



Original research article

What's next for the European coal heartland? Exploring the future of coal as presented in German, Polish and Czech press



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ABSTRACT

This article addresses the future of coal in the European coal heartland, i.e. in the area of Germany, Poland and the Czech Republic, which together account for nearly 57% of coal consumption and 87% of coal-mining jobs in the EU. It approaches the problem within the interpretative tradition of social research and explores the coverage of the future of coal in major newspapers and political magazines in the three countries. The results show that despite similar material conditions, the issue is presented in a fundamentally different manner as the media tend to follow the dominant energy policy paradigm in their countries: in Germany, they facilitate the phase-out policies; in Poland, they act as an inhibiting factor; while in the Czech Republic, their coverage echoes the political uncertainty around lignite mining in the northwest part of the country. The results also suggest that the media act mainly as a platform for the countries' decision makers and energy policy stakeholders to voice their perspectives. The prevalent media coverage thus simultaneously enable and constrain policy options by promoting dominant discourses and preventing alternative views from surfacing.

1. Introduction

The energy industry accounts for 42% of global greenhouse gas emissions [1]. In the EU, fossil fuel combustion (excluding transport) is responsible for 55% of emissions [2]. Despite a continuous decrease in the use of coal, the most GHG-intensive fossil fuel, it still accounts for nearly 19% of the EU's total primary energy supply [3], 25% of electricity generation and more than 26% of gross derived heat production [4]. Substituting coal with a more environmentally sustainable energy source(s) thus appears to be the next important step in decarbonizing the energy industry and, hence, mitigating global climate change. While some European countries have already eliminated coal from the energy mix (Belgium) or taken the decision to phase coal out of electricity generation no later than 2025 (Austria, France, Ireland, Italy, Sweden, and the UK), the countries of the European coal heartland, Germany, Poland and the Czech Republic, who together account for nearly 57% of the Union's coal consumption [5], remain reluctant to such ambitious pledges, even though a Government Commission in Germany recently recommended a coal phase-out by 2038 [6].

The roots of such position are often traced to the material importance of coal in a country's energy system [7–11]; the socioeconomic dynamics in its coal-producing regions [12,13]; or the ideas and perceptions regarding the role of coal in the nation's energy system, national economy and national story-telling [14–16]. These “ideational”

factors are the primary focus of this article. The presented research focuses on media, a crucial sphere in the formulation of political agenda [17]. More specifically, it explores the media coverage of the future of coal in the three countries and compares and discusses commonalities and differences among them. This comparison establishes the foundation to foster our understanding of the choices being made and pathways being considered in governing this critically important industry.

The research follows two concrete objectives. The primary objective of the presented research is to explore media coverage of the future of coal in major print media in the selected countries. The research is informed by the “second-order” iteration of the agenda-setting concept concerned with the question of how issues are portrayed in the media [18]. The research questions capturing the objective are as follow:

- RQ1: Which attributes of the coal issue do articles dealing with its future highlight?
- RQ2: What is the salience of these attributes?
- RQ3: What storyline patterns are employed by the media when referring to these attributes?

The secondary objective consists in outlining the consequences of the identified structure of media coverage for the countries' policy-making. Here, the article seeks to build new hypotheses by linking the results of the exploration with secondary literature on media effects.

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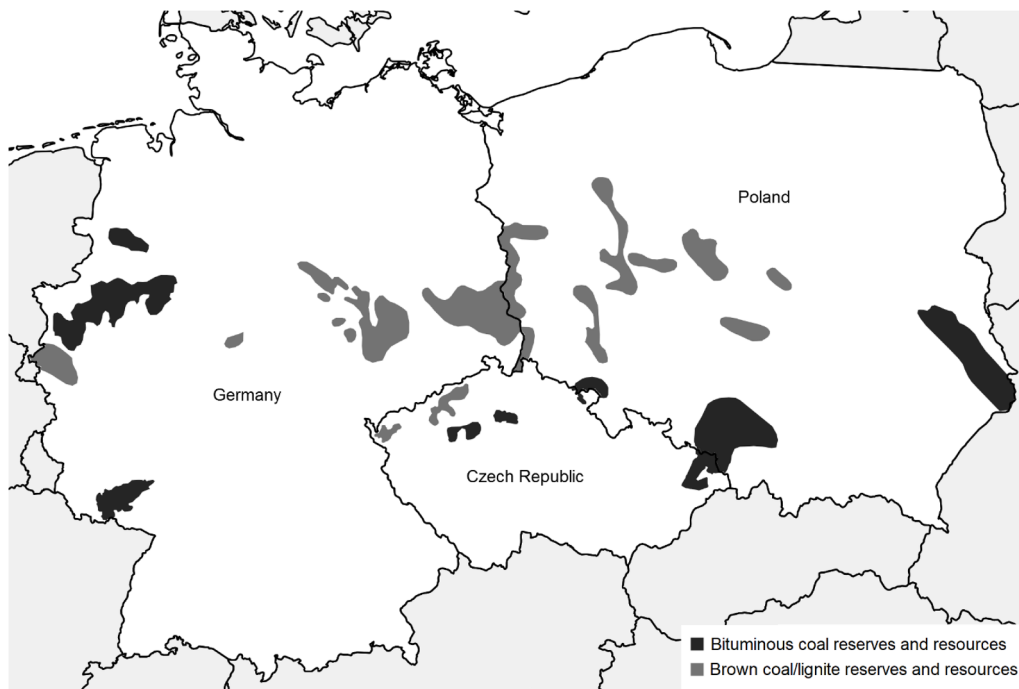


Fig. 1. The coal heartland
Source: adapted from [101–103].

The interpretation draws mainly on the work by Takeshita [19] and Iyengar and Kinder [20], who highlight the importance of media content for the formation of public opinion and political agendas. The research question stemming from this objective is as follows:

RQ4: What political implications does the media coverage have for the future of coal in the region?

2. The coal heartland: background

In all three countries coal has traditionally served as the backbone of industrial development. In recent years, however, coal has come under pressure as climate and environmental concerns have made its further use politically questionable [21]. Furthermore, hard coal producers faced a sharp decline in prices in the 2011–2016 period, which resulted in bankruptcies of the largest coal mining companies in Poland and the Czech Republic (Kompania Weglowa and OKD, respectively) [22]. In Germany, this price decline coincided with the phase-out of hard coal subsidies, leading to the closure of the two last remaining hard coal mines in 2018. Lignite production, on the other hand, has largely managed to maintain its competitiveness vis-à-vis other fuels and has remained an important part of each country's electricity and heat production. In the Czech Republic, it was even decided to allow mining beyond the so-called “territorial environmental limits”, i.e. beyond the areas where a 1991 government decree explicitly allows open-pit mining [23–26].

Table 1
Statistical overview of the coal heartland (2016).
Source: [104].

	Germany	Poland	Czech Rep.	EU28
Population (million)	82.2	38.0	10.5	510.3
Real GDP per capita (thousand euro)	34.9	11.3	16.5	27.1
Greenhouse gas emission per capita (tonnes of CO2 equivalent)	11.4	10.5	12.4	8.7 (provisional)
Solid fuels - primary production (thousand tonnes)	191.2	130.6	45.3	481.3
Share of non-renewable solid fuels in final energy consumption	24.3%	49.1%	39.7%	14.6%
Share of solid fossil fuels in gross electricity production	40.3%	78.2%	50.4%	21.2%
Number of employees in coal mining	16,729	96,076 (2015)	17,299	150,229

Below we provide a map of the three countries' coal-producing regions (Fig. 1), present basic statistical information about the countries and their coal industries (Table 1), provide insight into the structure of the national coal industries (Table 2), and introduce the government coalitions during the period of interest (Table 3). More contextual information can be found in Annex 2.

3. Theory and literature

3.1. Literature review

The literature on the future of coal has recently been developed mostly within the fields of economics [27–29] and energy and environmental policy studies [30,31]. The issue has also been subject to growing attention of energy transition scholars [32,33]. Despite being profoundly diverse in their fields of origin and utilized approaches, many existing studies share a common feature: they subscribe to a materialist ontology. They stress the importance of material factors such as geological conditions, extraction costs, cost–benefit balances or investment flows over ideational factors such as beliefs, norms or ideas attached to the issue in question [34,35].

Within the limited volume of studies operating with an ideational ontology, two major strands of research can be identified. The first is represented by studies primarily focused on beliefs, norms, perceptions or frames of energy policy actors [21,36,37], while the second focuses

Table 2
Coal industry.

	Mining company	District	Active mines	Ownership	
Germany	RWE Power	Rhineland	3	RWE AG (90.5% private ownership, 9.5% municipalities)	
	Vattenfall Europe AG; LEAG since October 2016	Lusatia	4	Vattenfall AB; since October 2016: 50% EPH, 50% PFF Group	
	MIBRAG	Central Germany	2	EPH	
	ROMONTA	Central Germany	1	Private ownership	
	RAG	Ruhr	2	RAG Foundation	
Poland	Jastrzębska Spółka Węglowa	Upper Silesian Basin	4	Ministry of Energy (55.16%), private investors (44.84%)	
	Polska Grupa Górnicza ¹	Upper Silesian Basin	8	PGNiG TERMIKA, WĘGLOKOKS, PGE Górnictwo i Energetyka Konwencjonalna, Silesia, Ministry of Energy, and private investors	
	Tauron Wydobycie	Upper Silesian Basin	3	TAURON Polska Energia	
	Przedsiębiorstwo Górnictwa Silesia	Upper Silesian Basin	1	EPH	
	Lubelski Węgiel Bogdanka	Lublin Basin	1	Enea group (66%), TFI PZU (5%), private investors (29%)	
	Węglokoks	Upper Silesian Basin	1	Ministry of Energy	
	Zakład Górnictwa Siltech	Upper Silesian Basin	1	Private ownership	
	Zakład Górnictwa Eko-Plus	Upper Silesian Basin	1	Private ownership	
	Czech Republic	OKD	Upper Silesian Basin	5	Private ownership
		Severočeské Doly	Northern Bohemian Basin	2	ČEZ
Seven		Northern Bohemian Basin	1	Private ownership	
Vršanská Uhelná		Northern Bohemian Basin	1	Private ownership	
Sokolovská uhelná		Sokolov Basin	2	Private ownership	

Notes:

¹ The Polish Mining Group was reorganized in May 2016 when the workforce and mines transferred from the bankrupt Kompania Węglowa. Source: authors.

on the perspective of the “end-users” of climate and energy policies: coal miners, coal mining communities, or communities affected by coal-induced environmental damage [38–40]. With regards to the European coal heartland, ideational literature is rather rare. Altogether, there has been just a handful of articles dealing with the future of coal in the region [14,37] or its coverage in the media [41,42]. By providing an account of the media coverage of the future of coal in the region, this article seeks to fill this apparent gap in the understanding of the ideas and patterns of meaning attached to coal. In addition, the article allows for a comparative perspective, which is rarely seen in the empirical research on coal.

3.2. Theoretical assumptions

The theoretical background of this article stems from the constantly evolving interaction among political, public and media agendas. The political agenda is co-shaped by the public agenda while being mediated by the means of mass communication towards the public, whose preferences drive the media agenda [43–45]. From this complex landscape, this article selects the media agenda as its primary focus and utilizes the concept of agenda setting as its theoretical guidance. Agenda setting theorists posit that media affect the public agenda by providing topics to be discussed [46]. Central to their reasoning is the concept of salience. The meaning of salience is twofold: one assumes that increased media coverage makes an issue more easily retrievable from (the media consumer's) memory and therefore more likely to dominate judgments, opinions and decisions [47], while the other suggests that issues which gain more coverage are considered more important [19].

The issue-oriented “first-order” agenda setting was further refined to capture the variance in perspectives via which the media approach the issues they cover (“second-order agenda setting” [48]) and broadened to include also the relational aspects between its constitutive elements and discursive actors (“third-order agenda setting” [49]). The presented research follows the logic of second-order agenda setting. This iteration of the concept assumes that media construct a specific image of an issue by highlighting some of its attributes while suppressing others. It has been demonstrated, although not universally,

that attribute salience in the media agenda correlates with that in the public agenda and consequently affects the political process and political agenda [50,51]. Media can steer or trigger political action either directly, i.e. through the exposure of policymakers to media content [52], or indirectly via the “proxy effect” [53], a complex interplay between political agenda, media and public opinion. Being aware of the media's effect on “the standards by which governments, policies and candidates for public office are judged” [20], policymakers react to what they expect to be the effect of media content on public opinion [45].

Detailed knowledge of the attributes and narratives the media associate with the future of coal can therefore inform our understanding of public attitudes towards the issue as well as the feedback that policymakers receive from the media. Importantly, both will eventually shape the policies acting on the issue [47].

4. Design and methods

Empirical studies engage with the agenda setting concept mostly by testing its central thesis [54] or by exploring the content of (mainly) the media agenda [55,56]. Following the latter pathway, this article investigates the salience of attributes which constitute the issue of the future of coal in the countries of the coal heartland. In practical terms, the research process consisted of five major steps: the formation of the data corpus out of the relevant articles published in the selected media over the selected time period, the formulation of the coding scheme used to map the agenda, the pilot coding and subsequent refinement of the coding scheme, the coding, and, finally, the interpretation of results (Fig. 2).

The data corpus features articles from two high-circulation broadsheets (one left-leaning and one right-leaning) and one weekly magazine focused on politics in each country (see Table 4). Such selection is in line with established practice in the field: the number of news sources used in comparable analyses typically varies between one [57,58] and five [59], with two or three being the most common [54,60,61]. Considerably broader samples can be found in studies building their corpora through a keyword search in media databases [62,63], but such selection approach makes it difficult to account for the different

Table 3
Governing coalitions.

