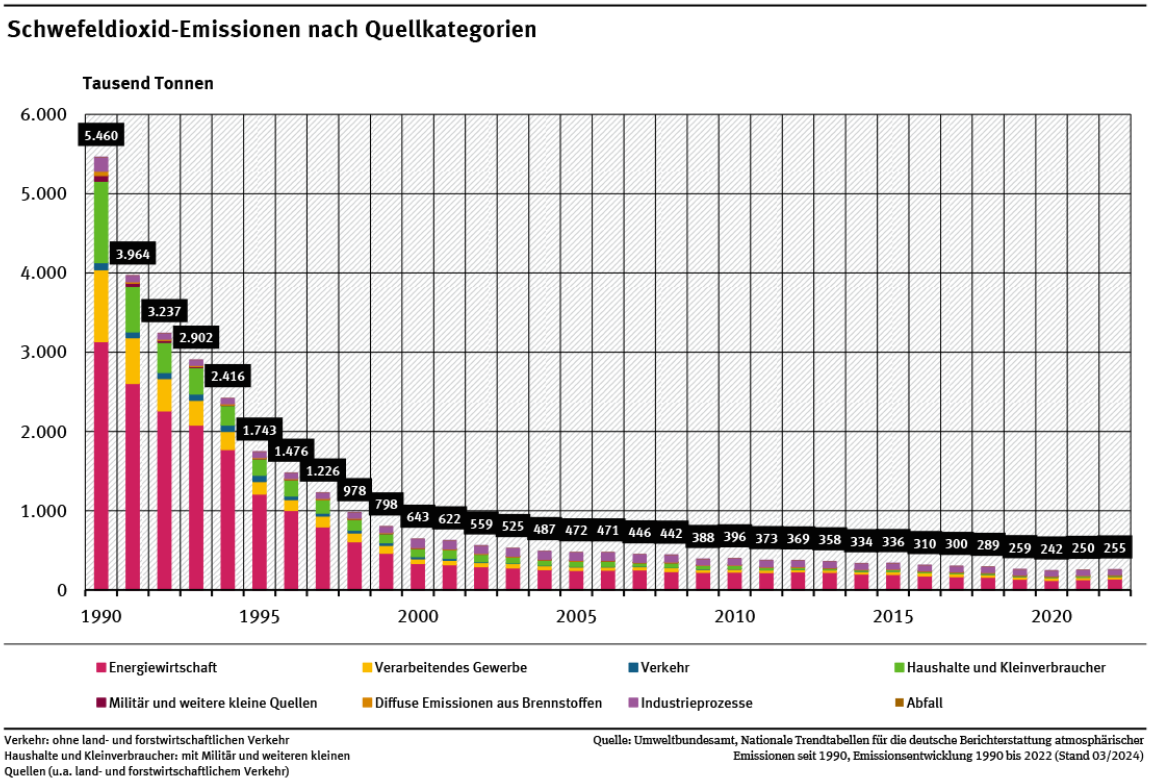


Figure 9 Total sulphur dioxide emissions of Germany by the sector. "Schwefeldioxid-Emissionen," Umweltbundesamt.de, last modified June 3, 2024, https://www.umweltbundesamt.de/daten/luft/luftschadstoff-emissionen-in-deutschland/schwefeldioxid-emissionen#entwicklung-seit-1990.

Kohl's government considered western Germany as a model for the former GDR. As such, they introduced environmental norms and policies, which were designed in the Western German context, and although by these policies, Federal Republic Germany was able to reduce its emissions of toxic substances into the air, these policies were developed by governments and gradually implemented throughout almost three decades; for new federal states, these norms came to the force practically from the point of signing reunification treaty.[164] For

[164] Dieter Rink Bundeszentralle für politische Bildung., "Umwelt."

desulphurization, coal power plants continued the installation of electro filters and facilities for the lime additive process. In 1995, German energy facilities produced around 7 million tonnes of waste lime, half of which was used in the construction industry.[165] Operators of coal power plants lower temperature during the combustion, which reduces emissions of nitrate oxides significantly. Operators had to redirect finances to the desulphurization facilities, and by using capacities and know-how from the West German Ruhr Valley industrial area and access to the global markets, they successfully reduced a significant portion of sulphur and nitrogen dioxide emissions.

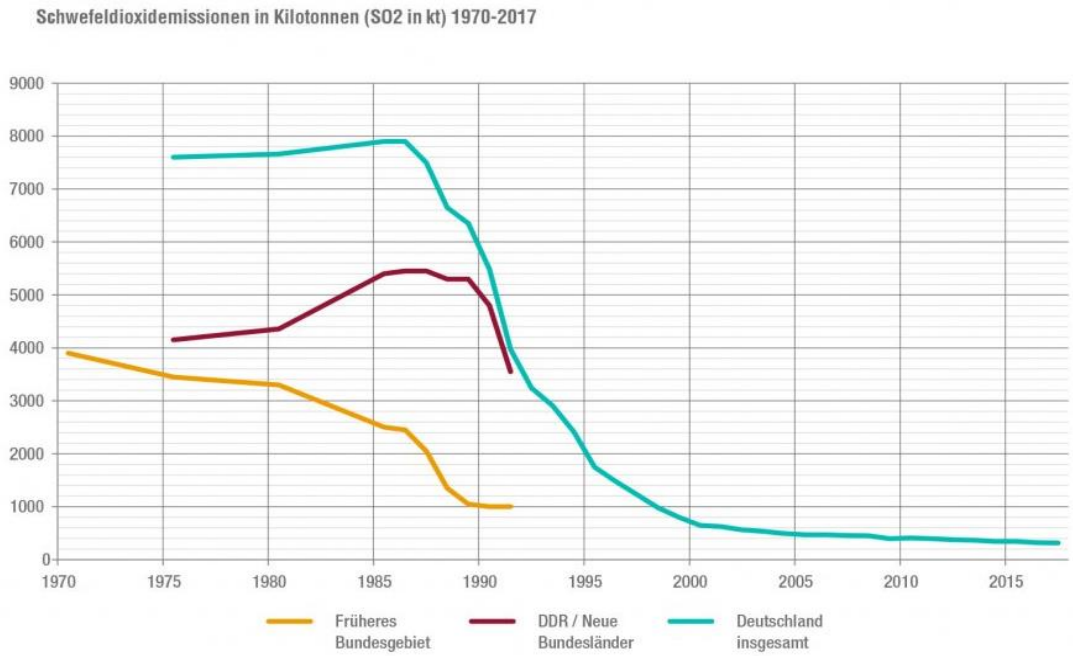


Figure 10 Emissions of sulphur dioxide in new federal states and total. Dieter Rink, "Umwelt," Bundeszentralle für politische Bildung, last modified June 3, 2024, https://www.bpb.de/themen/deutsche-einheit/lange-wege-der-deutschen-einheit/47350/umwelt/#node-content-title-3.

[165] Karl-Heinrich Grote and Jörg Feldhusen, *Dubbel Taschenbuch für den Maschinenbau* (Springer-Verlag, 2011), 52.

Thus, the most visible part of inherited "ecological problems" – local air pollution – was solved. But for which cost? Many companies went bankrupt, and environmentally harmful facilities were shut down. That was something that Honecker and other state socialist politicians could not dare even to suggest because of the fact that the socio-economic model of GDR, the same as the political consensus, came from the existence of a robust industrial production complex and its outcomes – production of consumption goods. The reduction in emissions was more or less a side effect of Kohl's shock reunification, which allowed his government to reduce the industrial base of the former GDR because it was no longer necessary. The harsh impact of transformation and Kohl's politics opened the floor to the oppositional Social Democrats and Green party, which won the election with the promise of wide change in the governmental policies and, at the very end of the 1990s, the government of Gerhart Schröder from SPD and Joschka Fischer from Green party introduced a series of laws and strategies that aimed to found a different paradigm.

2.2.3. Czech Private Modernization with the State Guarantees

During the first three years after the Velvet Revolution, bit by bit, Czechoslovak horizons of expectations narrowed down. The vision of the future promoted by the new political leader, Václav Klaus, consisted of privatization and a free market prevailing over the other possible futures. In the governmental program statement, Klaus claimed:

> "It is not only the environment that we have inherited in a poor state but also the economy, education, health, and other areas. However, a thriving economy guarantees sufficient resources to fund environmental programs and gradually repair inherited damage. The general principle guides the Government that the real interests of

> protecting and creating a healthy environment are not in conflict but in harmony with the goals and methods of economic development and the market economy."[166]

Ecological policies became inferior, and instead of improving ecosystem standards, the issue was to transform the state-controlled energetic sector into a private sector operating on the free market. In October 1993, Vladimír Dlouhý, Minister of Industry and Trade from Klaus' ODS, suggested a new energetic law.

> "The basic task of the state's energy policy is to ensure sufficient energy in the widest possible range for all interested parties and at a favourable price. A favourable price is a price that will have the least possible impact on the standard of living of the population and will not disproportionately burden the price of final industrial products. Therefore, the energy price in final consumption must cover only the costs of its acquisition and transport to the consumer and a reasonable profit."[167]

Klaus's government resigned on more active, energetic policies. Contrary to Moldan's approach, they designed the whole legal framework not to support the recovery of ecosystems and living environments but to support a free market economy through revenues from the energetic sector in the hope that the profit from private companies would spread through the economy to the population and improve standards of living. This conception of energetics completely fitted Klaus' logic of economic transformation, as historian Václav Rameš describes, to bring fast and radical economic transformation from the planned economy system to the "market without adjectives."[168]

However, this ambition for privatization and marketization of the energetic sector in Czechoslovakia and the Czech Republic needs to be mentioned in the context. To do so, two

[166] *Programové prohlášení vlády* [*Government Programme Statement*], in "Programové prohlášení vlády [Government Programme Statement] - Vláda Václava Klause I. (2. 7.1992 – 4. 7. 1996)," Vláda České republiky, last modified May 24, 2024, https://vlada.gov.cz/scripts/detail.php?id=26624.

[167] *Návrh Energetického zákona* [*Proposal of the Energetic Law*]. Czech National Archive, Prague, Ministry of Environment, item 4, 6.

[168] Rameš, *Trh bez přívlastků, nebo ekonomickou demokracii? Spory o podobu vlastnické transformace v porevolučním Československu*, 313.

points are crucial. Firstly, most of the energetic sector in the Czech Lands after 1989 has been controlled by a hybrid entity of Czechoslovak Energetic Works (Československé energetické závody, ČEZ), which was and still is partially owned by the private shareholders and the state. All measures regarding electricity supply and reducing pollution were put into this semi-private company during the privatization. As such, the company was responsible for the emissions, not directly the state. However, the state still had a decisive amount of shares in the company ČEZ and control of its strategic investments, shown in the example of finishing the nuclear power plant Temelín during the 1990s and early 2000s, guaranteed by the state. The second point is that Klaus's government had free hands in the question of high pollution levels because most of the economically harmful decisions made by the cabinet of Petr Pithart. For instance, some high-pollution facilities may be closed down, and new filters on the key lignite power plants may be bought. Moreover, on the proposal of Moldan's ministry, the key law on state air quality protection was introduced in 1991. Thus, ČEZ and other smaller energetic companies had enough time to adapt to the conditions and harsh fees for pollution, which, according to the law, were supposed to come into force in 1997. Klaus's government just utilized the decisions of their predecessors and, under the new circumstances, where pollution was significantly reduced, could put ecology on the back burner and reorient the energetic sector to generate revenues and capital.

This change in the political economy of Klaus's government had significant consequences. Some Czech coal mines and power plants were kept in operation because, under privatization, new private owners installed filters or successfully got around pollution limits and continued generating electricity from coal sources. As Bohuml Frantál noted, "the Czech Republic has also been regularly among the biggest world net exporters of electricity, with the

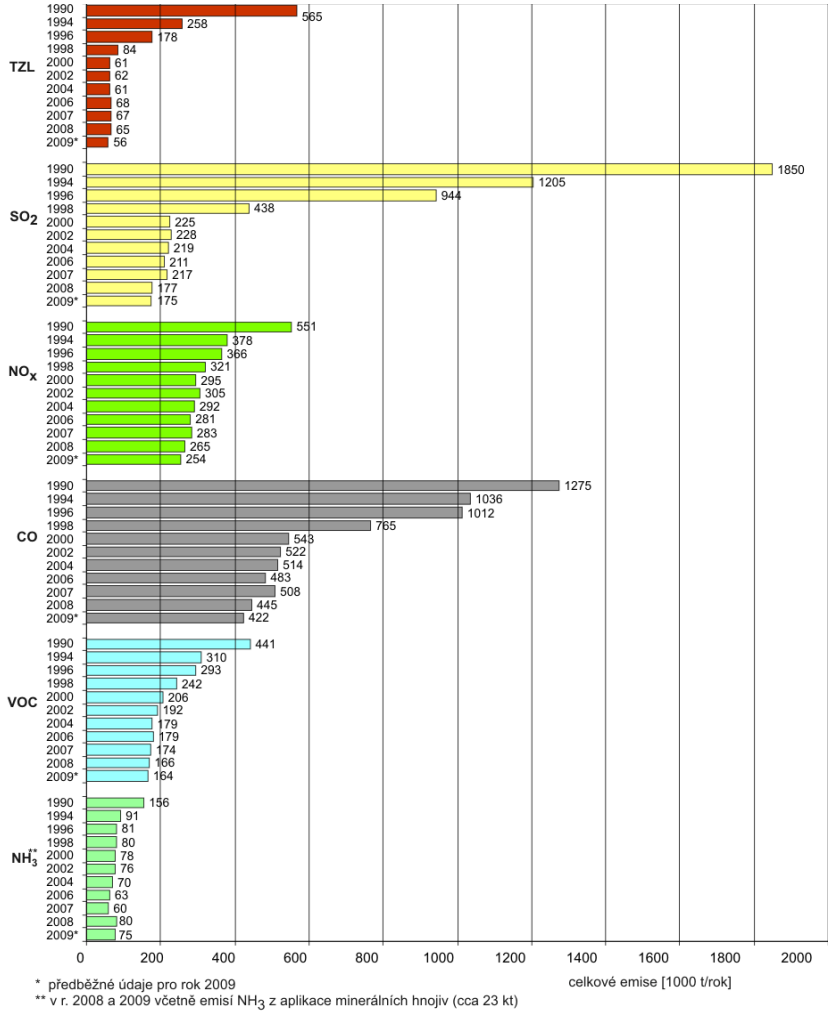
annual net export about 17 TWh."[169] The export of electricity flowed mainly to Germany. Thus, revenues of ČEZ, Sev.en, or EPH have been, until today, generated at the expense of the Czech landscape, ecosystems, and society, as Frantál claims:

> "The burning of coal and exportation of electricity abroad has been considered a form of landscape commodification and exportation, which raised questions of environmental injustice or the uneven spatial and social distribution of benefits (economic profits for mining companies, energy producers and stakeholders) and costs (environmental, economic and social impacts on host regions and local communities) of coal energy."[170]

Despite doubts about the post-socialist transformation of energetic systems, sulphur dioxide emissions decreased slower in the Czech Republic compared to East Germany. The reason for this difference should be analysed using more precise data observation. However, I assume that in Czechoslovakia and the Czech Republic after the split of the federation in 1993, the energetic companies had more time to reduce pollution by installing technologies of filtration and redesigning facilities for power generation from lignite than in the "new" federal states of Germany. The phenomenon of deindustrialization also emerged in Czechoslovakia and was one of the main drivers of the decrease in emissions; however, albeit not to the extent comparable to eastern parts of reunified Germany. Despite the radical sinking of emissions in Germany between 1990 and 1995 (figures 8 and 9), when over two-thirds of the emissions decreased, the Czech emissions were in 1995, half of their amount in 1990. The radical decrease came after 1997 when the law on air quality protection came into force (Figure 11).

[169] Bohumil Frantál, "Under the curse of coal: Mined-out identity, environmental injustice and alternative futures for coal energy landscapes (The case of the Most region, Czech Republic)," in Stefan Bouzarovski, Martin J. Pasqualetti, and Vanesa Castán Broto, ed., *The Routledge Research Companion to Energy Geographies* (New York: Routledge, 2017), 206.

[170] Frantál, "Under the curse of coal: Mined-out identity, environmental injustice and alternative futures for coal energy landscapes (The case of the Most region, Czech Republic)," 206.



Celkové emise základních druhů látek znečišťujících ovzduší v České republice, 1990–2009

Figure 11 Total emissions of basic air pollutants in the Czech Republic between 1990 and 2009. "Znečištění ovzduší v České republice v roce 2009" ["Air Pollution in Czech Republic in 2009], Czech Hydro-meteorological Institute, last modified June 3, https://www.chmi.cz/files/portal/docs/uoco/isko/grafroc/groc/gr09cz/sezobr.html.

To understand the political movement Klaus represents, it is not enough to consider it neoliberal. As political theorists Ondřej Slačálek and Daniel Šitera argue, the Klaus government was not a direct part of the neoliberal movement of global western elites; they were instead "neoliberal nationalists" who wanted to promote emerging of the market "without adjectives," found private companies and deregulate economy processes, but besides that, they

opted for Czech capital, Czech private companies and bring shock therapy moment which supposed to make Czech economy stronger.[171]

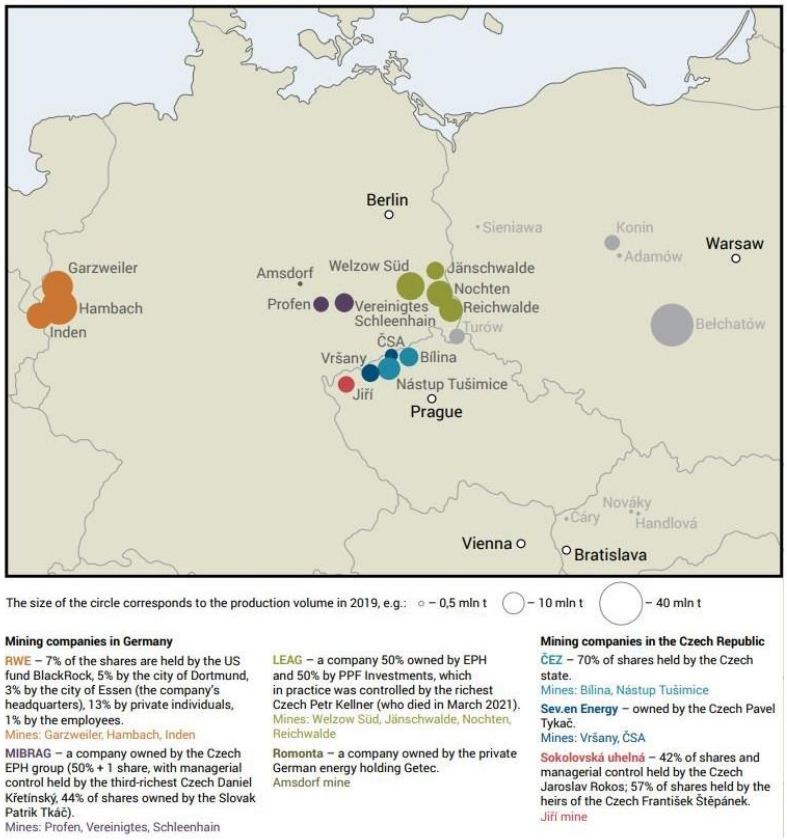


Figure 12 Map of lignite mines in Germany and the Czech Republic. Krzysztof Dębiec, and Michał Kędzierski, "Lignite in the Czech Republic and Germany: controversies and prospects," Centre for Eastern Studies, last modified June 3, https://www.osw.waw.pl/en/publikacje/osw-commentary/2021-03-31/lignite-czech-republic-and-germany-controversies-and-prospects.

Thus, Klaus's energetic policies allowed the foundation of several new energetic companies owned by the Czech entrepreneurs: Sev.en Group of Pavel Tykač and later the Energeticko-průmyslový holding (Energetic-industry holding, EPH) owned by Daniel Křetínský, which operates mainly with fossil fuels-based sources. Thus, lignite has been in use

[171] Daniel Šitera, and Ondřej Slačálek, "Czechia 30 years On: An Imperfect Oligarchy Without Emancipatory Alternative." In Gagyi, Agnes, and Ondřej Slačálek, *The Political Economy of Eastern Europe 30 Years into The 'Transition'*, (Switzerland: Springer International Publishing, 2021), 133-150.

in the Czech Republic until now. The Czech energy sector is dominated by centralized power sources in the ownership of ČEZ, Sev.en, EPH, and other smaller, mostly heating companies. Paradoxically, decades after the Velvet Revolution, the Czech government and private companies achieved goals that state socialist technocrats had dreamed of, such as cleaning coal and building large, centralized, energetic systems with low sulphur dioxide emissions. The state strongly regulated the energetic sector but also gave many guarantees to private companies and ČEZ, which can gain significant profits. By this politics, the immediate threat of the collapse of forest ecosystems, the worsening of the health of the population, and other problems related to air pollution seemed to be solved.

2.2.4. "Energetic policy for 21st century"

The "reunification" economic crisis of the 1990s raised the need to change the course. Kohl's coalition lost the federal election in 1998, and a new government formed by Social Democrats (SPD) and the Green Party started with the reform program. The leader of SPD, Gerhard Schröder and Joschka Fischer from the Green Party, formulated a reform program for the coalition government, which was based on two pillars: solidary social policy and ambitious ecological policy. The program was called *New Beginnings and Renewal - Germany's Path into the 21st Century* and proposed fourteen main points:

1) Strengthen economic power through sustainable growth and innovation and create sustainable jobs,

2) Use ecological modernization as an opportunity for work and the living environment

3) Regain the state's financial capacity to act by reorganizing public finances

4) Secure future-oriented education and training for all young people and create equal opportunities

5) Secure and modernize the welfare state and strengthen a society based on solidarity

6) Renew the intergenerational contract and place it on a new footing

7) Secure and preserve the natural foundations of life for future generations, create a child- and family-friendly society

8) Guarantee security for all

9) Strengthen civil rights and social democracy and re-establish a culture of tolerance in a society based on solidarity

10) Decisively advance the equality of women in work and society

11) Complete the internal unification of Germany by further harmonising working and living conditions

12) Modernize the state by bringing administration closer to the people and reducing unnecessary bureaucracy

13) Further developing peaceful and cooperative partnerships with our neighbours, advancing the enlargement and deepening of the European Union, strengthening solidarity with the countries of the South, and promoting sustainable development worldwide

14) Promote cooperation with the churches and other social groups and associations[172]

The program priorities of Schröder's government were influenced by changes in ecological policy strategies. In the 1990s, the discussion about environmental crises shifted, especially after the Earth Summit in Rio in 1992.[173] This summit marked the beginning of

[172] *Aufbruch und Erneuerung - Deutschlands Weg ins 21. Jahrhundert - Koalitionsvereinbarung zwischen der Sozialdemokratischen Partei Deutschlands und Bündnis 90/Die GRÜNEN* [*New Beginnings and Renewal - Germany's Path into the 21st Century - Coalition Agreement between the Social Democratic Party of Germany and Alliance 90/The Greens*], in "Koalitionsvereinbarungen der SPD auf Bundesebene," Friedrich-Ebert-Stiftung, last modified June 3, 2024, https://www.fes.de/bibliothek/koalitionsvereinbarungen-der-spd-auf-bundesebene.