	Election date	Government duration	Coalition party	Party orientation	Popular vote	Seats	Relevant offices	Coal policy
Germany	September 22, 2013	December 17, 2013–October 23, 2017	CDU-CSU	Center-right (Christian democratic)	41.5%	311/631	<ul style="list-style-type: none"> • Chancellor (Angela Merkel) • Minister of Finance (Wolfgang Schäuble) 	Gradual coal phase-out once coal is not necessary for security of supply.
			SPD	Center-left (social democratic)	25.7%	193/631	<ul style="list-style-type: none"> • Deputy Prime Minister, Minister for Economic Affairs and Energy (Sigmar Gabriel) • Minister for the Environment, Nature Conservation, Buildings, and Nuclear Safety (Barbara Hendricks) • Prime Minister (Donald Tusk, Ewa Kopacz) • Minister of the Environment (Maciej Grabowski) • Minister of the State Treasury (Andrzej Czerwiński) 	Gradual coal phase-out. The party is split between its environmental and pro-industry wings.
Poland	October 9, 2011	November 18, 2011–November 16, 2015	PO	Center-right (Christian democratic)	39.2%	207/460 (lower chamber) 63/100 (upper chamber)	<ul style="list-style-type: none"> • Prime Minister (Donald Tusk, Ewa Kopacz) • Minister of the Environment (Maciej Grabowski) • Minister of the State Treasury (Andrzej Czerwiński) • Deputy Prime Minister, Minister of Economy (Janusz Piechociński) 	Pro-coal, moderately opposing the EU's decarbonization policies.
			PSL	Center-right (agrarian)	8.4%	28/460 (lower chamber) 2/100 (upper chamber)	<ul style="list-style-type: none"> • Deputy Prime Minister, Minister of Economy (Janusz Piechociński) 	Gradual replacement of coal by renewable energy sources.
			PiS	Right-wing (populist)	37.6%	235/460 (lower chamber) 61/100 (upper chamber)	<ul style="list-style-type: none"> • Prime Minister (Beata Szydło, Mateusz Morawiecki) • Minister of the State Treasury¹ (Dawid Jackiewicz) • Minister of Energy² (Krzysztof Tchórzewski) • Minister of the Environment (Jan Szyszko) • Prime Minister (Bohuslav Sobotka) • Minister of Industry and Trade (Jan Mládek) 	Pro-coal, strongly opposing the EU's decarbonization policies.
Czech Republic	October 25 and 26, 2013	January 29, 2014–December 13, 2017	ČSSD	Center-left (social democratic)	20.5%	50/200	<ul style="list-style-type: none"> • Deputy Prime Minister (Andrzej Babiś) • Minister of Finance (Andrzej Babiś) • Minister of the Environment (Richard Brabec) 	Traditionally pro-industry, including coal mining. Unclear.
			ANO 2011	Center (populist)	18.7%	47/200	<ul style="list-style-type: none"> • Minister of the Environment (Richard Brabec) 	Unclear.
			KDU-ČSL	Center-right (Christian democratic)	6.8%	14/200	–	Unclear.

Notes:

¹ In office until September 15, 2016, subsequently dissolved and competences transferred to Ministry of Energy.

² Ministry founded after the elections to streamline competences on energy matters within energy governance. Source: [28–30, authors].

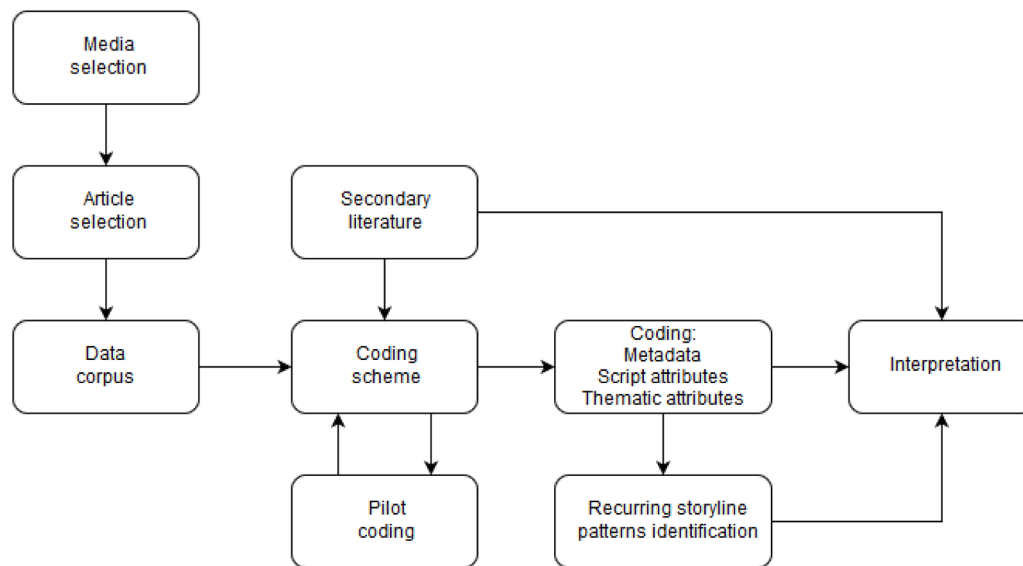


Fig. 2. The research process.

importance of individual media in the overall agenda.

The time period followed by the article is June 12, 2015–June 11, 2016, i.e. six months before and after the sealing of the Paris agreement, one of the most recent turning points in the global energy arena. The rather wide timeframe is expected to capture agenda patterns beyond the mere reaction to the conference.

The following selection criteria were adopted to determine whether an article would be included in the data corpus: (1) presence of the keyword “coal” within the text; (2) clear relevance to the national energy industry – in particular to the technical, economic, environmental, or societal aspects of energy production or use; and (3) presence of a future element within the article, i.e. only articles featuring at least one segment about the future of any aspect or element of the national energy industry were included in the corpus. The first step of the selection process was automated, using the keyword “coal” to build the initial database, which was subsequently reduced through the application of the second and third selection criteria. These were applied manually by trained coders. Overall, the selection process resulted in a data corpus of 1015 articles.

Similar to the Pan and Kosicki's approach to media analysis [64] the following three types of information were extracted from the source articles: (1) metadata, such as the article's publication date and publisher; (2) script attributes, which include information such as who is referred to in the article, what time horizons the article relates to, or what geographical regions the article covers; and (3) thematic attributes, i.e. the meaning patterns present in the article. The identification and analysis of the thematic attributes, which included elements of grounded theory and qualitative and quantitative content analysis [65–67], was largely centered around building, testing and applying a coding scheme – a widely used tool to extract meaning from text. The coding scheme was conceived using a combination of deductive and inductive approaches [68–70]. First, the literature on the topic of the future of the coal industry in Europe (e.g., [21,37,38]) was reviewed and theoretically relevant concepts were extracted and formulated as codes [65,71]. Additional codes emerged from a repeated close reading of the corpus, during which repeatedly occurring themes, i.e. meaning patterns [64], were identified and turned into codes.

Within the pilot coding, the coding scheme was tested on a sample of 158 articles, i.e. 17% of the whole corpus, which is in line with the recommendation by Neuendorf [67], according to whom the sample should cover at least 100 articles and 10% of the corpus. The sample was selected so as to allow for relatively even coverage of the research time frame, national context and selected newspapers. In line with

Krippendorff and Bock [72], the results of the pilot coding facilitated further adjustment and clarification of the coding scheme (see Annex 1).

The coding process consisted in applying the coding scheme to the data corpus. Initially, the article metadata and script attributes were identified. Then, the coders again closely read the corpus and identified the primary and secondary thematic attributes (codes) which conveyed the meaning of each article. Primary codes capture the dominant meaning pattern of the articles, while secondary codes list other patterns identified in their texts. Each article could be assigned with multiple secondary codes but just one main code. In addition to the codes, recurring storylines patterns (narratives) were identified and included in the interpretation to contextualize the results of the main analysis [73]. The coding process entailed inserting the article identifiers alongside the codes in an Excel table (see Annex 3). The researchers participated in the coding by training the coders and via regular consultations with them. During the consultations, ambiguities in coding were resolved collectively, thereby strengthening coding reliability [74,75].

5. Results

5.1. Germany

Within the German text corpus, lignite is much more salient than hard coal. In cases when the type of coal is specifically mentioned (in 43% of source articles), regardless of the type of newspaper, 32.4% of articles pay particular attention to lignite, while 10.6% mention hard coal, whether exclusively or together with lignite. This corresponds to some extent to the geographical focus of the articles. While most deal with the national scale, the notion of regions particularly relates to the lignite regions or more specifically to districts and towns located within these regions.

Corresponding to the geographical focus, we find a dominant representation of members of the federal government, followed by representatives of energy companies. In all three papers, the most important “speakers” appear in the same ranking order. Of greatest importance are the then Minister for Economic Affairs, Sigmar Gabriel, followed by Chancellor Angela Merkel and then Minister for the Environment Barbara Hendricks, who are the most salient actors and who co-occur most frequently in the media (Fig. 3). This could be explained both by the broad focus on energy around the Paris conference and by national debates on the “standby reserve” delivered by

Table 4
Overview of source media.

Media	Category	Circulation	Publisher	Ownership	Source articles
Germany	Left-leaning broadsheet	382,050	Süddeutscher Verlag	81.25% Südwestdeutsche Medien Holding; 18.75% private ownership	118
	Right-leaning broadsheet (FAZ)	252,676	Frankfurter Allgemeine	93.7% Fazit Foundation; 6.3% editors	130
	Political magazine	793,087	Spiegel-Verlag	50.5% Spiegel-Mitarbeiter KG; 25.5% Gruner + Jahr Publisher; 24% private ownership	36
Poland	Left-leaning broadsheet	150,640	Gremi Media	Private ownership	208
	Right-leaning broadsheet	56,266	Agora	Private ownership	155
	Political magazine	118,469	Polityka	Private ownership	6
Czech Republic	Left-leaning broadsheet	82,083	Právo	Private ownership	133
	Right-leaning broadsheet ¹	143,141	MAFRA	Private ownership ²	217
	Political magazine	34,221	Economia	Private ownership ³	12

Notes:

¹ Since being acquired by Agrofert in 2013, the traditionally center-right broadsheet has gradually moved towards the center. Such shift would make Hospodářské noviny, a business-oriented right-wing broadsheet with a circulation of 30,177, more suitable for the analysis. However, the newspaper is published by Economia, a publishing house owned by Zdeněk Bakala, who until 2017 held a majority share in the OKD coal mining company (see note 3). Including Hospodářské noviny would mean having two out of three media associated with the coal industry.

² Until its 2017 placement in a trust fund, Agrofert belonged to then Minister of Finance and current PM Andrej Babiš.

³ Zdeněk Bakala, the sole owner of the Economia publishing house, held a majority share in the OKD coal mining company between 2004 and 2017. Sources: [105–109].

decommissioned lignite power plants and the dialogue process held in the run-up to the federal climate action plan [76].

The picture is somewhat different with regard to institutional actors (Fig. 4). While in both the moderate left-leaning SZ and the Spiegel the federal government appears as the most salient actor, the articles of the moderate right-leaning FAZ most frequently mention the energy company RWE—the most important operator of lignite-fired power plants. However, if we look at the group of the three most mentioned institutions, we find fewer particularities. Additionally, this might be caused by the fact that FAZ more often refers to the individual ministries than does SZ, which indicates that the variance can be explained by the greater specificity of FAZ. Political parties do not play a major role in the German media agenda. However, the Greens are the party that receives the most mentions, which can be explained by its role as an opposition party that also has environmental protection as a salient issue. The governing parties of the grand coalition CDU/CSU and SPD are mentioned less often. This is quite understandable as members of the government often speak primarily for the government.

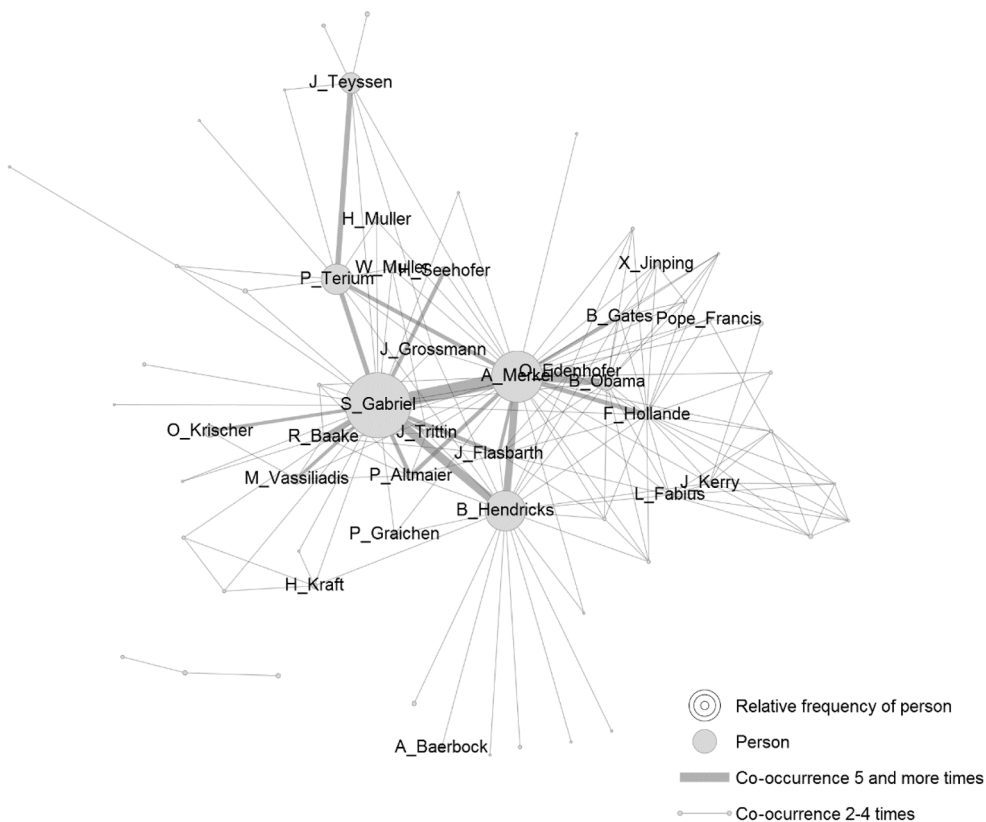
Two clusters can be distinguished according to the covered timeframes (Fig. 5). About 40% of articles cover a narrow timeframe until 2020. A second cluster, comprising about 25% of articles, explicitly mentions the year 2050, which serves as a decisive date in the Paris agreement. Both years are important with regard to European climate and energy goals for 2020 [77] as well as the German Energy Concept [78]. Nearly all other articles mention a timeframe in-between, while five articles (three Spiegel articles, one SZ, and one FAZ) look beyond 2050.

The overall emotional assessment of the articles toward coal is neutral. Eighty percent of the articles employ a neutral framing of coal. There are slight differences between the three papers. In both the left-leaning SZ and the Spiegel, we find more articles carrying a negative emotional assessment (23% and 22%, respectively) than in FAZ (11%). It is striking that only a negligible number of articles, three in each SZ and FAZ, express a positive assessment of coal. In the typical negative article, “climate”, “uncompetitive”, and “technology of the past” represent the primary and secondary thematic codes. In most of the negative articles, we find a combination of the “climate” and “technology of the past” codes. Without delving too deep into the content of the articles, we find expressions for coal such as “Klimakiller” (climate killer) and “schmutzig” (dirty), while lignite power plants are dismissed as “schlimmste Klimasünder” (worst climate sinners) and portrayed as a particular “dreckige” (filthy) technology of electricity generation. Neutral articles more frequently stress the necessity of thoughtful phase-out management in order to achieve a carbon-free energy supply or debate the consequences of phasing out the traditional backbone of German industry. It is interesting that in the neutral articles the “technology of the past” code equally appears as the most frequently detected secondary code.

Concentrating on the thematic structures (Figs. 6 and 7), the articles develop stories mostly along the lines of the following primary codes: “climate” (20.1%), “phase-out management” (18.3%), “uncompetitive” (16.2%), and “opportunity” and “technology of the past” (both 7.0%). The most relevant secondary codes include “technology of the past” (34.5%), “phase-out management” (22.5%), “climate” (21.5%), “uncompetitive” (15.1%), and “opportunity” (13.4%).

The code frequencies do not differ much according to political orientation of the newspapers. Overall, there exist strong similarities between the different papers, with similar issues linked in a similar fashion. It is possible to identify three narrative patterns that emerge in all three newspapers. The dominant narrative integrates the environmental issue of “climate change” and the energy transition codes “phase-out management” and “technology of the past” and can be labeled as the “Sustainable change” narrative. The underlying storylines of this frame see global climate change as the driving force and justification for a sustainable energy transition, with coal representing an obstacle to move forward in the right direction. While the narrative

People co-occurrence



Occurrence of people - top 10%

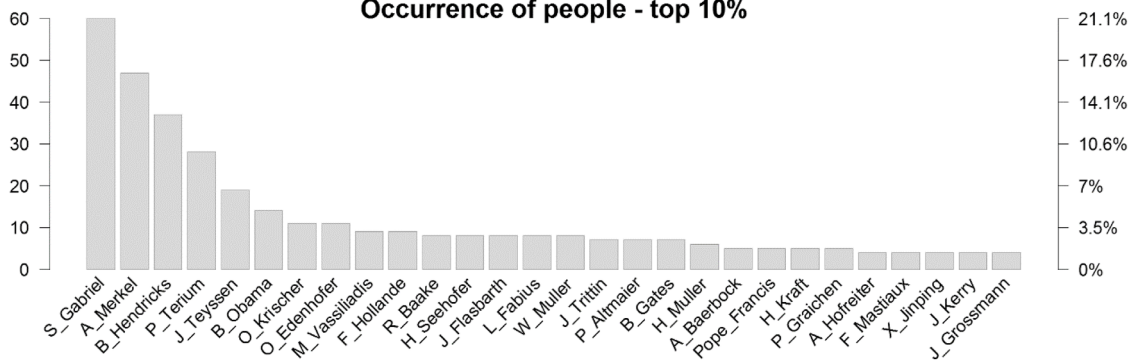


Fig. 3. Occurrence of people in German media.

Occurrence of institutions - top 10%

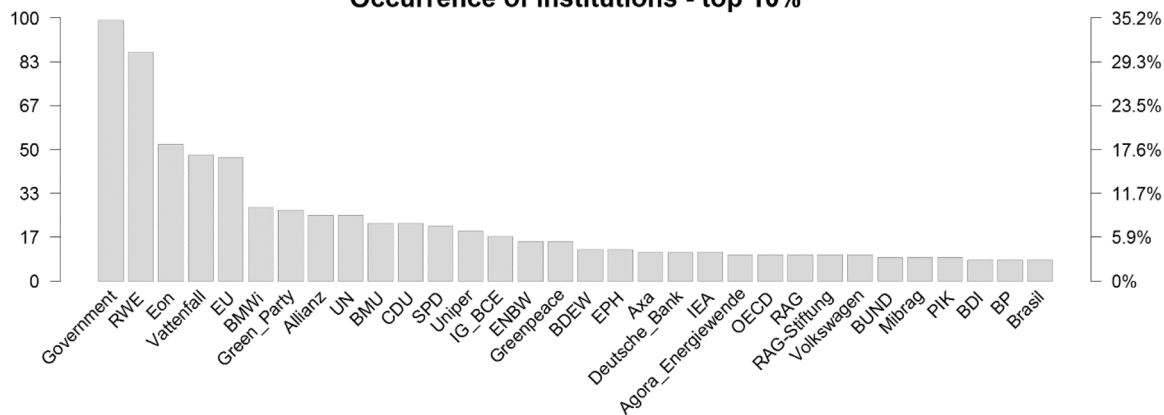


Fig. 4. Occurrence of institutions in German media (top 10%).

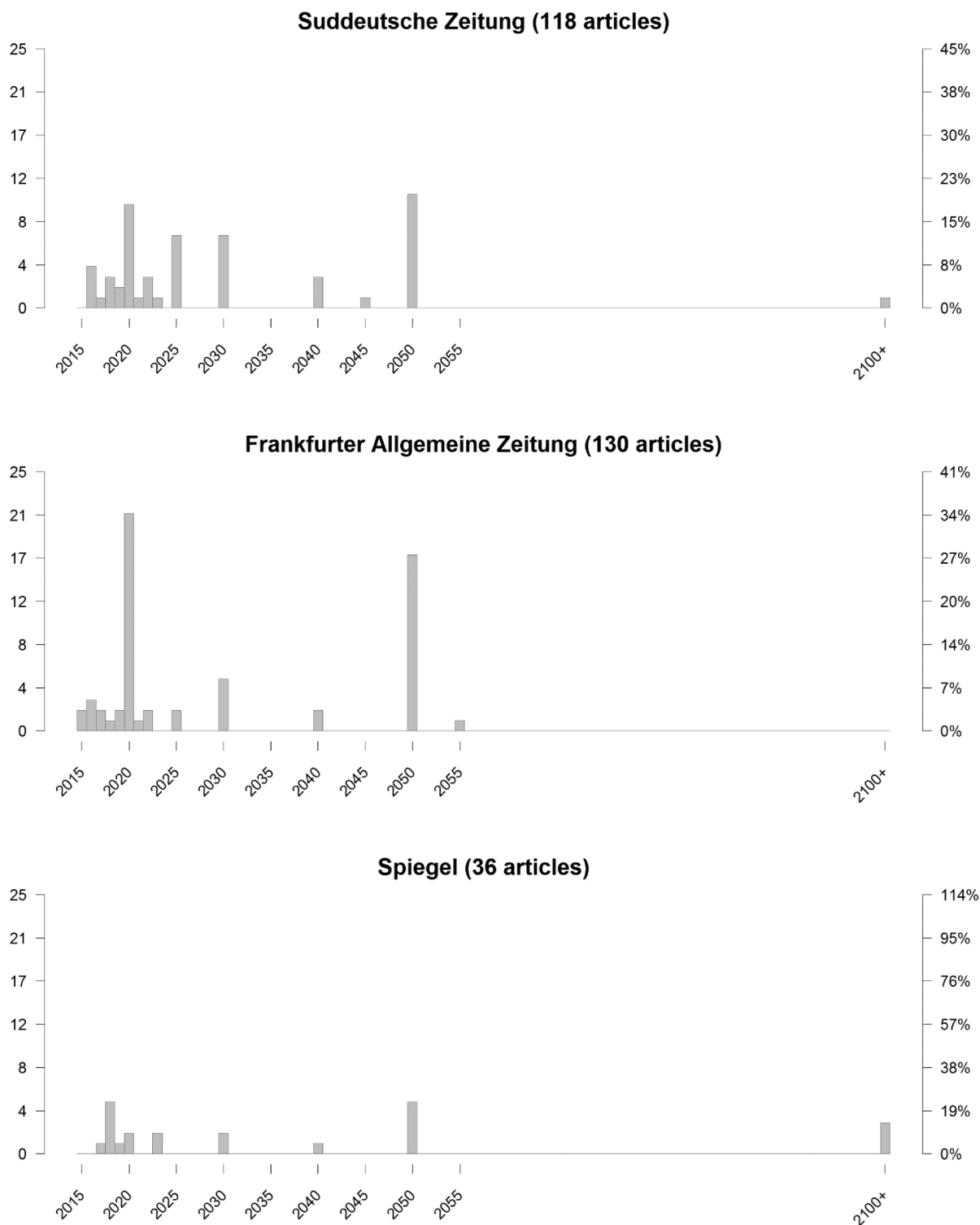


Fig. 5. German media: timeframe.

recognizes the current importance of coal as an energy source, it concentrates on opportunities to manage an immediate phase-out. The secondary code of “technology of the past” supports the narrative by devaluating coal as an inappropriate and outdated source of energy.

The second dominant narrative is constructed around the “phase-out management” code. In combination with the energy transition-related code “technology of the past” and the economic code “un-competitive”, it frames the techno-economic face of the energy transition. The underlying storylines establish a “Technological change”

narrative in that it concentrates on techno-economic issues of the energy system. While this narrative pays some attention to the systemic importance of coal in the energy mix and related problems of a coal phase-out, it does not challenge its overall necessity.

Rather isolated from these two dominant narratives are storylines that form the basis for the “Local context” narrative. They emphasize either the local assets of coal (e.g., employment) or its deficiencies (e.g., negative environmental externalities) but could be distinguished from the other narratives in that it primarily considers the local scale. This

Co-occurrence of primary and secondary codes

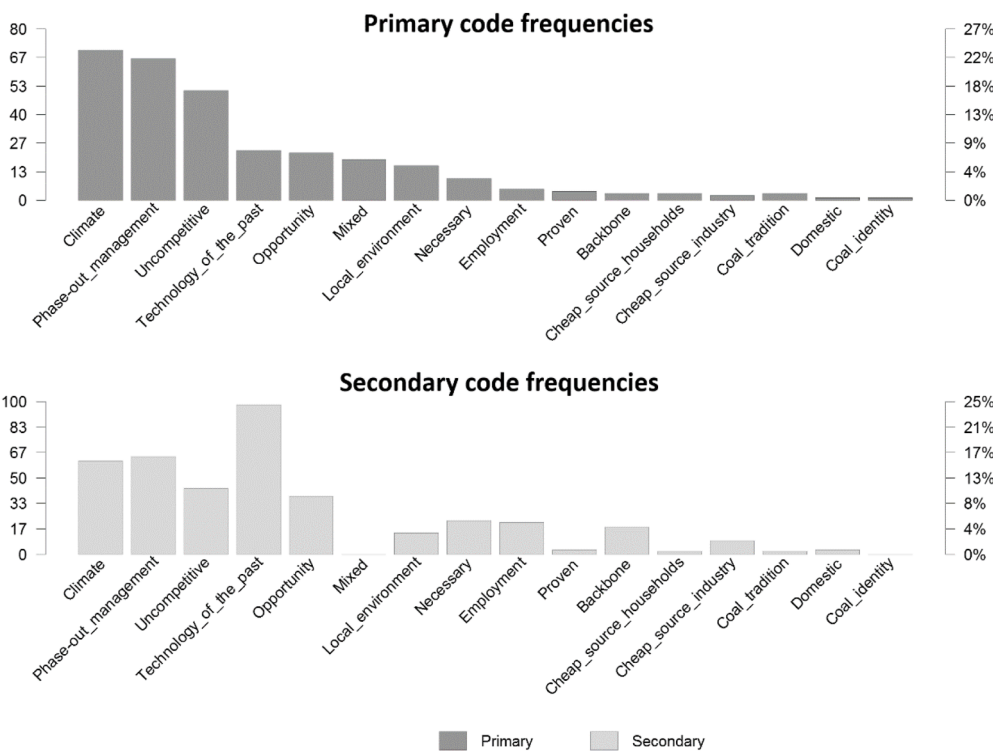
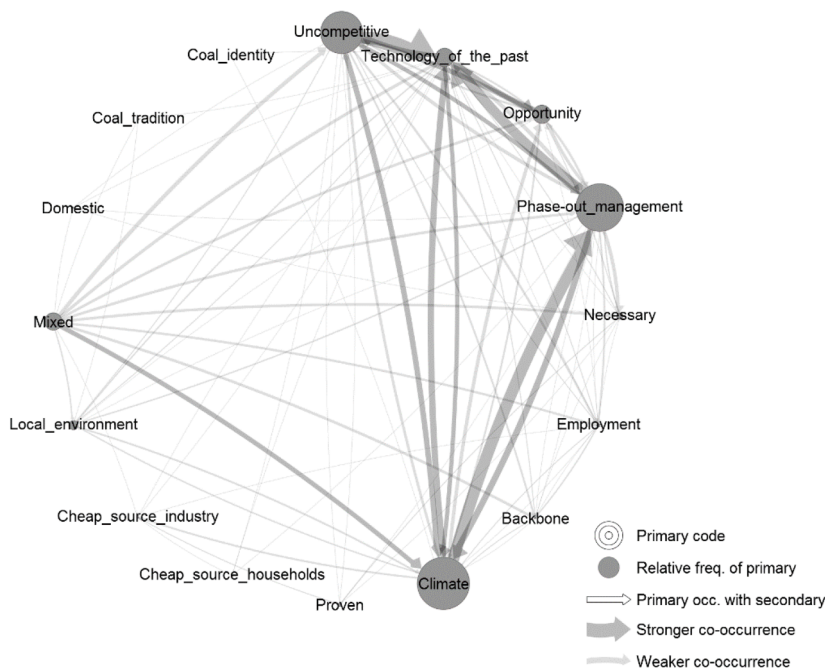


Fig. 6. Overview of thematic attributes in German media.

narrative emphasizes the fate of the coal regions and mentions individual places and communities. We should note, however, that this narrative is less frequently present in the text corpus in comparison to the two main framings described above.