[173] More about the conference in Rio in Ranee K. L. Panjabi, *The Earth Summit at Rio: Politics, Economics, and the Environment* (Northeastern University Press, 1997), or Pamela Chasek, and Lynn M. Wagner, ed., *The Roads from Rio: Lessons Learned from Twenty Years of Multilateral Environmental Negotiations* (New York: RFF Press, 2012).

global efforts to reduce greenhouse gas emissions and prioritize sustainable development, as recommended by the United Nations. Unlike the 1980s, the main environmental concern in global negotiations was no longer sulphur dioxide emissions but rather greenhouse gases (GHG) that threatened the global climate system. These gases could significantly alter the global climate rather than just impacting local ecosystems. The SPD and Greens tailored their program to align with the increasing focus on climate change.

Schröder's strategy was to motivate the private sector to switch to "modern" and "clean" technologies by introducing special "ecological taxes." The tax reform aimed to encourage companies to invest in innovations. Additionally, the public budget needed finances for a more active social policy, and the money from the ecological tax was used to decrease non-wage labour costs, ultimately lowering labour costs.[174] In the program, Social Democrats and Greens considered ecological policy as an opportunity not for improving the condition of ecosystems but rather for the social situation of workers. Contrary to Kohl's and Klaus's approach, the growing economy was not perceived as a priory ecological – in the program of red-green government, it was rather about the continuous effort for the transformation towards "sustainable growth." Schröder's government did not want to let markets do their work, but they tried to direct them toward the ecological and socially solid direction. In this point, the red-green coalition had a similar strategy as Moldan and Vavroušek ecological policies in the early 1990s Czechoslovakia.

Among the central policies that the red-green coalition introduced in Germany was renewable energy development. In the energy policy strategy for the 21st century, the German government's energy concept for phasing out nuclear energy approved the phase-out of coal and nuclear power plants and transformed the energy systems towards renewable energy

[174] Heydemann, and Brunner, *Die Einheit und die Folgen: eine Geschichte Deutschlands seit 1990*, 225.

sources, mainly wind and solar.[175] This shift towards a vision of an energetic system powered by renewables was crucial regarding technology use. Previously, large, centralized energy sources were the norm, but now it has become possible to use technology that favours decentralization. [176] Shortly after implementing the first laws and policies within the government's energy strategy, there was a gradual increase in the use of renewable sources. However, Schröder's government was still not successful in solving the main social problems in Germany, and during the so-called Hartz reforms, introduced several policies, which even increased frustration in the new "federal" states because reforms pushed many workers into the uncertain, precarious jobs and offered social programs with disciplinary elements towards the unemployed. [177] The need for a fundamental change in the socio-economic model was addressed through gradual reforms and the introduction of innovations. As the millennium ended, German ecological policy aimed for modernization while emphasizing strong social reforms to "harmonize" society and "nature." The core ideas of these social-ecological policies were similar to pre-1989 attempts at green modernization. In essence, Schröder's government suggested investing in renewable energy or gasification and implementing ecological taxes instead of relying on market solutions that would allow polluting industries to go bankrupt. Like previous political leaders, they aimed to sustain the socio-economic model of industrial modernity. With some parametric adjustments, this form of "green modernization," which reduces social costs, remains a dominant approach to ecological policies today.

[175] "Energiepolitik für das 21. Jahrhundert - Energiekonzept der Bundesregierung für den Ausstieg aus der Kernenergie" ["Energy policy for the 21st century - the German Government's Energy Concept for Phasing out Nuclear Energy"], Deutsche Bundestag, last modified May 24, 2024, https://dip.bundestag.de/vorgang/energiepolitik-f%C3%BCr-das-21-jahrhundert-energiekonzept-der-bundesregierung-f%C3%BCr/102305.

[176] More regarding socio-economical characterists of renewables energy in David McDermott Hughes, *Who Owns the Wind?: Climate Crisis and the Hope of Renewable Energy* (Verso Books, 2021).

[177] Economic frustration describes Till Hilmar in the chapter 4: *The Social Experience of the Transformation Period* in his book *Deserved*. Hilmar, *Deserved: Economic Memories After the Fall of the Iron Curtain.*

2.3. An Apparent Solution

In the late 1990s, it became evident that the issues of sulphur dioxide emissions, forest damage from acid rain, and the deterioration of the ecosystem and human health due to air pollution had been addressed mainly in East Germany and the Czech Lands. However, how did post-socialist regimes in both countries achieve this?

As I have already shown, the fall in sulphur dioxide emissions was caused by many factors. Setting up emissions and mining limits decreased the mined lignite; the return ability of brown coal increased significantly due to the risk of fees and the reduction of the market by the deindustrialization in the production centres of the former GDR and Czechoslovakia. The rest of the emissions were reduced by filtration and separator systems and by transforming towards different energy sources such as natural gas and later in the Czech Republic to nuclear power from the newly constructed two-reactor power plant in Temelín. The question of outsourcing the emission of sulphur dioxide is critical. In the early 2000s, especially after China joined the World Trade Organization in 2001, there was a significant increase in trade exports from China to countries in the global North. This led to higher levels of air pollution and sulphur dioxide in many Chinese provinces due to increased burning of lignite coal. China became one of the world's most significant producers of goods, driven by increasing coal use. [178]

However, the shift in global production and trade chains cannot be directly linked to the decrease in emissions in eastern-central Europe. Instead, it is about the mechanism of the global capitalist system relying on the dynamic process by which capital seeks better conditions for generating profit and sustaining its accumulation. When the economies of former Czechoslovakia and the GDR transformed into market economies and became connected to the

[178] Feng Wang, Yongyuan Li, Wei Zhang, Pan He, Ling Jiang, Beiming Cai, Jing Zhang, Pengyan Zhang, Haoran Pan, Hongqiang Jiang, "China's trade-off between economic benefits and sulphur dioxide emissions in changing global trade," *Earth's Future* (2020), 8.

capitalist system, “dirty” production could be moved elsewhere, and goods could be imported from other countries within the global market, offering cheaper labour and resources, resulting in lower prices for goods.

Through various policies, such as stricter emission limits, mining restrictions, filter installations, innovative technologies, gasification, and reduced energy consumption, as well as significant deindustrialization after 1989, the Czech and German governments achieved considerable success in reducing high levels of sulphur dioxide and other harmful emissions that had polluted the air for many years. However, the ecological crisis was not completely resolved.

The energetic systems in industrial societies primarily rely on burning fossil fuels, which leads to the release of greenhouse gas emissions. These gases, produced from burning oil, natural gas, or coal, enhance the Earth’s climate system’s ability to trap more energy from the Sun, increasing the average global temperature. According to the Intergovernmental Panel on Climate Change, rising temperatures will inevitably lead to significant changes in critical climate systems, creating conditions that differ from those to which human societies and civilizations have been accustomed for thousands of years.[179] Scientific research on climate change threats has been ongoing since the 1970s and the international community has been negotiating policies to reduce greenhouse gas emissions since the 1980s. While progress has been made in addressing sulphur dioxide emissions, industrial modernization has led to additional severe environmental problems.

[179] IPCC, *Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* (IPCC, Geneva, Switzerland, 2023), or Richardson, Steffen, Lucht, Bendtsen, Cornell, Donges, Drüke, et al., “Earth beyond six of nine planetary boundaries.”

2.4. Conclusions

Towards the end of the 20th century, Germany and the Czech Republic saw a decrease in sulphur dioxide emissions and the introduction of many ecological policies. However, this success had two sides. The reduction in emissions was mainly due to the significant deindustrialization in the "new" federal states and industrial regions in Czechoslovakia, Czech Republic, and Slovakia. Rather than the impact of ecological policies, the decrease in air pollution resulted from dismantling the Soviet bloc and opening up central and eastern European markets to companies from the capitalist world.

It is imperative to conduct a more in-depth analysis to accurately measure the extent of the emission decrease attributed to deindustrialization and the outsourcing of emissions to other parts of the world.[180] It is evident that both governments recognized this effect and used it to present the "democratic capitalist regime" as more environmentally conscious than state socialism. The reduction in emissions also mirrored the societal discontent in the industrial regions of the Czech Republic and the former GDR.

Expanding the capitalist production model from Western European countries and other parts of the capitalist world into the former Soviet bloc countries may have contributed to the decline in sulphur dioxide emissions. However, this expansion also introduced new ecological challenges, including greenhouse gas emissions and the continuous material and energetic infiltration of the global ecosystem. These challenges pose a more significant threat to the climate system than the ecological issues of the 1980s.

In the chapter, I tried to examine ways governments offered solutions to these problems. The German and Czech governments, from Modrow and Pithart in the last years of GDR and Czechoslovakia to the neoliberal governments of Klaus and Kohl, shared a vision of "green

[180] Knut Breivik, Rosalinda Gioia, Paromita Chakraborty, Gan Zhang, and Kevin C. Jones, "Are Reductions in Industrial Organic Contaminants Emissions in Rich Countries Achieved Partly by Export of Toxic Wastes?" *Environmental Science & Technology 2011*, no 45 (21), 9154-9160,

transformation" through new "cleaner" technologies to address environmental crises. Despite these similarities, there were several crucial differences. The architects of Czech post-November 1989 ecological policies prioritized the "sustainability" of the production-consumption process. In contrast, the Klaus government focused on harmonizing "economy" and "nature" through the prosperity of the private sector and economic growth. Similarly, in the case of Kohl, anything "ecological" had to be organized in an "economical" manner. These approaches are pillars of ecological policies until today.

In the following and last chapter, I try to synthesize the core of the political ecology of state socialism and new regimes after 1989 and formulate the main claim about the continuity of green modernization from the 1980s to the 1990s.

3. On the Phenomenon of Green Modernization and Its Continuities

The question about what changed and what remained the same over time is one of the fundamental questions of history as a discipline. In the first and second chapters, I tried to show the challenges regarding the environment and ecology that political regimes in Czech Lands and East Germany faced during the 1980s and 1990s. Based on the comparison of policies of late state socialism and post-1989 ecological promise to neoliberal ecology, I argue that there are some significant continuities.

On the first level, modern industrial society's broader civilizational dilemma persists despite the obvious successes in solving some particular ecological problems – the dilemma between the demand for cheap energy from fossil fuels to cheaply power the increase of industrial production and living standards on the one hand, and the threat of ecosystem or even climate system collapse on the other. On the second level, there are continuities in some ecological policies, which can be described as the continuity of "green modernization" – to overcome the degradation of the ecosystem and human health by modernizing the production process, introducing innovations, and "rationalization" of production. While it is true that, on this level of policies, there were some obvious differences in the conceptualization of what needed to be done and what needed to be achieved, the hope in technocratic management, innovations, and economic growth persisted. So, I contend that Štrougal and Reichelt, Moldan, and Vavroušek, with Modrow, as well as Klaus, Kohl, and Schröder, faced similar challenges linked to the dilemma of late industrial modernity, and secondly, that they wanted to solve this dilemma by modernization escape.