Even though it appears much less frequently, we can also identify a “Coal defense” narrative in some articles. This narrative does not reject climate change, but it calls for a proportionate and careful debate on coal. The narrative emphasizes the necessity of “phase-out

management” while highlighting the importance of coal as a “proven” energy source and “backbone” of German industry. The underlying storylines criticize the course of the German energy transition, unfavorable cost dynamics, and repercussions on the security of energy supply. In this narrative the idea of the later implemented “capacity reserve” plays a central role. It is introduced as a substantial contribution of coal-fired power plants to maintaining energy security during the course of a transition towards an energy system dominated

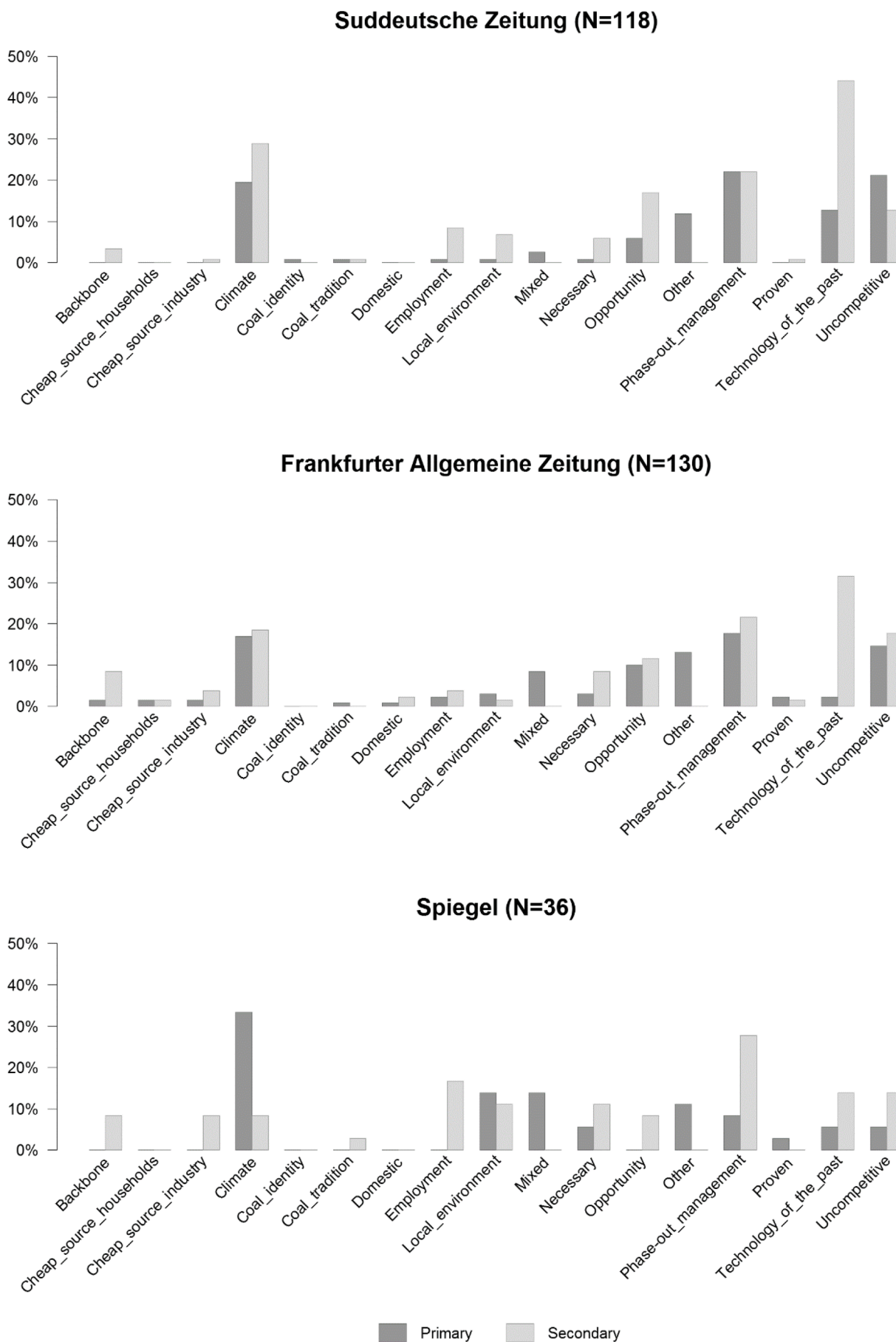
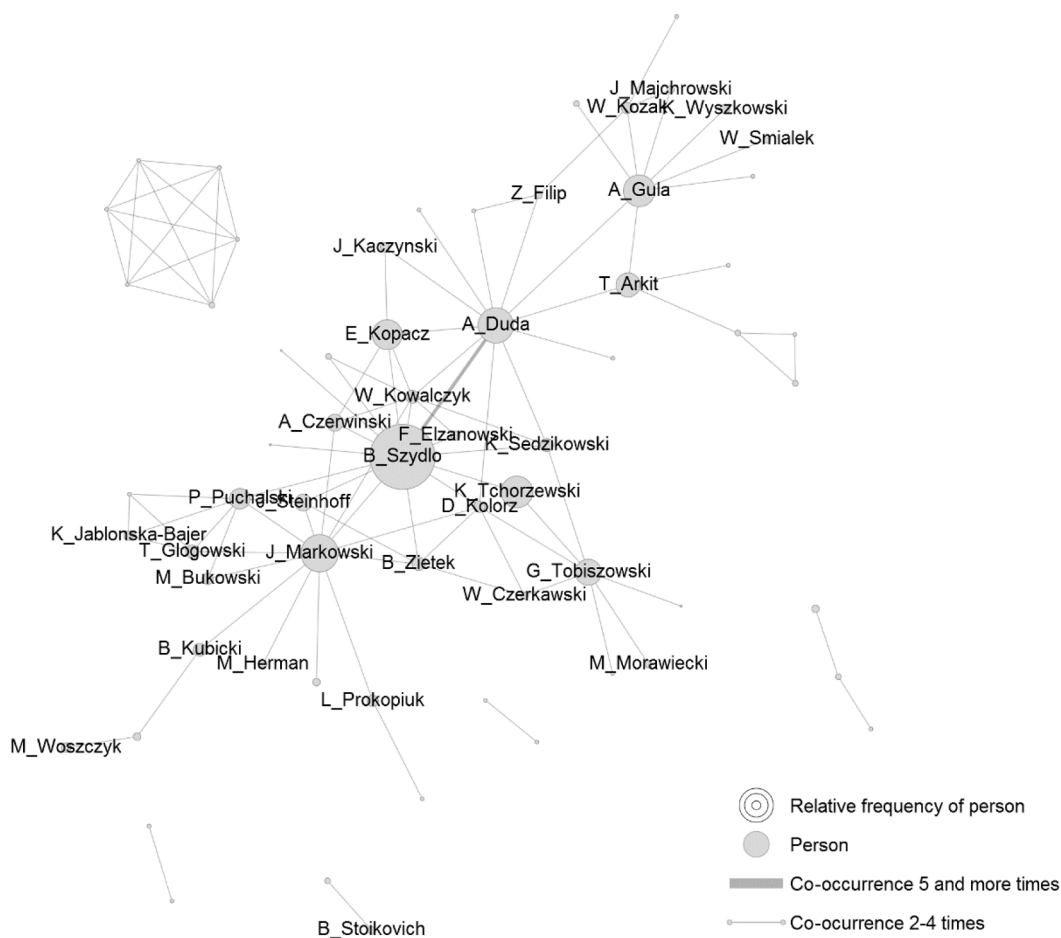


Fig. 7. Relative frequencies of codes across German media.

People co-occurrence



Occurrence of people - top 10%

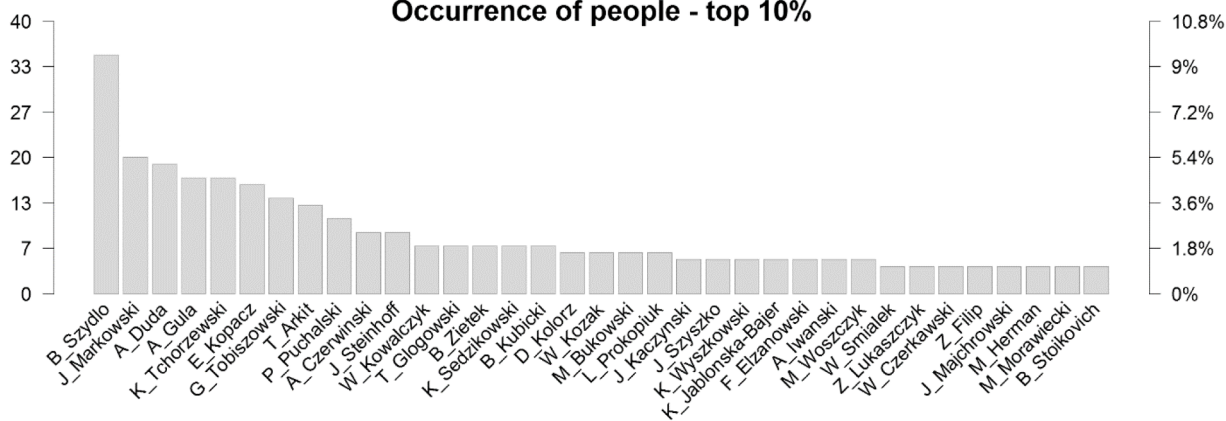


Fig. 8. Occurrence of people in Polish media.

by renewable sources.

5.2. Poland

In Poland, the strategic role of the coal industry and its financial problems have resulted in the media predominantly adopting industry-wide and national perspectives. Of the source articles, 88.1% refer to coal in general and draw no specific distinction between hard coal and lignite. Correspondingly, 81.8% of the articles discuss the topic exclusively at the national level, while the regional perspective is largely

missing from the debate. When regions are discussed, the focus is mainly on the Upper Silesian Basin (12.5%) and Lublin Basin (3.0%), where the major exploitable hard coal reserves are found. The regional edition of the left-leaning Gazeta Wyborcza also devotes considerable attention to the smog problem in the city of Cracow (7.9%).

The Gazeta Wyborcza also tends to be marginally more critical towards the industry. 22.6% of its articles portray coal negatively, while the right-leaning Rzeczpospolita published 15.5% negative articles. The share of positive articles, on the other hand, is 21.2% for Gazeta Wyborcza and 29.7% in the case of Rzeczpospolita. Altogether, 55.8%

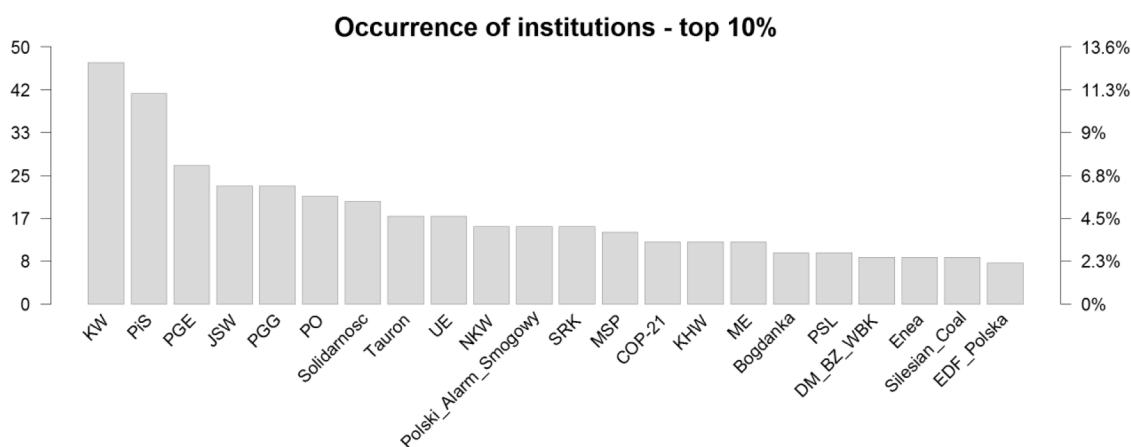


Fig. 9. Occurrence of institutions in Polish media (top 10%).

of articles are deemed neutral. Interestingly, positive and negative articles use a very similar set of themes to build up their messages. These themes are “uncompetitive”, “backbone” and “phase-out management”, which suggest that the newspapers subscribe to the same narrative but emphasize its components differently (see the analysis of thematic structures below).