In this chapter, I show the continuities and possible discontinuities of Czech and German cases. I also want to go beyond the particular cases and make broader conclusions about Central Europe's socio-economic structures and political ecology. To do so, in the last subchapter, I

suggest three theses, which are also the primary outcomes of the thesis, and answers to the main research question: How can the political ecology of state socialism and democratic capitalism regimes in Central Europe be characterized?

3.1.1. Levels of Continuities and Discontinuities

The first step in describing what a comparison of the regimes in Czech Lands and East Germany and their air pollution policies can uncover is to elaborate more on the continuity within the story. I claim that, for instance, Štrougal's endeavours shared similarities with Moldan's and even with Klaus's ecological policies. The same situation I have shown in the case of Germany. However, I traced continuity not only on the level of policies but also on the level of "social-nature relations" and the political ecology of regimes before and after 1989, despite the fact that their socio-economic structures fundamentally changed from the centrally planned economies with the leading role of state institutions towards free-market economies with strong private capital which was more or less connected to the world capitalist system. So, I indicate continuity on the level of policies in the first place and secondly on the more abstract level of political ecology.

On the level of policies' continuity is possible to observe fast emergence of new norms, measures and laws after the implosion of Honecker's and Husák's leadership in the autumn of 1989. However it was not just a result of work of new political leaders, but rather the first post-socialist governments continued developing policies from the late 1980s. In these reforms, new decision-makers in Czechoslovakia and the Czech and Slovak Republics finished, but also went beyond the state socialist policies; in the former GDR, the situation was slightly different because of complete adopting many West German norms and legislatures regarding emissions. Nevertheless, I find more significant and consistent continuity in the second and more abstract level of the comparison. This continuity of political ecology can be labelled as the continuity of the civilizational dilemma and lies firstly in the paradoxical situation created by the late

industrial modernity mode of mass production and consumption fuelled mainly by lignite coal and fossil fuels, which delivered an increase in standards of living but simultaneously undermined foundations of life by causing multiple ecological problems and crises. Existing state socialist regimes, similar to democratic capitalism regimes, aim to sustain a high pace of production and consumption besides reducing environmental damage and pressure on ecosystems and public health – in other words, on the other parts *of the web of life*. To do so, leaders of these regimes, Štrougal, Klaus, Reichelt, and Kohl, believed in "green modernization": raising effectiveness and introducing innovation and technologies that should avoid "negative externalities" by boosting production. The details of this modernizing "escape forward" are examined in the next subchapter.

3.1.2. Escape by Modernization

Both state socialism and democratic capitalism shared a belief in modernization as a solution to issues related to the decline and exploitation of the environment. This idea echoes the traditional concept of industrialization and the implementation of large-scale manufacturing by capitalist entrepreneurs in the 19th century, as proposed by Karl Marx. In simple terms, factory owners can utilize mass production technologies to increase output at a reduced cost by introducing more productive machines and developing factories, and in Marx's era, "cost" primarily referred to worker salaries, resources, and capital. Marx claims in the *Economic and Philosophic Manuscripts of 1844* that workers and machines are perceived by capitalists only as *"…instruments of production which have to yield as much as possible with as little cost as possible."*[181] But after examining real existing regimes that proclaimed that they follow Marx – state socialist regimes of Czechoslovakia and the GDR – it is possible to note that the same approach towards the revolutionizing means of production was shared by KSČ's and SED's

[181] Karl Marx, *Economic and Philosophic Manuscripts of 1844* (New York: Dover Publications, 2007), 30.

apparatchiks as well as the capitalist described by Marx in the 19th century. Michael Heinrich, German political scientist and historian, claims in his interpretation of Marx's *Capital* that:

> "Today, it is far clearer than in Marx's time that not every industrial process of production simply has to be detached from its capitalist application to develop its purely beneficial effects suddenly. Some lines of development of industrialization are not just destructive as a result of their capitalist application: if atomic energy were put to use in a socialist society, then the risks would still be enormous, and the widespread use of fossil fuels would still lead to climate change. The destructive potential of capital does not just assert itself in the way a technology is applied, but in the choice of particular technical-industrial paths of development."[182]

Within the 1960s and 1970s in the Soviet bloc, exactly this process of revolutionizing highly productive machines and technological instruments was promoted by the new generations of Marxian philosophers such as Czechoslovak Radovan Richta, who developed a project of the science and technological revolution within socialist societies. Richta claimed:

> "In the immediate sense, capitalist production relations can be eliminated, and industrial production can be taken over for the aims of socialist society — and this may be regarded as the true achievement of socialist revolution."[183]

In the eyes of key technocratic-Marxist thinkers, the increase of productive forces and exploitation of the resources and capacities of the "natural environment" were inevitable instruments for achieving improvement of material conditions and socialist mode of living. Ecosystems, or, in Jason W. Moore's words, the *web of life*, were considered something outside the productive process that can and should be taken by using more and more effective instruments, which should be delivered by the techno-scientific revolution.

[182] Michael Heinrich, *An Introduction to the Three Volumes of Karl Marx's Capital* (New York: Monthly Review Press, 2012), 118.

[183] Radovan Richta, ed., *Civilization at the Crossroads: Social and Human Implications of the Scientific and Technological Revolution*, 49.

Nonetheless, the approaches of technocratic-Marxist thinkers were joined in conceptualizing relations between social and natural actors. As historian Weronika Parfianowicz describes, many debates about "limits to growth" emerged within the socialist camp.[184] Parfianowicz observes mainly conference discussions in the 1970s, which took place in Poland during the economic crisis, and were strongly influenced by the Club of Rome's report. Most participants were scientists with nature science backgrounds born at the beginning of the 20th century and were well conscious of the debates about the techno-scientific revolution. Still, they also perceived that scientific research "was not sufficient to transform socio-political reality effectively," notes Parfianowicz.[185] They criticized Richta's techno-optimist "revolution" and opted for changes in the length of the work week, prioritizing decent living for all beings on the planet instead of growing weal tog limited number of privileged, called for renewable energy and mainly, abandoning of the idea of never-ending growth of production and consumption. As Parfianowicz mentions, they underestimated the role of reproductive work and also supported the idea of technocratic management in the work force instead of democratization of the workplace.[186] Comparably to Bedřich Moldan, which was also strongly influenced by the Club of Rome's report on "limits to growth", polish "ecosocialists," as Parfianowicz calls them, were more explicit in the possibilities of the transformation of the existing state socialist order.

However, Richta's influence was key, and it was not just theorizing. Richta's concept of the science and technological revolution was a driving force that led to a significant shift in the Czechoslovak regime's energy production strategy. From the 1960s to the mid-1980s, the regime dramatically increased the production of coal and its burning to generate electricity and heat (Figure 13). This was not just to secure essential services such as energy for household

[184] Parfianowicz, "Limits to Socialist Growth," 41-66.
[185] Parfianowicz, "Limits to Socialist Growth," 54.
[186] Parfianowicz, "Limits to Socialist Growth," 63.

activities but also to fuel the production process in factories. The old model, where each factory had its own smaller electricity or heat source, was abandoned in favour of a large, centralized, energetic infrastructure. The electrification of rural areas and urbanization depended on establishing such energetic systems, and coal was deemed suitable for this purpose.

Moreover, Richta and his followers had a clear conception of the "nature-social" relations, which were based on the strict division between human society and the "living environment."[187] Throughout the using more and more energy, particularly from brown coal, they wanted to "create an environment" for the staffing needs of "socialist men." However, as the "Evaluation of the environment in Czechoslovakia" map prepared in 1989 for the Central Committee clearly shows, the further away from the coal mines and power stations, the better the environmental condition was (Figure 3).[188]

I claim that the massive skyrocketing of coal use aligned with this logic of the "techno-scientific revolution" (Figure 13). Thus, the sulphur dioxide emission increase was not an outcome of the unfortunate coincident of state socialism but rather the failure of the state socialist project based on the late industrial modernity production model, which saw unlimited growth of production and consumption as the desirable horizon and instrument for the constant creation of new "material and cultural needs" of socialist man and simultaneously their fulfilment. When failure resulted in the obvious crisis of "social-nature relations," communist technocrats had nothing better than continuous acceleration of the revolution in means of production. Instead of coal, they wanted to use the power of atoms, natural gas and supported this by "rationalizing" the production process or cleaning rest of coal power plants with filtration systems.

[187] For instance works of Zdeněk Lakomý, who was also the member of Richta's team at the Czechoslovak Academy of Science. Černý, Lakomý, and Nový, *Životní prostředí pro člověka*.

[188] *Vývoj a stav životního prostředí v ČSSR* [*Development and State of the Environment in the CSSR*], 1989, National Archive, KSČ - Ústřední výbor 1945-1989, item 123, 62.

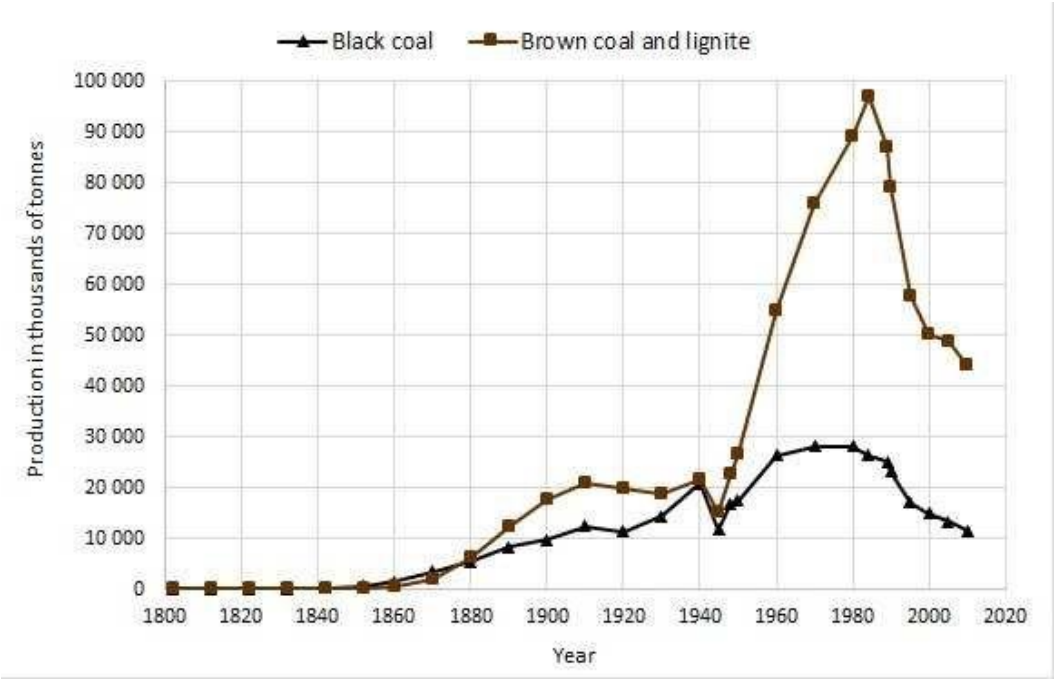


Figure 13 The rise and fall of coal mining in the Czech Republic. Stefan Bouzarovski, Martin J. Pasqualetti, and Vanesa Castán Broto, ed., *The Routledge Research Companion to Energy Geographies* (New York: Routledge, 2017), 204.

All these sources and solutions have crucial implications for socio-economic structure, and "social-nature relations"; the means of production to large extend shapes social and economic structures. Historian Andreas Malm shows it on the example of using coal and steam engines in 19th century England in the book *Fossil Capital.*[189] Malm describes how the replacement of water mills by steam engines affected society in England and elaborates on the changes that coal use and steam engines had on English society. The combination of the relative mobility of steam engines with the large deposits of coal, which was to the end of 18th century deforested England used primarily in households as a source of heat, gave owners of manufacturers fundamentally different possibilities in developing their production than older water mills which were spatially dependent on areas near rivers and river's irregular flows.

[189] Andreas Malm, *Fossil Capital:The Rise of Steam Power and the Roots of Global Warming* (London, New York: Verso, 2016), 121-163.

With the steam engines, the capitalists could relocate manufacturing closer to the workforce and became independent of the will of river owners. Also, the permanent and predictable energy output given by steam engines allowed them to make plans for production, distribution of foreign trade, or other actions within the market. Thus, Malm's interpretation of the Industrial Revolution has two layers: firstly, it is the source of energy from coal, which was in near large urban areas and revolutionized production, but secondly, it is also the structure of output itself that helped capitalists to maintain their businesses by allowing them to make labour market, establish foreign trades and stock markets, and so on. In the case of Czechoslovakia and the GDR, coal was used for centuries, and after the birth of the industrial revolution in the region, demists of coal became base for constructing large industrial bases, which was strategically crucial for the Austro-Hungarian Empire and Prussia, then also for Germany and Czechoslovakia. Since post-war reconstruction in the late 1940s, coal was put into the work by prominent and more significant infrastructures, which, throughout the following decades, the system of fossil fuel power plants and electric lines grew into the centralized network that supplied both country's citizens with heat and electricity mainly from lignite coal. The ecological crisis of the 1980s was thus the outcome of this infrastructural project of state socialist regimes, which was based on extensive use of fossil fuels and centralization. Almost all visions of "green modernization," maybe except the case of the governments of Schröder-Fischer and Modrow, were based on sustaining this large infrastructural project with its centralization and reliance on fossil fuels.

However, in the 1980s, the concept of "ecological modernization" emerged, developed by multiple environmental scientists worldwide. The shared foundation of this "ecological modernization theory," or what I called "green modernization," was the concern about:

> "…how human behaviour, capitalist institutions, a culture of mass consumption, failing governments and states, and industrial and technological developments, among others, contributed to the ongoing deterioration of the physical environment."[190]

From these concerns emerged in the 1970s a set of policies for compensating ecological degradation and restoring the environment, introducing technical pollution control and environmentally friendly technological innovations.[191] This strategy of "green modernization" was with relative success implemented in some Western countries and, in combination with the possibility of outsourcing "dirty" production to the peripheral countries, countries such as the German Federal Republic or France (with its sizeable nuclear program) became paradigmatic models of possibilities of western capitalist democracies to avoid air pollution and other environmental damage.[192] The Western model of ecological policies appeared more promising to technocrats in state socialist countries in the late 1980s despite ignoring production and consumption patterns between the capitalist core and its semi peripheries and peripheries.[193] Even after the fall of state socialism, "green modernization" remained a fundamental concept behind ecological policies. This is evident in the policies of the Moldan ministry and the governments of Klaus, Kohl, and Schröder. To summarize, the "green modernization" idea wants to protect the status quo in the socio-economic structure of a given society by introducing technologies and technocratic solutions, and state socialist and democratic capitalist regimes in Central Europe considered it an easy way of solving "ecological problems," whether it is sulphur emissions or the climate crisis.

[190] Arthur P.J. Mol, Gert Spaargaren, and David A. Sonnenfeld, "Ecological Modernization Theory: Taking Stock, Moving Forward", in Stewart Lockie, David A. Sonnenfeld, Dana R. Fisher, ed., *Handbook of Environmental Sociology* (London: Routledge), 15-30.

[191] Peter Christoff, "Ecological Modernisation, Ecological Modernities," *Environmental Politics - ENVIRON POLIT 5*, (1996), 476-500.

[192] See Milder, *Greening Democracy: The Anti-Nuclear Movement and Political Environmentalism in West Germany and Beyond, 1968–1983.*

[193] More about the concept of world-system, and peripheries and semi pheriperies in Immanuel Maurice Wallerstein, *World-systems analysis: an introduction* (Durham: Duke University Press, 2007).

As I have shown, technocrats and actors with expert backgrounds highly promoted modernization projects in Czech Lands and East Germany in the 1980s, as in the 1990s. It would be naïve to perceive the introduction of some technological solutions just because of the political decisions of regime leaders, whether it was the government of Štrougal or Kohl. For instance, the GDR's example of the lime additive process was highly demanding of resources, and experts in GDR continuously worked on developing the process and improving it from the 1950s. Despite the insufficient results of the lime additive process with the efficiency in sulphur dioxide capture of around 40 percent, the process was introduced in many power plants, and a milieu of expert knowledge was dependent on the continuation of this practice. Like the GDR, traditionally strong voices promote nuclear energy in Czechoslovak and Czech politics. The nuclear program, whether for peaceful use, was historically and still is run by the United States, the Soviet Union, the Russian Federation, France, and other superpowers that have an arsenal of nuclear weapons. Thus, the use of such energy by countries like Czechoslovakia, the Czech Republic, and Germany has international implications. The decision about constructing such sources is also geopolitical, as can be seen in the case of Temelín power, about which the Klaus government decided that the US Westinghouse would finish, and experts were not without opinion on these geopolitical questions.[194]

When considering the potential of technological innovations and technocratic solutions in preventing and addressing ecological damage, I do not doubt that large technocratic projects like constructing multiple nuclear power plants or implementing cybernetic methods in production systems to "rationalize" the economy can offer solutions to specific ecological issues. Overall, scientific and technological progress can contribute to addressing some fundamental problems. However, I want to emphasize that the decision to use such technocratic

[194] See Beránek, *Proč je třeba zastavit JE Temelín: historie, fakta a souvislosti projektu jaderné elektrárny Temelín*.

practices is ultimately a political decision residing in keeping the status quo of "social-nature relations" with its power structures, modes of living, exploitative production model, inequalities, and other social-economic relations, without change and thus risking delayed solutions precisely just as state socialism brought a solution only when large numbers of forest ecosystems were destroyed, and the health of many was ruined. It depends on the politics and governance of a society or political system. In line with this, I would like to pose the same question as Hannah Arendt does in *The Human Condition*:

> "The question is only whether we wish to use our new scientific and technical knowledge in this direction, and this question cannot be decided by scientific means; it is a political question of the first order and, therefore, can hardly be left to the decision of professional scientists or professional politicians."[195]

To delve deeper into this question, it is essential to provide a more detailed analysis of the political ecology of state socialism in the GDR and Czechoslovakia, democratic capitalism in the Czech Lands and Germany, and its historical implications.

3.1.3. Political Ecologies of State Socialism and Democratic Capitalism

Examining the roots of the collapse of relations between socio-economic structures and ecosystems in the 1980s and 1990s raises serious questions regarding the political ecology of regimes emerging in central Europe in the last two decades of the 20th century: How do state socialism and democratic capitalism work through nature, and how does nature, in turn, affect them? How is the mosaic of relations between human, social, and natural actors organized in these regimes?

[195] Hannah Arendt, *The Human Condition* (Chicago: University of Chicago Press, 1958), 3.

State socialist political ecology was based on the strong division of "nature" and "society." Natural ecosystems, with their energy and capacity to work in the form of growing plants, producing food or materials such as wood or raw resources, and all their networks were seen as the base for a socio-economic system aiming to increase "living standards" by producing consumer goods and accelerating consumption. Within this frame, it was justified to construct large infrastructure projects and put to work the natural energy of rivers, production capacities of forests and fields, mine and burn the rest of ancient plants to fuel power plants and heating systems to serve a "socialist mode of living." According to one of the most prominent Marxist philosophers of Czechoslovak state socialism, Ladislav Hrzal:

> "In the conditions of social ownership of the means of production, production is naturally and necessarily subordinated to ensuring better satisfaction of people's ever-increasing material and cultural needs. This causal connection in socialist production relations, expressed in the basic economic law of socialism, determines the content of the economic strategy, the main directions of economic activity of the Marxist-Leninist party and the socialist state."[196]

Out of this promise of "ever-increasing material and cultural needs" came the need to secure ever-increasing amounts of resources. As I described in the formulation of the broader civilizational dilemma of the late industrial modernity mass production system, this unstoppable increasing amount of goods and means of satisfaction brought GDR's and Czechoslovak state socialism into the trap of air pollution. And in the moment when it became evident that "nature" could not work harder and secure more production and economic performance, state socialist leaders did not reformulate the "basic law of socialism" but wanted to escape forward with innovations and green transformation policies. Thus, state socialist regimes organized the *web of life* to harness the reproductive forces of nature and its energetic

[196] Ladislav Hrzal, *Socialistický způsob života* [*The Socialist Mode of Living*] (Prague: Svoboda, 1978), 72.

and material capacities, with the goal of improving the "material and cultural" conditions of "socialist men" and, moreover, competing with the capitalist bloc during the Cold War.

By the late 1980s, the political ecology of state socialism became unsustainable, leading to the replacement of dictatorship regimes of communist parties with a transformation period and the establishment of so-called democratic capitalism. I argue that some fundamental characteristics of state socialist ecology persist or have been modified within the regime changes. These include the exploitation of resources, a division between nature and society, and a high pace of production and consumption, which has led to increasing depletion and decline of ecosystem capacities. Furthermore, these factors have contributed to broader crises with global consequences such as climate change and biodiversity loss. The "state socialist mode of living" was replaced by the adoption of the "imperial mode of living," which describes Ulrich Brand and Markus Wissen for the current socio-economic model of capitalist core:

> "…this mode of living affects and exacerbates – see above – worldwide crises such as climate change, the destruction of ecosystems, social polarization, widespread impoverishment, the destruction of local economies, and geopolitical tensions, which seemed until recently to have been overcome with the end of the Cold War."[197]

The inequalities between the global North and South also fuelled the imperial mode of living. A high level of consumption of an ever-growing number of goods and services in the "developed" countries is possible only because of the work of lower-income countries, their resources, and capacities. However, Hungarian sociologist Agnes Gagyi argues about the mode of production and consumption in the East-central Europe that:

> "One of the main problems of semi-peripheral development and governance has been constituted by that heterogeneity – like the coexistence of elements of the industrial revolution with forms of second serfdom, or of high-end consumption of

[197] Brand, and Wissen, *The Imperial Mode of Living: Everyday Life and the Ecological Crisis of Capitalism*, 29.

> Western brands with local production of the same brands under conditions characteristic to peripheral positions."[198]

Thus, Eastern Europeans in former Czechoslovakia and the GDR may have joined the capitalist system, but that happened unequally.[199] Despite the possibility of enjoying a Western level of consumption, their standards of living are fundamentally lower than those of their Western neighbours. However, that does not mean that the responsibilities for ecological crises are lower; in reality, since the transformation period, the Czech Republic has been using many policies, means of production, and sources of energy, which have been abandoned in the Western core. Political ecology in the transformation period changed in terms of who is achieving improvement.