With regard to the actors referred to or given voice in the media, the most frequently occurring people are associated with the government and major energy companies. The Prime Minister appears in 13.8% of the articles, with 4.3% dating before October 2015, when the office was held by Ewa Kopacz, and 9.5% referring to her successor, Beata Szydło. Other state representatives include President Andrzej Duda (5.1%), representatives of the Ministry of Energy Krzysztof Tchórzewski (4.6%) and Grzegorz Tobiażowski (3.8%), and then Minister of State Treasury Andrzej Czerwiński (2.4%, in office until October 30, 2015). These actors can all be regarded as pro-status quo. Non-status quo actors appear in the media to a much lesser extent. The exceptions to this rule are Paweł Puchalski, an analyst from the brokerage house BZ WBK (3.0%), and two public figures associated with fighting the smog problem in the Cracow municipal area: Tadeusz Arkit, Member of Parliament for the Civic Platform party (3.5%), and Andrzej Guła, Chairman of the Cracow-based NGO Krakowski Alarm Smogowy (also more commonly known under its national name Polski Alarm Smogowy) (4.6%). As with the smog topic itself, these two actors appear nearly exclusively in the left-leaning *Gazeta Wyborcza*. In general, the Polish media seem to be more preoccupied with substantive issues and less with personal accounts or viewpoints: the frequencies of the most salient actors are lower than in the other two countries and the co-occurrence network suggests that actors are rather dispersed across the articles (Fig. 8).

The coverage of institutions tends to focus on companies (Fig. 9). Kompania Węglowa (KW), the largest coal producer in the country, is the most frequently occurring entity (12.7%), largely due to the process of restructuring the company and therefore also the entire coal industry. Institutional coverage also includes other mining companies, such as JSW and the Polish Mining Group (PGG), which both appeared in 6.2% of the articles, as well as electricity production companies, such as PGE (7.3%) and Tauron (4.6%). The two main political parties, Law and Justice (PiS) and Civic Platform (PO), also occurred frequently, referred to in 11.1% and 5.7% of the articles, respectively. Finally, one of the largest trade and labor unions, NSSZ Solidarność, was mentioned in 5.4% of the articles.

Given the focus on the unfolding situation around the KW company, the timeframe within which the Polish media operate is rather short (Fig. 10). The immediate future (i.e., until 2020) was the focus of 97 articles, while 77 articles look beyond this date. The articles that look towards later periods often associate their stories with European targets

for 2030 and 2050.

Turning to the salience of thematic structures across the media (Figs. 11 and 12), the articles develop stories mostly along the lines of the following primary codes: “local environment” (18.4%), “phase-out management” (13.6%), “uncompetitive” (9.8%), “climate” (9.2%) and “employment” (7.0%). The most relevant secondary codes include “backbone” (14.4%), “uncompetitive” (10.0%), “proven” (8.4%), “employment” (7.6%) and “domestic” (7.0%). (Fig. 11)

Taking a closer look at the articles’ storylines, there are two main issues discussed with regard to the “future of coal”. The first issue is the story of the demise and restructuring of the KW company. The narrative around the story is typically presented as follows: a collapse of the coal industry would seriously undermine the country’s economic base (“backbone”, “employment”) as well as its energy security (“domestic”, “proven”). Since the market conditions are such that the threat of KW’s bankruptcy is imminent (“uncompetitive”), the government needs to arrange appropriate state aid and keep this vitally important industry alive (“phase-out management”). This storyline provides the basis for the main narrative that the analyzed media use to present and interpret new information. This “Coal continuity” narrative echoes the *Polska węglem stoi* (“Poland stands on coal”) slogan, which was originally disseminated by the country’s communist elite to promote the vision of rapid modernization by mobilizing the country’s coal production [37], and suggests that coal cannot be substituted and that its further use is inevitable.

In line with this narrative, profitability issues are typically presented as a challenge to be addressed. The positive articles even portray the failing mines as a chance for the remaining ones to increase their overall productivity and stabilize the country’s energy security. Climate concerns (“climate”) are often dismissed by pointing out that the Polish economy is still under development. Similarly, the potential of renewable energy is seldom discussed and those articles acknowledging that the golden era of coal is gone (“technology of the past”) still subscribe to the idea of coal’s inevitability within the energy system. Instead of energy transition, Poland seeks to cut its emissions by reinventing coal as a ‘clean’ and ‘modern’ source of energy.

The second narrative, “Local smog problem”, which is effectively developed only by *Gazeta Wyborcza*, appears to challenge the first by associating the smog issue directly with coal production and use. Upon closer inspection, however, the typical media storyline focuses mainly on sub-optimal heating practices at the household level and calls for policy measures such as banning inefficient boilers or introducing coal standards. Therefore, this narrative questions not the role of coal in the system but rather the local sociotechnical practices around it.

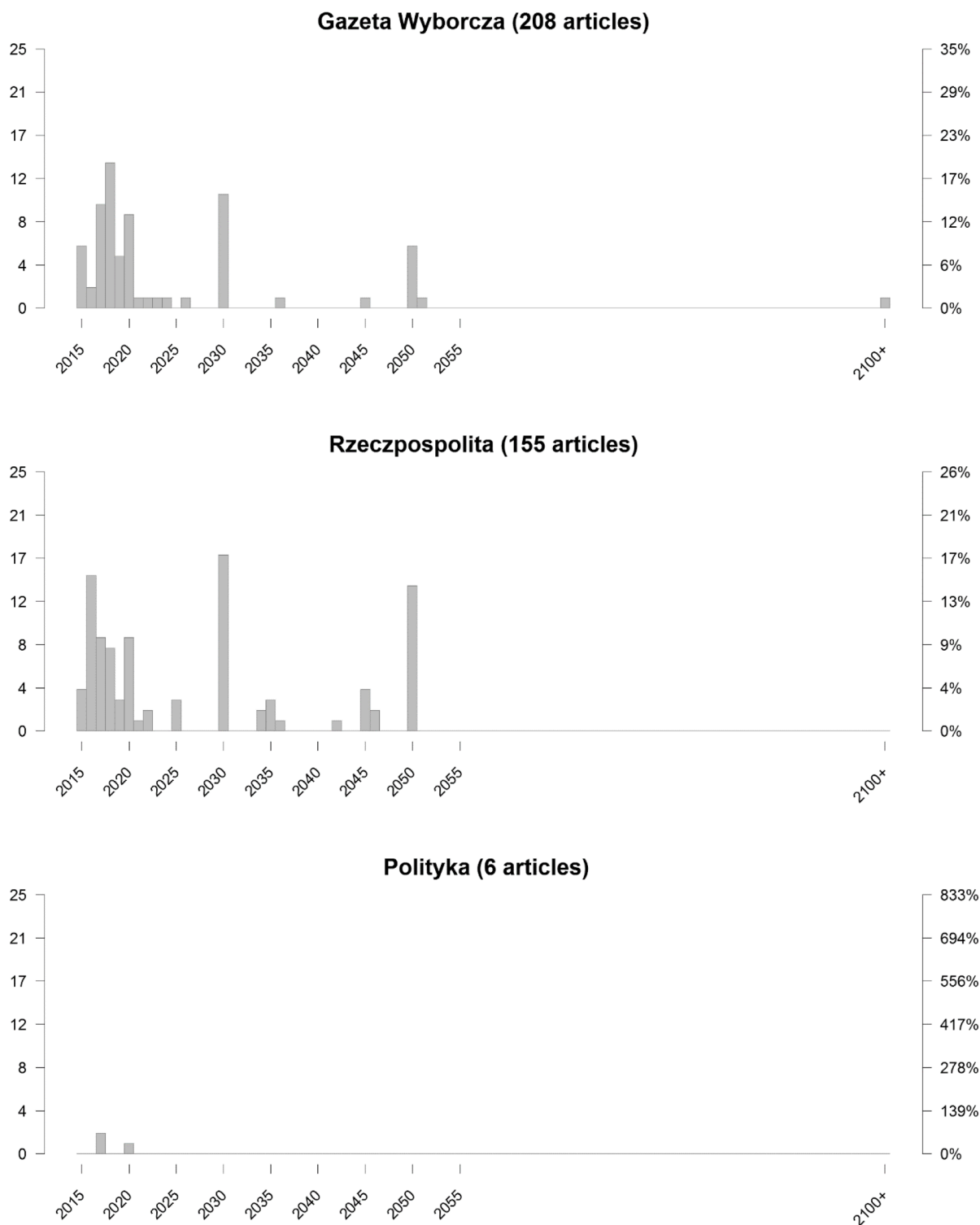


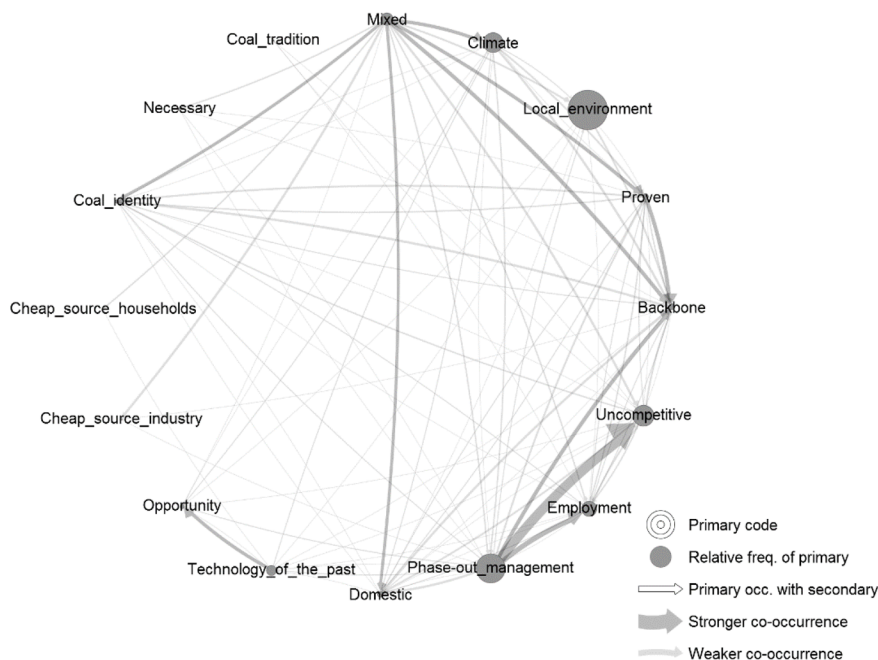
Fig. 10. Polish media: timeframe.

5.3. Czech Republic

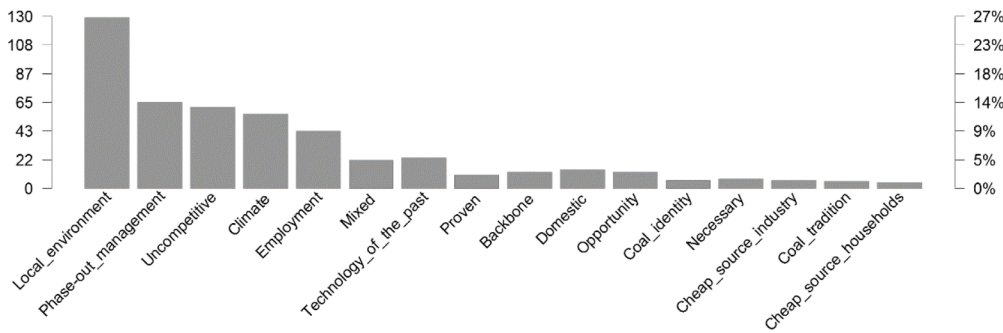
The contrast in development in the hard coal and lignite industries is reflected in Czech media by the fact that the majority of articles deal only with one type of coal. Of the 362 articles, only 19.0% refer to coal in general and 2.4% mention both types. The remaining 284 articles tend to focus more on lignite (47.0%) than on hard coal (31.5%). Correspondingly, Czech media focus predominantly on the peculiarities of the coal-rich regions. Only 13.8% of the source articles adopt a

country-wide (national) focus, a sharp contrast to the regions of North-Western Bohemia and Northern Moravia and Silesia, which set the stage for more than 30% of articles each. The results also show differences in the coverage of these regions among the studied media. The left-leaning Právo focuses predominantly on the hard coal-producing region of Northern Moravia and Silesia (40.1% of its articles) and devotes less attention to lignite-rich North-Western Bohemia (27.8%), while the center-right MF Dnes devotes 38.7% of its articles to the latter and 30.9% to the former. The national focus is considerably more salient in

Co-occurrence of primary and secondary codes



Primary code frequencies



Secondary code frequencies

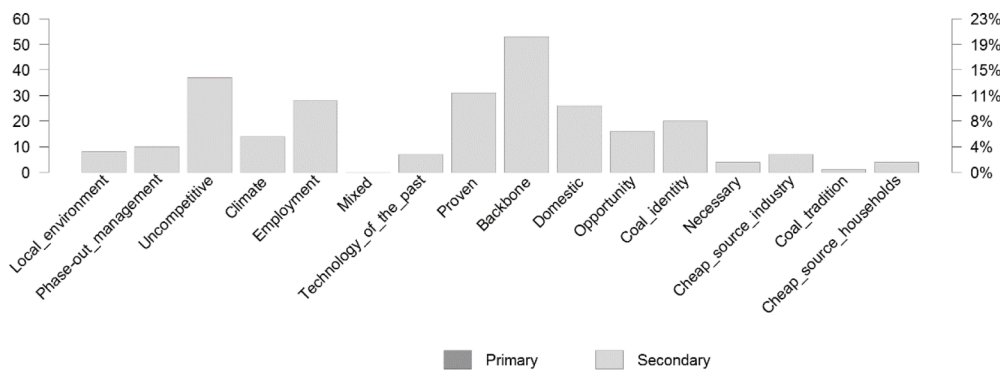


Fig. 11. Overview of thematic attributes in Polish media.

the weekly magazine Respekt (43.8%). Interestingly, these are the most visible differences between the surveyed media.