At the core of this model is an idea that Jason W. Moore described as a "cheap nature." According to Moore, there are "four cheaps": labour-power, food, energy, and raw materials, which are divided along the division "humans" and "extra-humans," and these "extra-" could be appropriate by the capital as "free gifts" that are easily dedicated and exploited in order to fuel endeavours for endless accumulation of capital. Moore claims that:

> "In systemic terms, Cheap Nature is produced when the interlocking agencies of capital, science, and empire—blunt categories, yes—succeed in releasing new sources of free or low-cost human and extra-human natures for capital."[200]

The political ecology of capitalism, Moore claims, consists mainly of appropriating capacities of ecosystems, raw materials, and parts of the *web of life*. In the case of the 1990s Czech Republic and Germany, I claim that this approach towards "social-nature relations" is defended by the policies of "green transformation." The structure of highly centralized, fossil fuels-based energetic systems has persisted in both countries more or less until now, and

[198] Agnes Gagyi, *The Political Economy of Middle Class Politics and the Global Crisis in Eastern Europe: The case of Hungary and Romania* (Cham: Springer International Publishing, 2021), 82.

[199] Many levels of these inequalities are described, for instance, by Canadian historian Ivan Kalmar in Ivan Kalmar, *White But not Quite: Central Europe´s Illiberal Revolt* (Bristol: Bristol University Press, 2022).

[200] Jason W. Moore, *Capitalism in the web of life: ecology and the accumulation of capital,* 63.

endeavours for its replacement and reforming are in the form of hard political struggles not only on the national but also on the European level. However, snippets of this concept of "cheap nature" can be seen also in the political ecology of state socialism. Contrary to democratic capitalism, leaders of the dictatorship of SED and KSČ aimed to improve living standards, and capital accumulation came just with the transition in the 1990s. The state socialist regime employed highly centralized systems for mining, coal burning, and energy distribution. This involved extracting coal from underground, using it for economic purposes, and treating coal as a "free gift" of the "environment" despite its potential destructive impacts on the ecosystem, human health, and the climate. Nonetheless, as Moore also indicates, this approach of endless accumulation of "cheap nature" creates fundamental ruptures in the *web of life*, and the threat of collapse caused by growing pressure from the side of the capitalist system has emerged. As I showed on a much smaller scale – in dealing with the collapse of ecosystems in the Czech Lands and East Germany, I claim that the crucial question in addressing such issues is the legitimacy question: how to sustain legitimacy under the circumstances of ongoing ecological crises? In the last two subchapters, I briefly examine possible answers.

3.1.4. To Overcome the Dilemma: Question of Legitimacy

One of the key findings of my thesis is that governmental politics were too weak in the 1980s and 1990s to enforce significant changes in sulphur dioxide emissions. The main success came from East Germany and Czechoslovakia's joining the global market and capitalist production-consumption system, which may have resulted in the decrease of particular negative effects of sulphur dioxide and other pollutants, but the civilizational dilemma of late industrial modernity remains unresolved.

The situation that I described in the first chapter was clear. Leaders of state socialist regimes were well informed about the scope of the crisis and possible ends. In the 1980s, and especially at the end of the decade, they were prepared to adopt more active ecological policies,

but for many ecosystems, it was too late. Acid rains hardly struck forests on the mountain range alongside the GDR-Czechoslovak border, and many died during the following calamities. Their successors may have developed more active policies, and through these, they delivered needed improvements in the emissions of sulphur dioxide and other emergent pressures on ecosystems. Nevertheless, they offered just protection of the *status quo*, which was sustainable by the variety of policies from introducing innovations, setting limits on mining and pollution, outsourcing emissions and "dirty" production and deindustrialization. After a few decades, the ecological consequences of exploitative "social-nature relations" of democratic capitalism in the Czech Republic and Germany, which shared continuities with the previous epoch, resulted in the ongoing climate and biodiversity crises. The inability to offer more remarkable structural change consists, for instance, of the decentralization of an energetic supply system, phase-out of fossil fuels, and establishment of an economic production model alongside satisfying basic needs instead of continuously creating more and more "material and cultural" needs, resulting in the situation of return of environmental crises, which are comparably threatening and potentially even more destructive than the crisis of the late 1980s.

I claim that this inability was caused by the fear of political leaders and politics from the economic sphere. Politicians' protection of the self-movement of the production and consumption model was given by the legitimacy model among the public, which was based on the promise of ever-growing living standards, and the same after 1989. The "green modernization" strategy then was seen and is still considered by political leaders as the only possible way to avoid severe impacts of harming the *web of life* and sustain the growing flow of goods and services towards the population. To overcome this civilizational dilemma, the leaders of state socialism, decision-makers, and the political arena in democratic capitalism would need to establish a new model of legitimacy based on values different from those of ever-growing consumption.

It is not the question for this thesis how exactly such a new legitimacy can be maintained. This could involve building communities, creating parallel infrastructures for producing energy and food, and satisfying basic needs, or also significant state interventions and centralized investment projects. However, it is essential to find new ways of gaining legitimacy to address the dilemma of productivist projects of late industrial modernity and, by that, prevent a fundamental change in climate conditions and the collapse of the current *web of life*. One of the possible ways of maintaining such an alternative is an enormous scope of new literature, proposed policies, and strategies that want to go beyond the promise of never-ending growth of the economy and establish socio-economic relations on the new fundament of satisfying some basic needs besides respecting boundaries given by the reproductive forces of ecosystems, and also the planetary climate system itself. Regarding this, the Intergovernmental Panel on Climate Change, which represents scientific consensus on climate change, already claims:

> "There is strong evidence and high agreement in the literature that human well-being and related metrics provide a societal perspective that is inclusive, compatible with sustainable development, and generates multiple ways to mitigate emissions. Development targeted to basic needs and well-being for all entails less carbon intensity than GDP-focused growth."[201]

Without the practice, gain of support, and broadening of social projects embedded in such visions, plans for a good life within ecosystem and planetary boundaries remain "past futures," the same as the technocratic visions of state socialist leaders.

[201] Felix Creutzig, and Joyashree Roy, ed., *Demand, services and social aspects of mitigation*, in IPCC, *Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* (Cambridge University Press, Cambridge, UK and New York, NY, USA, 2022), 512.

3.1.5. Conclusion: Three Theses

From these research outcomes, I formulate three theses, which also answer the main research question of my thesis: How can the political ecology of state socialism and democratic capitalism regimes in Central Europe be characterized?

Firstly, the political ecology of state socialist regimes and democratic capitalist ones share many similarities, mainly in their exploitative approach towards the ecosystem, its capacities, and energy. Ultimately, they aimed to put large and large parts of the *web of life*, particularly lignite coal, to work to sustain ever-growing production and consumption systems.

The second thesis regards "green modernization." Because the fossil economy has accelerated, pressure on the ecosystems has emerged, and Czechoslovakia and the GDR have found themselves in the middle of an ecological crisis. The leaders of state socialism introduced several policies to keep the production system and political ecology without significant changes and simultaneously decrease the burden on "nature." With the persistence of this situation, new governments after 1989 had to deal with the crisis and, in wide varieties, adopted several ecological policies, which can be, despite some differences, characterized as policies of "green modernization": through the innovations, "rationalization" or "ecologization" of the economy, and increasing of the economic performance, the governments wanted to achieve "harmony" between "nature" and "society."

The third thesis addresses the issue of legitimacy. It is paradoxical that a state socialist dictatorship, which was expected to have unlimited power, did not dare to accept fundamental changes even when environmental problems demanded it. Instead of such an active and transformative attempt, they continue to mine and burn coal excessively to sustain extensive production and consumption processes. They should pursue an alternative project that could address the causes of the crisis and overcome the dilemma by developing different socio-economic structures which would focus on respecting ecosystem capabilities and ensuring the

population's basic needs. In the moment of implosion of state socialism, the chance for such transformation came. However, new democratic regimes prioritized economic transformation towards a free market, privatization, and neoliberal policies with a strong nationalist element. This regime continued in the state socialist policies on "green modernization" and the political ecology of pre-1989 regimes. The alternative, established after 1989, was just a partial one.

CONCLUSION

The issue of air pollution and the crisis caused by it were not just unfortunate coincidences. Throughout the thesis, I showed that it was more about the conscious decisions that emerged from the domineering political ecology and relations towards the ecosystems, material resources, and citizens of Czech Lands and East Germany. This conception of nature, which is there just for the delivery of larger economic performance, no matter for whom, is one of the leading causes of the ecological crisis of the 1980s.

In this thesis, the reader can observe the story of two unsuccessful regimes, dictatorships of SED and KSČ that were unable to meet commitments regarding the growth of living standards defined by the growth of production and consumption. Now, German governments, as well as their neighbours in the Czech Republic, have recently made a promise and are trying their best to avert the most destructive outcomes of the ecological crisis of our days – biodiversity loss and climate crises. This thesis describes how German and Czech societies came to this situation.

The thesis primarily focuses on the governmentality of political leaders of that time. I analysed their plans, visions, and future horizons, as well as their decisions regarding addressing specific issues of ecological crises. Thus, the thesis did not directly provide a data-based evaluation of the effectiveness of each policy. I clearly noted that such research needs to be done. However, as mentioned in the introduction, analysing the expectations of decision-makers, experts, and leading figures of society in the past and thinking about their decisions can help prepare us for our own choices in the future.

One of my main aims was to go beyond the classic liberal Fukuyama's narrative that state socialism was a spectacular failure, and therefore, capitalism and liberal democracy have to be only possible way to the future.[202] Instead of that, I described how modern society can come to

[202] Francis Fukuyama, *The End of History and the Last Man* (New York: The Free Press, 1992).

the tragic situation of dilemma in which is trapped without any horizons what should be done next, and without enough political power to find way out of the dilemma. Even though in the 1990s and in recent research, state socialist regimes were blamed for insufficient ecological policies and the inability to avert ecological collapse. Authors such as Miroslav Vaněk or even post-1989 politician Josef Vavroušek connect the bad state of the environment to "totalitarianism." [203] The memory of state socialism is often associated with images of polluted air, deforested landscapes, urban smog, and poor living conditions. However, it is important to remember that in Czechoslovakia and the GDR, this era also saw the construction of large infrastructure projects and the establishment of a fossil fuel-based production model, which made it possible to improve living standards. In my research, I described how leaders of state socialist regimes responded to the threat of collapse of the ecosystem and potentially the *web of life*, and I indicated that these regimes and their leaders did not want to have a ruined environment in their countries, but rather they were trapped in a dilemma. I think that describing that time's complexity and tragic paradoxes is much more helpful for our orientation in today's crises than the heroic narrative about post-socialist environmentalists and irresponsible "totalitarian regimes."

However, in the face of the current climate and biodiversity crises, it's no longer feasible to view state socialism just as a failure. With the ongoing climate and biodiversity loss crisis, this memory and understanding of state socialism as a failure are no longer possible. Yes, state socialism failed to find ways from the civilizational dilemma and caused a severe ecological crisis. However, are new regimes not facing the same dilemma? Have they found a way out of it? After reviewing all sources regarding the politics of industrial air pollution in the 1980s and

[203] In the *Návrh zásad státní ekologické politiky* Vavroušek blamed "totalitarian regime" for bad state of environment. See Josef Vavroušek ed., *Návrh zásad státní ekologické politiky*, Czech National Archive, 1. Miroslav Vaněk also partially worked with the presumption that the communist regime was inheritably lacking the capacity to solve ecological crises. See Vaněk, *Nedalo se tady dýchat.*

1990s, I am deeply concerned that the failures of state socialist apparatchiks might indicate our potential future failures. The conclusion of my thesis from the research can be expressed by the question: What if we are closer to the past than we would like?