The main issues in the media agenda—the fate of the OKD company and the extension of lignite mining beyond decreed limits—became political problems that were dealt with mostly at the national level. The actors referred to in the media, therefore, come mostly from the governmental sector (Fig. 13). The Prime Minister (Bohuslav Sobotka) and the ministers of trade and industry (Jan Mládek), environment (Richard

Brabec), finance (Andrej Babiš), and labor and social affairs (Michaela Marksová-Tominová) together account for nearly 30% of all instances of people being mentioned in the articles. The most frequently occurring actor, the Minister of Trade and Industry, who is responsible for energy policy, is referred to in 24.0% of all articles and is the most frequently co-occurring actor for most of the other salient actors (Fig. 12). The most salient regional actors include OKD representatives Ivo Čelechovský (6.4%), Zdeněk Bakala (5.5%) and Jan Pytlík (5.2%);

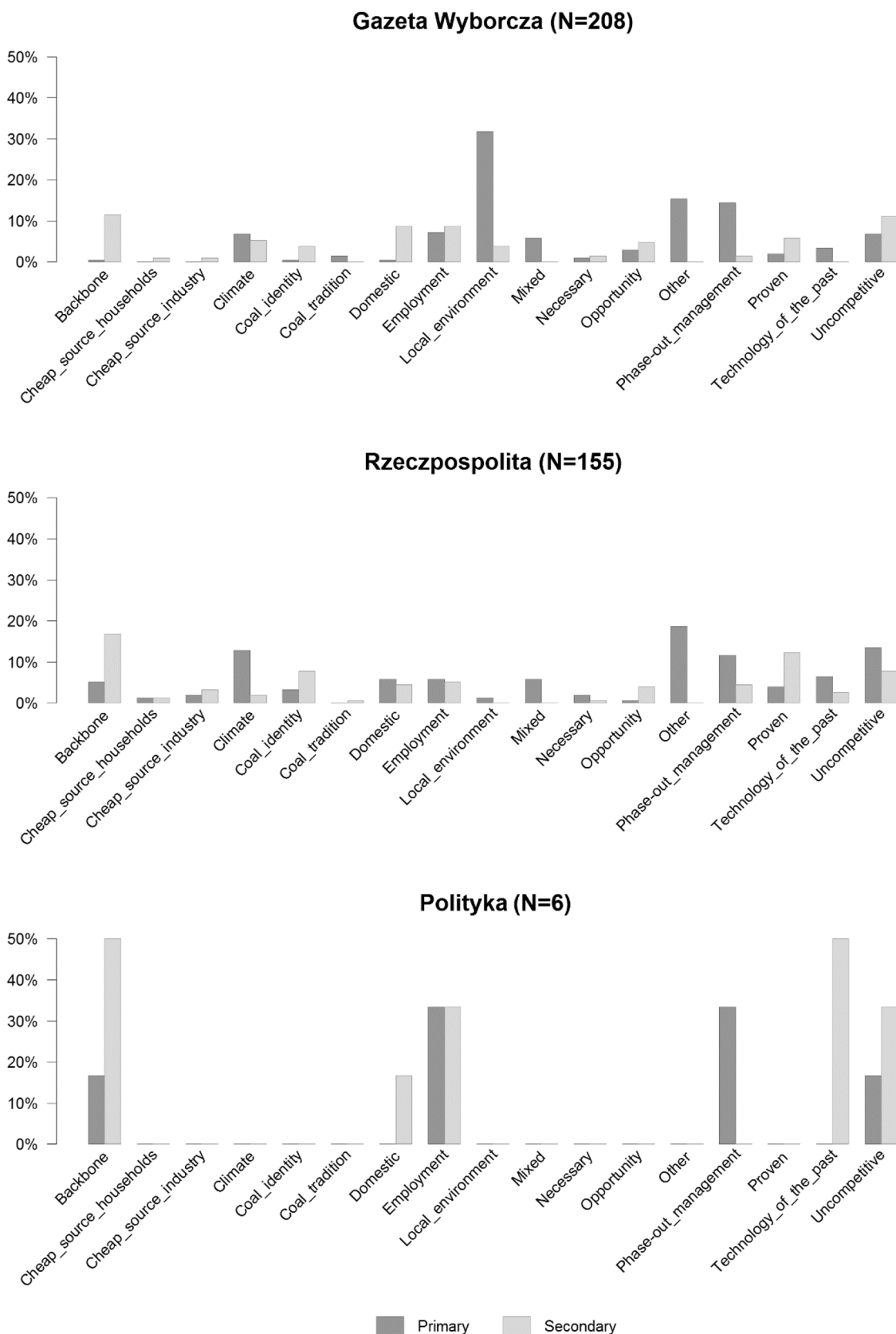
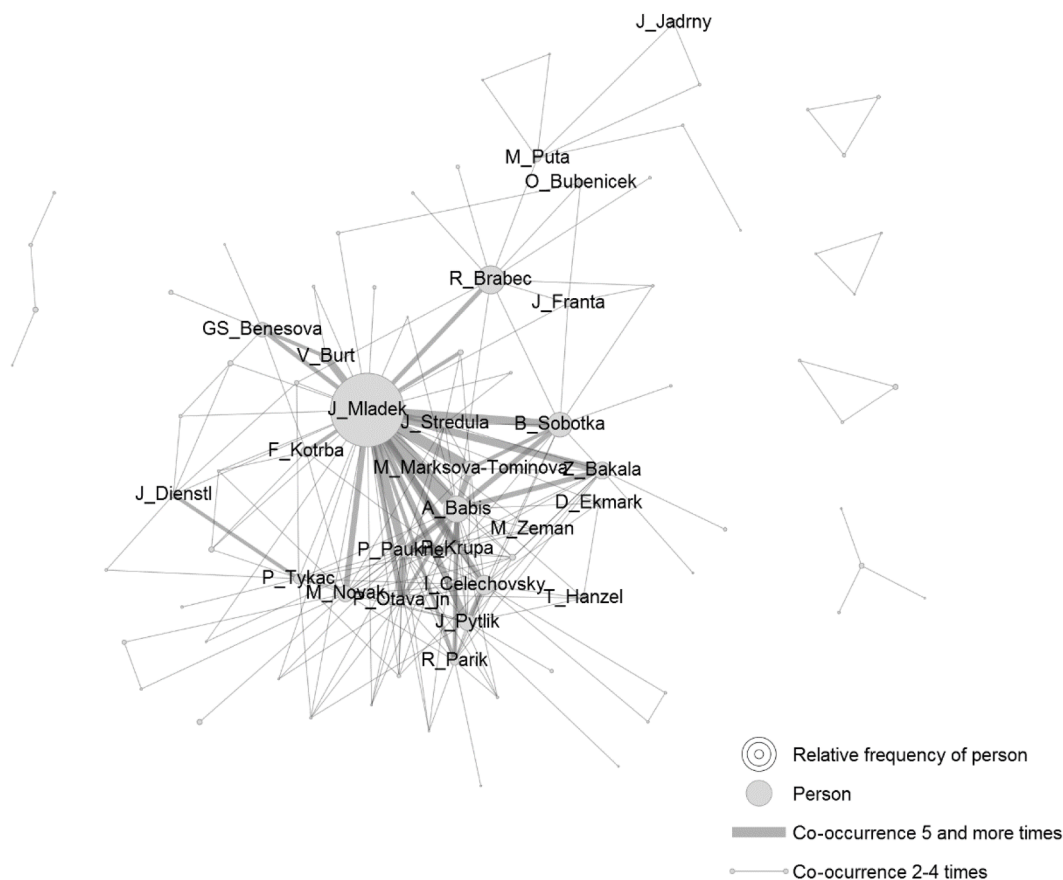


Fig. 12. Relative frequencies of codes across Polish media.

People co-occurrence



Occurrence of people - top 10%

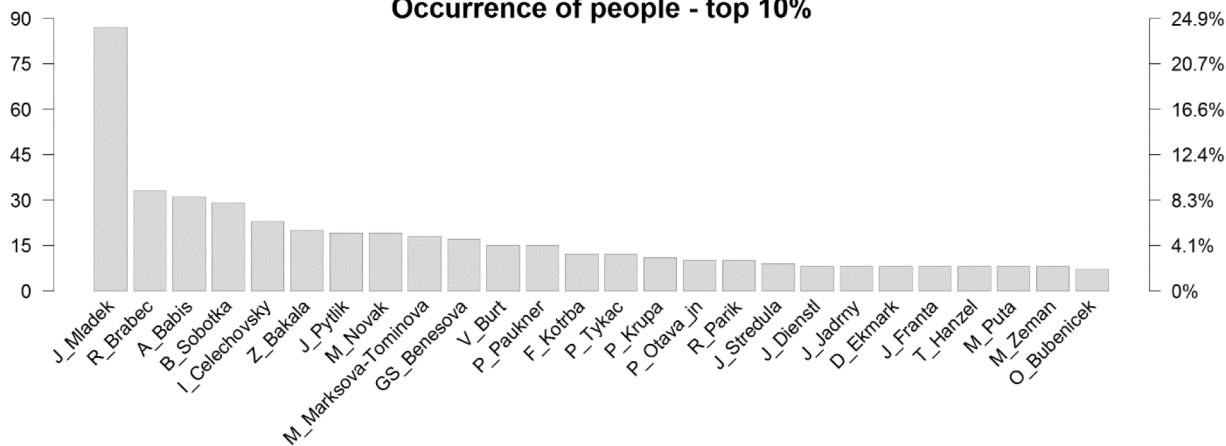


Fig. 13. Occurrence of people Czech media.

governor of the Moravian-Silesian Region Miroslav Novák (5.2%); two representatives of lignite-mining companies, Gabriela Sáričková Benešová (4.7%) and Petr Paukner (4.1%); and Vladimír Buřt (4.1%), the mayor of Horní Jiřetín, the town that has become the symbol of resistance to the revision of the territorial mining limits.

Correspondingly, the institutions the media refer to are mostly limited to coal mining companies, such as OKD (26.2% of source articles), NWR – the owner of OKD (12.7%), and Severní energetická (8.3%), and to government bodies, including the Ministry of Trade and Industry (MPO, 24.0%), Ministry of Environment (MZP, 17.4%),

Ministry of Finance (MF, 7.6%) and the government as such (21.3%). Unions also seem to be important in the agenda (12.7%). Local organizations and environmental NGOs, on the other hand, play a minor role. The most salient ones, Greenpeace and Hnutí Duha, appeared in just 2.2% of articles each (Fig. 14).

The OKD issue and the question of mining limits are by their nature imminent challenges. In the coal future agenda, this translates into rather short time horizons typically referred to in the articles: 60% of articles operate within the 2016–2020 timeframe and another 18% do not look beyond 2025. This applies especially to the left-leaning Právo,

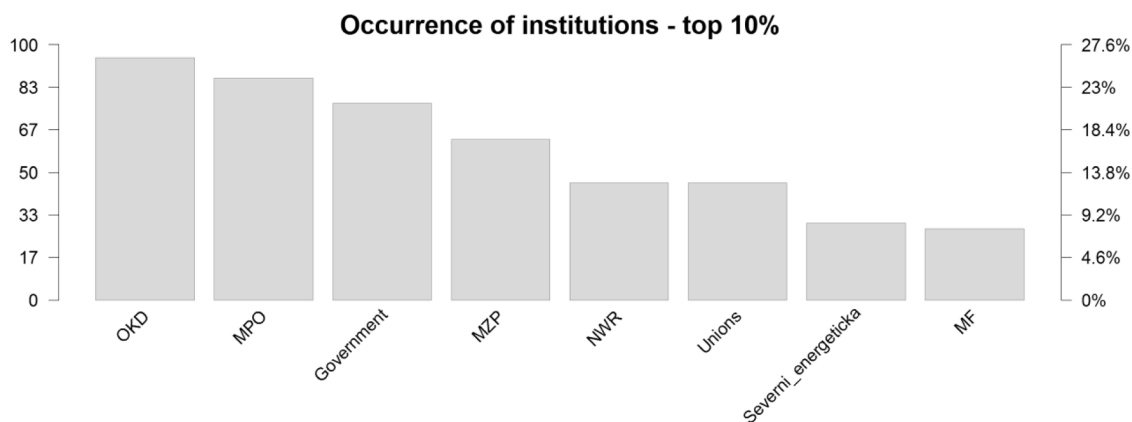


Fig. 14. Occurrence of institutions in the Czech media (top 10%).

where only 12% of articles present a longer timeframe than 2025 (Fig. 15).

With regards to the emotional assessment, the Czech media generally limit themselves to plain (neutral) reporting. Only 24 articles (7% of the whole corpus) approach the issue from a non-neutral standpoint. Negative messages tend to revolve around the impact of coal production and consumption on the local environment and present coal as an obsolete fuel, especially when compared to natural gas. The few positive stories stress the importance and reliability of coal technology for the country's energy system ("proven", "necessary"), highlight the socioeconomic benefits for local populations ("backbone", "employment"), or promote cultural events organized by mining companies ("coal tradition").

Concerning the thematic structures themselves, the codes that clearly dominate the agenda are "local environment" and "employment". The former appears in 33.4% of articles as the primary code and in 18.8% as a secondary code. The latter occurs infrequently as the primary code (3.3%) but in more than 30% of articles as a secondary code, making it by far the most frequent secondary code in the corpus. Other relatively salient codes include "uncompetitive", which appears as a secondary code in 20.7% of articles, and "phase-out management", which occurs as the primary code for 19.6% of articles (Figs. 16 and 17).

A closer look into the articles reveals that the media coverage of the two main issues yields two distinctive narratives. The first narrative, "Damage control", builds on storylines through which the media approach the fate of OKD. The rapid demise of the company nearly resulted in a rapid and unsupervised coal phase-out in the whole North-Eastern (Upper Silesian) region. The threat of socioeconomic collapse of mining communities forced policymakers to provide economic assistance and prevent large-scale layoffs. The media coverage of this issue's development focuses primarily on the company's economic condition ("uncompetitive"), the outlook for the workers ("employment") and the coal-mining communities ("backbone"), and the conditions of the bailout ("phase-out management"). Interestingly, as more than 70% of instances of the "phase-out management" code are associated with OKD, it can be argued that the theme is related to keeping the coal industry afloat rather than seeking its end.

The second narrative, "Environment or employment", is connected with the issue of the mining limits in the lignite-rich northwest region. Here the storylines revolve mainly around the negative effects to the local environment of coal mining and use. The corresponding code is present in more than 70% of articles focused on the region, making it by far the most important primary code and the most salient secondary code. This narrative also includes the themes that are usually used by proponents of mining beyond the limits: the mines are portrayed as an important source of jobs in an otherwise unemployment-prone area (the "employment" code is featured in more than 30% of articles focused on

the region) and lignite as vitally important for the country's heat production and delivery system ("necessary").

The core of the narrative is the trade-off between socioeconomic benefits and environmental costs of prolonged coal production and use. The narrative has two interrelated features that determine its role in policymaking. First, it relates nearly exclusively to the northwest region and does not take into account the wider national context. After all, it is the local people whose jobs and health need to be secured and safeguarded. Second, with the exception of the role of lignite in central heating, the narrative does not feature any other attribute than jobs and the local environment. Therefore, issues such as climate change, the role of domestic coal reserves in the country's energy security, or the availability of more progressive alternatives to coal do not act as discursive constraints to the variety of choices available to policymakers.

6. Discussion: the comparative perspective

The variance in composition of a typical media article on the future of coal across the three countries appears to be driven mostly by the combination of energy-related issues the media write about and the position and image of coal in the countries' political agenda.

The main issues covered by media across the coal heartland were climate protection, energy transition, the impact of coal mining on the local environment, and the economics of the national coal industry, including its role as an employer. The German media deal mainly with climate and transition. Such focus requires longer timeframes (Fig. 18), a nation-wide perspective, and less attention paid to the peculiarities of the hard coal and lignite industries. A similar approach can be identified in Polish media, which primarily deal with economic challenges to the coal industry and their potential impact on the country's economy, social situation and energy security. Such focus corresponds with the widespread securitization of energy issues in the country [79]. In German and Polish media, the regional perspective focuses mainly on local environmental impacts. Both the theme and the perspective play only a secondary role in the agenda, however. In contrast, the issues of regional employment and local environmental impacts are what defines the content of the Czech agenda [63].

There are also subtle differences in the actors referred to by the media. In all three cases, it is the policymakers and coal company representatives who dominate the agenda (Fig. 19). Beyond those actors, however, the Czech media also reflect the viewpoints of regional politicians, echoing the importance of the regional perspective therein [63]. The German media, in contrast, tend to present the coal question in the broader perspective of energy transition and (international) climate politics [21]. As such, they refer also to foreign politicians. The Polish media, largely due to the importance of the smog issue for the left-leaning daily, facilitate a discursive platform also for representatives of NGOs. This can be attributed to the target readership and the political

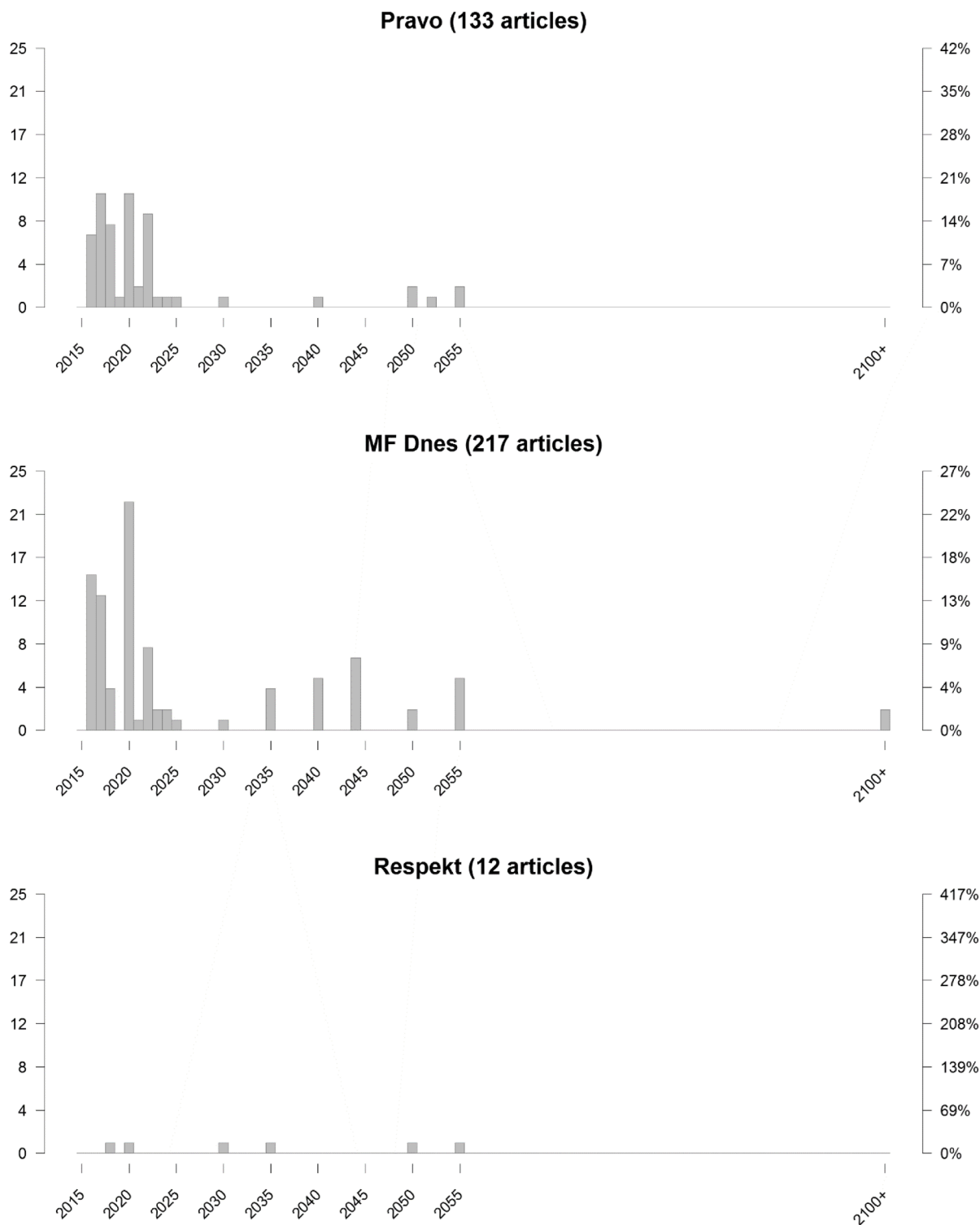


Fig. 15. Czech media: timeframe.

orientation of the main Polish newspapers. The socially conservative Rzeczpospolita adopts the perspective of the industry and prioritizes economic topics, while the progressive Gazeta Wyborcza promotes a broader approach towards coal and takes also the environmental concerns into the consideration. Similarly, the right-leaning orientation of Rzeczpospolita makes its position more aligned with that of the pro-industry Government, whereas the left-leaning Gazeta Wyborcza tends

to give voice also to the representatives of the opposition and other critics of the Government – see for example the high occurrence of Tadeusz Arkit and Andrzej Guła in the source articles (Fig. 8). This finding also somewhat informs that of Vasev [80], who argues that the industry is much more relevant in Polish decision-making than non-governmental and non-industry actors. At least in terms of access to the media, these actors are being referred to there. At the same time,

Co-occurrence of primary and secondary codes

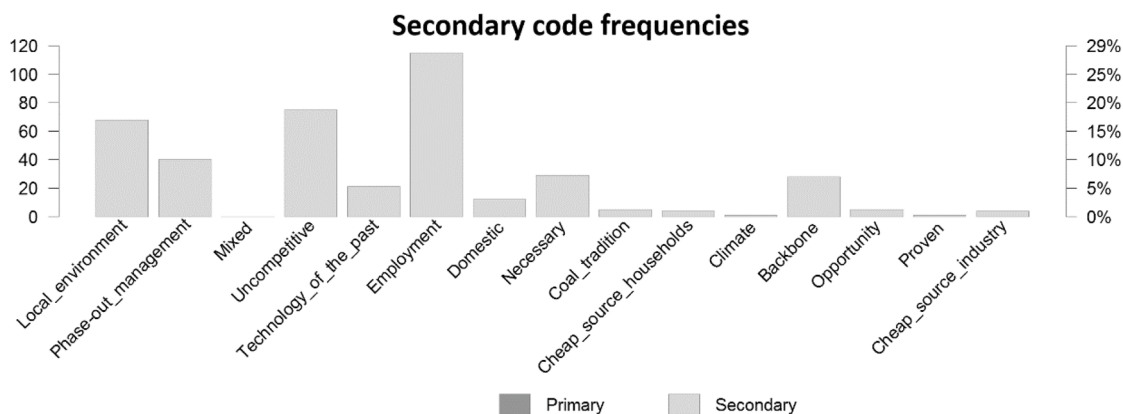
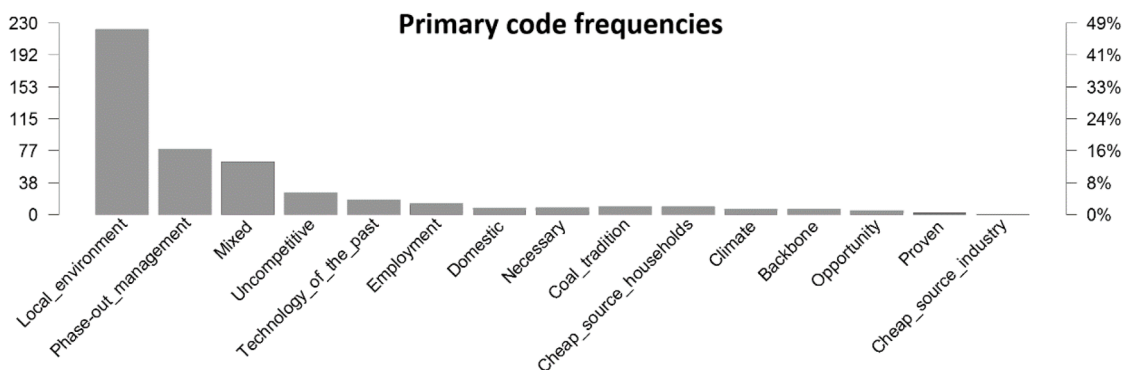
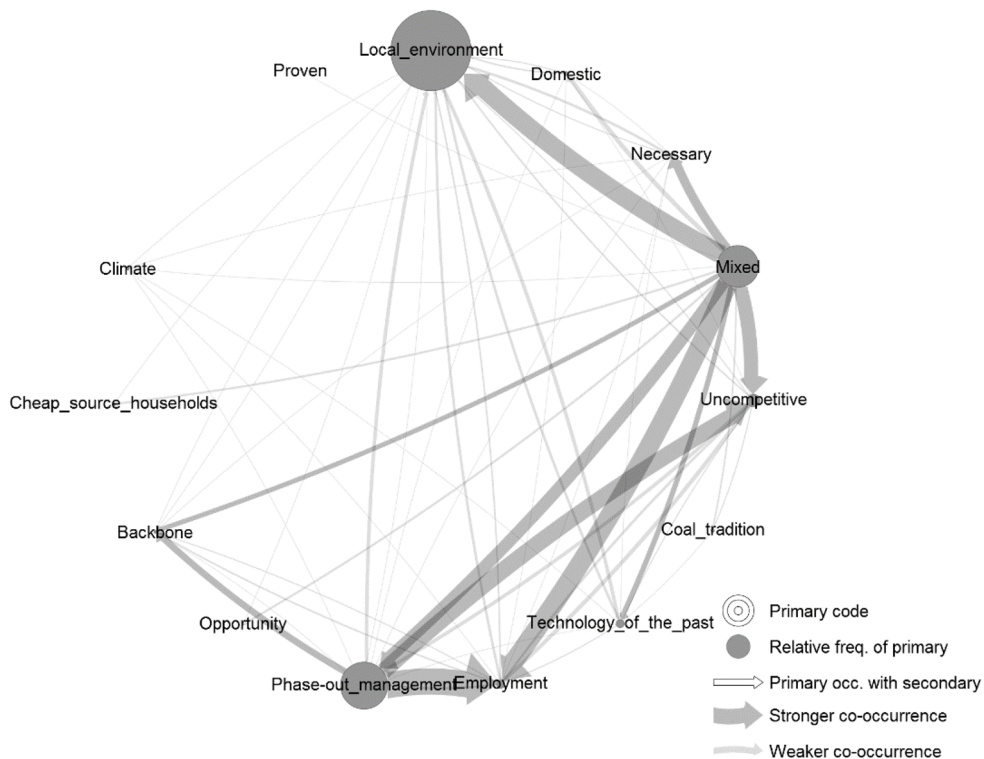


Fig. 16. Overview of thematic attributes in Czech media.