BIBLIOGRAPHY AND SOURCES

Primary Sources

Archival Documents

Bundesarchiv [Federal Archive], Germany

Bundesamt für Naturschutz, Archivfonds [Federal Agency for Nature Conservation Fund]
Büro Günter Mittag im ZK der SED, Archivfonds [Günter Mittag Office in the Central Committee of the SED Fund]
Generaldirektor, Archivfonds [Director General Fund]
Institut für Umweltschutz, Archivfonds [Institute for Environmental Protection Fund]
Meteorologischer Dienst der DDR, Archivfonds [Meteorological Service of the GDR Fund]
Ministerium für Kohle und Energie, Archivfonds [Ministry for Coal and Energy Fund]
Ministerium für Umweltschutz und Wasserwirtschaft, Archivfonds [Ministry of Environmental Protection and Water Management Fund]
Ministerrat der DDR, Archivfonds [Council of Ministers of the GDR Fund]
Staatliche Plankommission, Archivfonds [State Planning Commission Fund]

Národní archiv [National Archive], Czech Republic

Fond KSČ - Ústřední výbor 1945-1989 [KSČ – Central Committee 1945-1989 Fund]
Fond Ministerstva životního prostředí [Ministry of the Environment Fund]
Fond Úřadu vlády ČR [Czech Governmental Office Fund]
Fond Výboru lidové kontroly [People's Control Committee Fund]

Online Primary Sources

Bundeszentralle für politische Bildung. "Umwelt." Last modified May 24, 2024, https://www.bpb.de/themen/deutsche-einheit/lange-wege-der-deutschen-einheit/47350/umwelt/#node-content-title-3.

Deutsche Bundestag. "Das energiepolitische Gesamtkonzept der Bundesregierung Energiepolitik für das vereinte Deutschland" ["The Federal Government's overall energy policy concept Energy policy for a united Germany"]. Last modified June 3, 2024. https://dip.bundestag.de/vorgang/das-energiepolitische-gesamtkonzept-der-bundesregierung-energiepolitik-f%C3%BCr-das-vereinte-deutschland/137906.

Deutsche Bundestag. "Energiepolitik für das 21. Jahrhundert - Energiekonzept der Bundesregierung für den Ausstieg aus der Kernenergie" ["Energy policy for the 21st century - the German Government's Energy Concept for Phasing out Nuclear Energy"]. Last modified June 3, 2024. https://dip.bundestag.de/vorgang/energiepolitik-f%C3%BCr-das-21-jahrhundert-energiekonzept-der-bundesregierung-f%C3%BCr/102305.

Friedrich-Ebert-Stiftung. "Koalitionsvereinbarungen der SPD auf Bundesebene." Last modified June 3, 2024, https://www.fes.de/bibliothek/koalitionsvereinbarungen-der-spd-auf-bundesebene.

Vláda České republiky. "Programové prohlášení vlády [Government Programme Statement] - Vláda Václava Klause I. (2. 7.1992 – 4. 7. 1996)." Last modified May 24, 2024. https://vlada.gov.cz/scripts/detail.php?id=26624.

Glasnost – archive. “Regierungserklärung am 17. 11. 1989” [“Government’s Statement 17. 11. 1989”]. Last modified May 24, 2024, http://www.glasnost.de/hist/ddr/89regerkl.html.

Vláda České republiky. “Vláda Petra Pitharta (29. 6. 1990 – 2. 7. 1992)” [“Petr Pithart’s Government ((29. 6. 1990 – 2. 7. 1992)”]. Last modified May 24, 2024. https://vlada.gov.cz/cz/clenove-vlady/historie-minulych-vlad/prehled-vlad-cr/1990-1992-csfr/petr-pithart/prehled-ministru-24626/.

AION CS 2010–2024. “Zákony pro lidi.cz.” Last modified June 3, 2024. https://www.zakonyprolidi.cz/cs/1985-114.

kormoran.vlada.cz. “Dokumenty vlády.” Last modified June 3, 2024. https://kormoran.vlada.cz/usneseni/usneseni_webtest.nsf/0/7DCED4838DD30F36C12571B6006B9ABD.

Published Primary Sources

Beránek, Jan V., ed. *Proč je třeba zastavit JE Temelín: historie, fakta a souvislosti projektu jaderné elektrárny Temelín* [*Why the Temelín nuclear power plant must be stopped: history, facts and background of the Temelín nuclear power plant project*]. Brno: Hnutí Duha - Přátelé Země ČR, 1997.

Černý, Miloš, Zdeněk Lakomý, and Otakar Nový. *Životní prostředí pro člověka* [*Living Environment for Humans*]. Prague: Academia, 1973.

Císařovská, Blanka, and Vilém Prečan ed. *Charta 77: Dokumenty 1977-1989* [*Charter 77: Documents 1977-1989*]. Prague: Insitute for Contemporary Hisotry, 2007.

Dreher, Marion, ed. *Übersicht zur Entwicklung der energiebedingten Emissionen und Brennstoffeinsätze in Deutschland 1990-2017 unter Verwendung von Berechnungsergebnissen der Nationalen Koordinierungsstelle Emissionsberichterstattung* [*Overview of the development of energy-related emissions and fuel use in Germany 1990-2017 using calculation results from the National Coordination Centre for Emissions Reporting*]. Umweltbundesamt, 2019.

Gransow, Volker, and Konrad Jarausch ed. *Die Deutsche Vereinigung: Dokumente zu Bürgerbewegung, Annäherung und Beitritt* [*German Reunification: Documents on the Citizens’ Movement, Rapprochement, and Accession*]. Cologne: Verlag Wissenschaft und Politik, 1991.

Holý Miloš, Josef Říha, and Josef Sládek. *Společnost a životní prostředí* [*Society and Environment*]. Prague: Svoboda, 1975.

Honecker, Erich. *Bericht des Zentralkomitees der Sozialistischen Einheitspartei Deutschlands an den X. Parteitag der SED: X. Parteitag der Sozialistischen Einheitspartei Deutschlands; April 1981 in Berlin* [*Report of the Central Committee of the Socialist Unity Party of Germany to the X. Party Congress of the SED: X. Party Congress of the Socialist Unity Party of Germany; April 1981 in Berlin*]. Dresden: Zeit im Bild, 1981.

Hrzal, Ladislav. *Socialistický způsob života* [*The Socialist Mode of Living*]. Prague: Svoboda, 1978.

Juláková Jiřina, and Josef Vavroušek. *Zpráva o stavu životního prostředí v ČSFR* [*Report on State of Environment in CSFR*]. Praha: Vesmír, 1991.

Kahlert, Joachim. *Die Energiepolitik der DDR. Mängelverwaltung zwischen Kernkraft und Braunkohle* [*The energy policy of the GDR. Managing deficiencies between nuclear power and lignite*]. Bonn: Verlag Neue Gesellschaft, 1988.

KSČ. ÚV. *14. zasedání Ústředního výboru Komunistické strany Československa ve dnech 14. a 15. června 1989* [*14th Session of the Central Committee of the Communist Party of Czechoslovakia on 14 and 15 June 1989*]. Prague: Svoboda, 1989.

KSČ. ÚV. *15. zasedání Ústředního výboru Komunistické strany Československa ve dnech 11. a 12. října 1989* [*15th Session of the Central Committee of the Communist Party of Czechoslovakia on 11 and 12 October 1989*]. Prague: Svoboda, 1989.

Lakomý, Zdeněk, *Člověk mění svět: civilizace, kultura a životní prostředí* [*Humans are changing the World: Civilisation, Culture and the Environment*]. Prague: Odeon, 1976.

Marx, Karl. *Economic and Philosophic Manuscripts of 1844*. New York: Dover Publications, 2007.

Meadows, Donella, et al., *The Limits to Growth: A Report for the Club of Rome's Project on the Predicament of Mankind*. New York: Universe Books, 1972.

Moldan, Bedřich, and Vladimír Jiránek. *Ekologie, demokracie, trh* [*Ecology, democracy, market*]. Prague: Ministery of Environment, 1992.

Moldan, Bedřich. *Duhový program: program ozdravení životního prostředí České republiky* [*The Rainbow Programme: Programme for the Environmental Recovery of the Czech Republic*]. Prague: Academia, 1991.

Pithart, Petr. *Devětaosmdesátý: vzpomínky a přemýšlení: krédo* [*Eighty-nine: memories and reflections: a credo*]. Prague: Academia, 2009.

Richta, Radovan, ed. *Civilization at the Crossroads: Social and Human Implications of the Scientific and Technological Revolution*. International Arts and Sciences Press, Year: 1969.

Sborník hlavních dokumentů 17. sjezdu Komunistické strany Československa: 24. března - 28. března 1986 [*Proceedings of the 17th Congress of the Communist Party of Czechoslovakia: 24 March - 28 March 1986*]. Prague: Svoboda, 1986.

Secondary Literature

Andělová, Kristina. "Existoval Chartistický environmentalismus? Charta 77 a reflexe životního prostředí" ["Did Chartrist Environmentalism Exist? Charterer 77 and Environmental Reflection"]. *Soudobé dějiny* 30, no. 2, (2023): 351-384.

Arendt, Hannah. *The Human Condition*. Chicago: University of Chicago Press, 1958.

Berghoff, Hartmut, and Uta A. Balbier, ed. *The East German Economy, 1945-2010: Falling Behind or Catching Up?* Cambridge: Cambridge University Press, 2014.

Bockman, Johanna, and Gil Eyal. "Eastern Europe as a Laboratory for Economic Knowledge: The Transnational Roots of Neoliberalism." *American Journal of Sociology* 108, no. 2 (2002): 310–52.

Borewicz, Tomasz, Kacper. Szulecki, and Janusz Waluszko. *The Chernobyl Effect: Antinuclear Protests and the Molding of Polish Democracy, 1986-1990*. New York: Berghahn Books, 2022.

Bouzarovski, Stefan, Martin J. Pasqualetti, and Vanesa Castán Broto, ed. *The Routledge Research Companion to Energy Geographies*. New York: Routledge, 2017.

Brand, Ulrich, and Markus Wissen, *The Imperial Mode of Living: Everyday Life and the Ecological Crisis of Capitalism*. London, New York: Verso, 2021.

Brand, Ulrich, and Markus Wissen, *The Limits to Capitalist Nature: Theorizing and Overcoming the Imperial Mode of Living*. London: Rowman & Littlefield, 2018.

Breivik, Knut, Rosalinda Gioia, Paromita Chakraborty, Gan Zhang, and Kevin C. Jones, "Are Reductions in Industrial Organic Contaminants Emissions in Rich Countries Achieved Partly by Export of Toxic Wastes?" *Environmental Science & Technology* 2011, no 45 (21): 9154-9160.

Cederlöf, Gustav. *Discovering political ecology*. Abingdon, England: Routledge, 2024.

Chari, Sharad, and Katherine Verdery. “Thinking between the Posts: Postcolonialism, Postsocialism, and Ethnography after the Cold War.” *Comparative Studies in Society and History 51*, no. 1 (2009).

Chasek, Pamela, and Lynn M. Wagner, ed. *The Roads from Rio: Lessons Learned from Twenty Years of Multilateral Environmental Negotiations*. New York: RFF Press, 2012.

Christoff, Peter “Ecological Modernisation, Ecological Modernities.” *Environmental Politics - ENVIRON POLIT* 5, (1996): 476-500.

Čížová, Júlia and Michal Ďurčo. “Pozitívna deviácia v Československu v 80. rokoch: Prípad bratislavského environmentálneho hnutia” [“Positive Deviance in 1980s Czechoslovakia: The Case of the Bratislava Environmental Movement”]. *Historický časopis* 70, 3, (2022): 461–486.

Dupuy, Michel. “Justifying Air Pollution in the GDR 1949-1989.” In *Ecologies of Socialisms: Germany, Nature, and the Left in History, Politics, and Culture* , edited by Sabine Mödersheim, Scott Moranda, Eli Rubin, and Peter Lang. Oxford Wien: Peter Lang, 2019.

Gagyi, Agnes, and Ondřej Slačálek, ed. *The Political Economy of Eastern Europe 30 Years into The ‘Transition.’* Switzerland: Springer International Publishing, 2021.

Gagyi, Agnes. *The Political Economy of Middle Class Politics and the Global Crisis in Eastern Europe: The case of Hungary and Romania*. Cham: Springer International Publishing, 2021.

Gross, Stephen G. *Energy and power: Germany in the age of oil, atoms, and climate change*. New York: Oxford University Press, 2023.

Grote, Karl-Heinrich, and Jörg Feldhusen. *Dubbel Taschenbuch für den Maschinenbau*. Springer-Verlag, 2011.

Halbrock, Christian. “Die Unabhängigen Umweltgruppen in der DDR. ‘Zwischenstand’ nach zwei Jahrzehnten Aufarbeitung.” *Zeitschrift für Evangelische Ethik* 54, no. 3 (Gütersloher Verlagshaus, 2013).

Heinrich, Michael. *An Introduction to the Three Volumes of Karl Marx’s Capital*. New York: Monthly Review Press, 2012.

Herles, Helmut, and Edmunt Rose ed. *Vom Runden Tisch zum Parlament* [*From round table to parliament*]. Bonn: Bouvier, 1990.

Heydemann, Gunther, and Detlev Brunner. *Die Einheit und die Folgen: eine Geschichte Deutschlands seit 1990* [*Unity and its Consequences: A History of Germany since 1990*]. Bonn: Bundeszentrale für politische Bildung, 2021.

Hilmar, Till. *Deserved: Economic Memories After the Fall of the Iron Curtain.* Columbia University Press, 2023.

Huff, Tobias. “Environmental Policy in the GDR: Principles, Restrictions, Failure, and Legacy.” In *Ecologies of Socialisms: Germany, Nature, and the Left in History, Politics, and Culture*, edited by Sabine Mödersheim, Scott Moranda, Eli Rubin, and Peter Lang. Oxford Wien: Peter Lang, 2019.

Huff, Tobias. *Natur und Industrie im Sozialismus: Eine Umweltgeschichte der DDR* [*Nature and Industry under Socialism: An Environmental History of the GDR*]. Vandenhoeck & Ruprecht, 2015.

IPCC. *Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge University Press, Cambridge, UK and New York, NY, USA, 2022.

IPCC. *Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*. IPCC, Geneva, Switzerland, 2023.

Janáč, Jiří, and Doubravka Olšáková. *The Cult of Unity: The Stalin Plan for the Transformation of Nature in Czechoslovakia 1948-1964*. Prague: Academia, 2021.

Jehlička, Peter, and Joe Smith. "Trampové, přírodovědci a brontosauři: Předlistopadová zkušenost českého environmentálního hnutí jako předzvěst ekologické modernizace." ["Tramps, environmentalists and brontosaurs: The Pre-November Experience of the Czech Environmental Movement as a Precursor to Ecological Modernization"]. *Soudobé dějiny*, 24, no. 1-2 (2017): 78-101.

Kalmar, Ivan. *White But not Quite: Central Europe's Illiberal Revolt*. Bristol: Bristol University Press, 2022.

Kolář, Pavel, and Michal Pullmann. *Co byla normalizace?: studie o pozdním socialismu* [*What was normalisation?: a study of late socialism*]. Prague: Nakladatelství Lidové noviny, 2016.

Kopeček, Michal, et al. *Architekti dlouhé změny: expertní kořeny postsocialismu v Československu* [*Architects of Long Change: the expert roots of post-socialism in Czechoslovakia*]. Prague: Argo, 2019.

Koselleck, Reinhart. *Vergangene Zukunft: zur Semantik geschichtlicher Zeiten* [*Futures Past: On the Semantics of Historical Times*]. Frankfurt am Main: Suhrkamp, 1992.

Krapfl, James. *Revolution with a human face: politics, culture, and community in Czechoslovakia, 1989-1992*. Ithaca: Cornell University Press, 2013.

Kratinová, Alžběta. *Dovolená s poukazem: odborové rekreace v Československu 1948-1968* [*Holidays with a Voucher: Trade Unions Recreation in Czechoslovakia 1948-1968*]. Prague: Academia, 2014.

Latour, Bruno. *Down to Earth: Politics in the New Climatic Regime*. England: Polity Press, 2018.

Latour, Bruno. *Facing Gaia: Eight Lectures on the New Climatic Regime*. Cambridge, United Kingdom: Polity Press, 2017.

Lindenberger, Thomas. "Unfit for Comparison? East German State Socialism as a "Case" of Industrial Society." *Divinatio*, 44, (2017): 165-178.

Lockie, Stewart, David A. Sonnenfeld, Dana R. Fisher, ed. *Handbook of Environmental Sociology*. London: Routledge, 2021.

Malm, Andreas. *Fossil Capital: The Rise of Steam Power and the Roots of Global Warming*. London, New York: Verso, 2016.

McDermott Hughes, David. *Who Owns the Wind?: Climate Crisis and the Hope of Renewable Energy*. Verso Books, 2021.

Milder, Stephen. "From Tinkerers to Consultants: Individual Engagement, Reunification and the Making of Germany's Renewable Energy Sector." *Global Environment* 17, no. 1 (2024).

Milder, Stephen. *Greening Democracy: The Anti-Nuclear Movement and Political Environmentalism in West Germany and Beyond, 1968–1983*. Cambridge University Press, 2017.

Möller, Christian. *Umwelt und Herrschaft in der DDR: Politik, Protest und die Grenzen der Partizipation in der Diktatur*. Göttingen: Vandenhoeck & Ruprecht, 2019.

Moore, Jason W. *Capitalism in the web of life: ecology and the accumulation of capital*. London: Verso, 2015.

Myant, Martin. *The rise and fall of Czech capitalism: economic development in the Czech Republic since 1989*. Cheltenham: Edward Elgar, 2003.

Pál, Viktor. "Trouble with the Bottle Beverage Containers and the Widening Waste Crisis in Socialist Hungary." *Journal of contemporary history* 59, no. 2 (2024): 293-312.

Pál, Viktor. *Technology and the Environment in State-Socialist Hungary: An Economic History*. Cham: Springer International Publishing, 2017.

Panjabi, Ranee K. L. *The Earth Summit at Rio: Politics, Economics, and the Environment*. Northeastern University Press, 1997.

Parfianowicz, Weronika. "Limits to Socialist Growth: The Question of Economic Growth and Environmental Crisis in Polish Discussions of the 1970s." *Contradictions* 6, no. 2 (2022): 41-66.

Pullmann, Michal. "Social History and the Totalitarian-History Narrative." *Soudobé dějiny/CJCH* 15, no. 3-4 (2008): 703-717.

Rameš, Václav. *Trh bez přívlastků, nebo ekonomickou demokracii? Spory o podobu vlastnické transformace v porevolučním Československu* [*Market without Adjectives or Economic Democracy? Disputes over the Form of Ownership Transformation in post-revolutionary Czechoslovakia*]. Prague: Ústav pro soudobé dějiny AV ČR, 2021.

Richardson, Katherine, Will Steffen, Wolfgang Lucht, Jørgen Bendtsen, Sarah E. Cornell, Jonathan F. Donges, Markus Drüke, et al. "Earth beyond six of nine planetary boundaries." *Science advances*, 9, 37 (2023).

Robbins, Paul. *Political ecology: a critical introduction*. Chichester: Wiley-Blackwell, 2012.

Rosencranz, Armin. "The ECE Convention of 1979 on Long-Range Transboundary Air Pollution." *The American Journal of International Law* 75, no. 4 (1981): 975–82.

Sabrow, Martin. "Socialism as Sinnwelt: The Communist Dictatorship from the Perspective of Cultural History." *Soudobé dějiny/CJCH* 19, no. 2 (2012): 196-208.

Sommer, Vítězslav, Matěj Spurný, and Jaromír Mrňka. *Řídit socialismus jako firmu: technokratické vládnutí v Československu, 1956-1989* [*Running Socialism Like a Private Company: Technocratic Governance in Czechoslovakia, 1956-1989*]. Prague: Insitute for Contemporary History, Czech Academy of Science, 2019.

Spurný, Matěj. *Making the Most of Tomorrow: a Laboratory of Socialist Modernity in Czechoslovakia*. Prague: Karolinum Press, 2019.

Steinbach, Walter Christian. *Eine Mark für Espenhain: Vom Christlichen Umweltseminar Rötha zum Leipziger Neuseenland* [*A marrow for Espenhain: From the Rötha Christian Environmental Seminar to the Leipzig New Lake District*]. Leipzig Evangelische: Verlagsanstalt, 2019.

Stoddard, Isak, Kevin Anderson, Stuart Capstick, Wim Carton, Joanna Depledge, Keri Facer, Clair Gough, et al. "Three Decades of Climate Mitigation: Why Haven't We Bent the Global Emissions Curve?" *Annual review of environment and resources*, 46, 1 (2021): 653-689.

Suk, Jiří. *Labyrintem revoluce: aktéři, zápletky a křižovatky jedné politické krize: (od listopadu 1989 do června 1990)* [*Through the Labyrinth of Revolution: Actors, Plots and Crossroads of a Political Crisis: (November 1989 to June 1990)*]. Prague: Prostor, 2009.

Szulecka, Julia, and Kacper Szulecki, "Between domestic politics and ecological crises: (De)legitimization of Polish environmentalism." *Environmental politics*, 31, 7 (2022), 1214-1243.

Ther, Philipp. *Das andere Ende der Geschichte: über die Große Transformation* [*The Different Ends of History: About the Great Transformation*]. Berlin: Suhrkamp, 2019.

Uekötter, Frank. *Umweltgeschichte im 19. und 20. Jahrhundert* [*Environmental history in the 19th and 20th centuries*]. München: Oldenbourg Wissenschaftsverlag, 2007.

Vaněk, Miroslav. *Nedalo se tady dýchat: ekologie v českých zemích v letech 1968 až 1989* [*It was impossible to breathe here: ecology in the Czech lands between 1968 and 1989*]. Prague: Maxdorf, 1996.

Wallerstein, Immanuel Maurice. *World-systems analysis: an introduction*. Durham: Duke University Press, 2007.

Wang, Feng, Yongyuan Li, Wei Zhang, Pan He, Ling Jiang, Beiming Cai, Jing Zhang, Pengyan Zhang, Haoran Pan, Hongqiang Jiang. "China's trade-off between economic benefits and sulphur dioxide emissions in changing global trade." *Earth's Future* (2020).