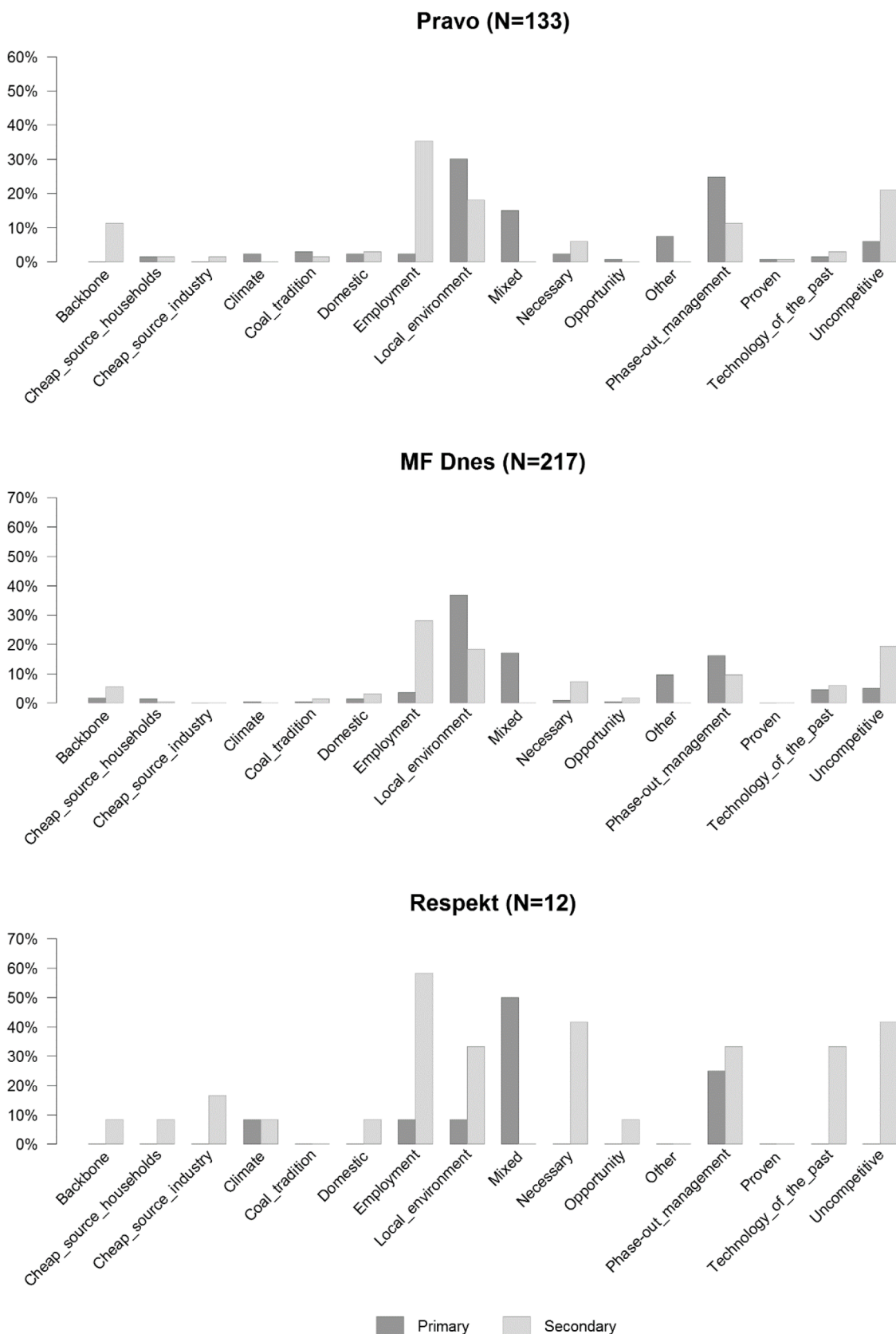


Fig. 17. Relative frequencies of codes across Czech media.

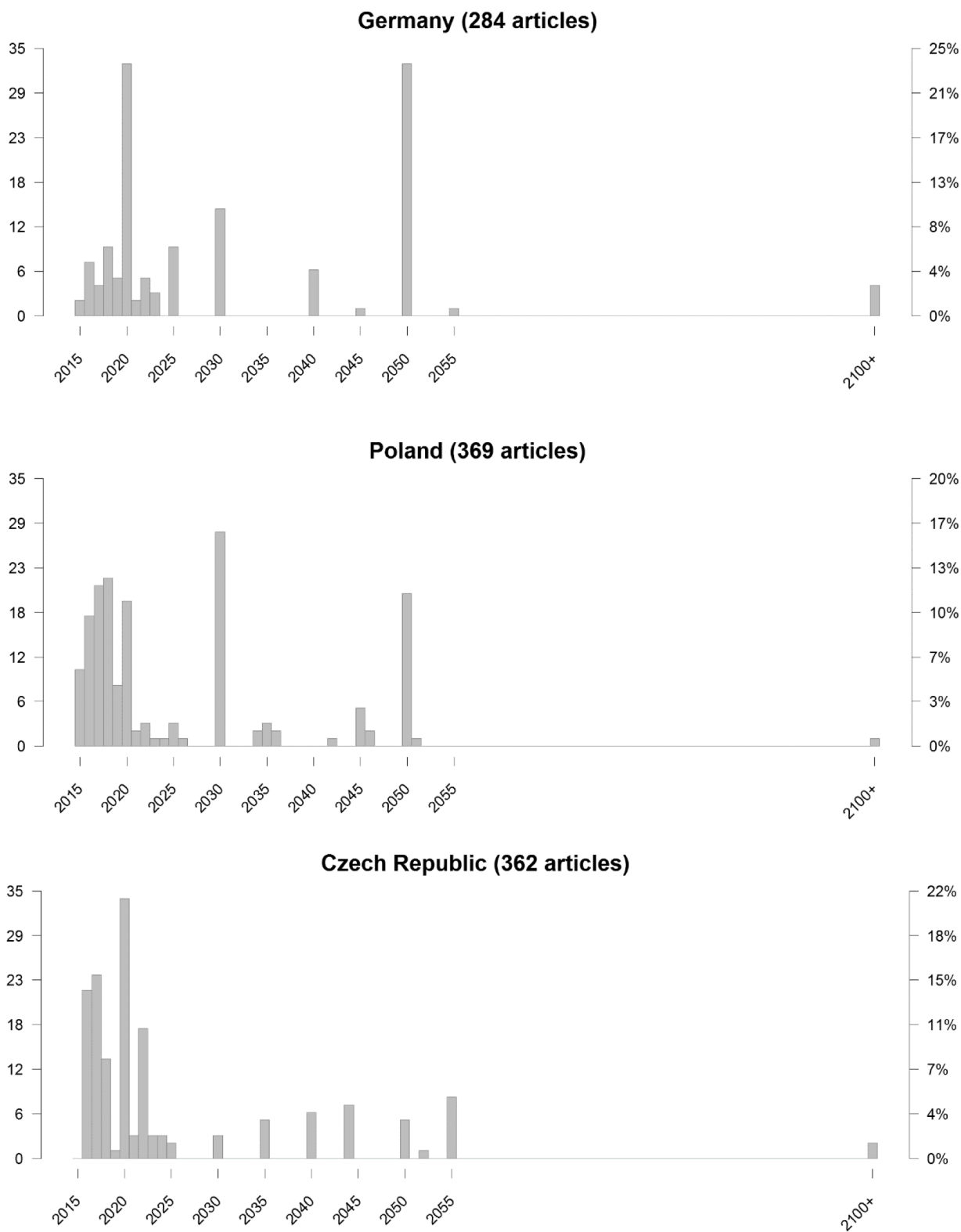


Fig. 18. Timeframe histogram of national media agendas.

however, closer inspection of the individual news stories suggests that the media are much more receptive to the pro-coal perspective of the government and the industry, which became even more entangled after the ministerial reorganization in 2015 (see Annex 2).

With regard to thematic attributes and narratives (Fig. 20), the most complex agenda can be found in Germany. Here, the media approach the future of coal via four distinctive narratives. The two prevalent

narratives (“Sustainable change” and “Technological change”) focus heavily on the country’s climate policy and its pathway towards energy transition. The mainstream agenda, set by these narratives, is broadened by those dealing with socioeconomic and environmental issues in coal-producing regions (“Local context”) and attempting to rehabilitate coal by acknowledging its importance for Germany’s energy security (“Coal defense”).

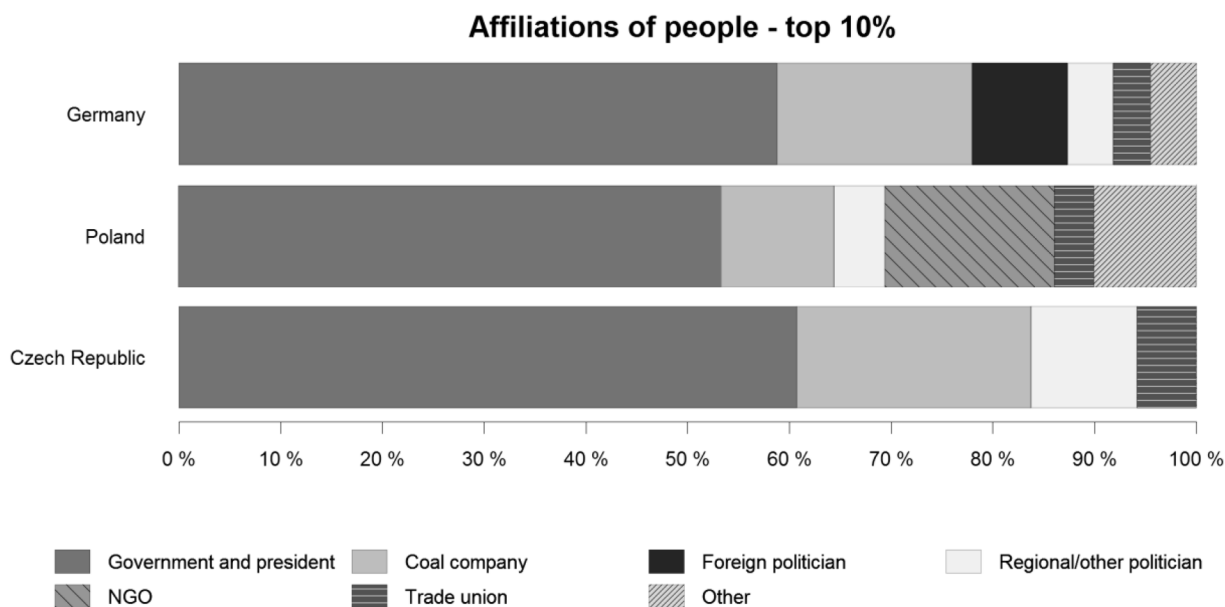


Fig. 19. Affiliations of most frequently occurring actors (top 10%).

Our analysis of the German media agenda confirms major findings of other studies, even if they differ in focus from our approach. The high salience of the climate change attribute can also be found in a survey based on a study by Joas et al. [81] that deals with views of “elite policy actors” on the goals of the German energy transition. The authors found that climate protection is considered a top-level goal of the transition, ranking significantly ahead of such other goals as providing affordable energy prices or protecting regional environments. The two dominant narratives of the German agenda can also be found in the qualitative text analysis of statements made by major political actors and stakeholders on the prospects of coal in Germany by Leipprand and Flachsland [21]. This study made a cautious statement on the destabilization of a “status quo defending” frame in favor of a “change legitimizing” frame. Our analysis shows that the media predominantly back the legitimization of change and therefore exert pressure on the two leading parties, which are somewhat reluctant to quickly transition away from coal (see Table 3 and Annex 2 for more details). However, the high salience of climate change in the agenda does not mean that the challenges of techno-social transition are downplayed. The prominence of the “Technological change” narrative, which acknowledges coal as a necessary element of the energy system while also debating instruments and tools that contribute to a reduction of coal, points to this somewhat balanced view and aligns well with the attitudes of the main parties. To some extent this confirms Buschmann and Oels’ review of the representation of “carbon lock-in” in scientific journal articles [82]. They claim that the “energy transition discourse” became hollowed out by complaints about energy prices and energy security, which contributed to “continuing carbon lock-in”. However, our analysis allows for the assessment that, while the problems of a coal phase-out are taken into account, the media do not legitimize carbon lock-in in a comprehensive fashion.

Like their German counterparts, the Polish media also reflects coal mainly from a national perspective and includes the climate issue into the debate. However, although the Polish media acknowledge coal’s adverse climate effects, they argue in favor of preserving the status-quo while calling for cleaner and more efficient ways of using the resource [37]. The use of low-quality coal and resulting smog issues appear to be more salient environmental problems, especially in the left-leaning newspaper. Also, solutions to this problem are found within the industry, through the introduction of coal quality standards and more efficient boilers.

The industry itself is generally viewed as an integral part of Poland’s energy system, economy and, in a wider sense, Polish society for the years to come. It therefore does not come as a surprise that the economic difficulties and threat of socioeconomic turmoil in coal production regions resulted in wider national discussions and impacted the national elections of November 2015, enabling PiS to gain an absolute majority after making a pledge to coal miners not to close a single mine [83] (see Table 3 and Annex 2 for more details). The overall course of the country’s climate and energy policy did not change with the elections, however. Both Ewa Kopacz’s and Beata Szydło’s governments supported the coal industry and held critical views regarding European climate policy [84,85], with the position of the Szydło government being close to downright climate skepticism [86].

The results of our analysis support the assumption of continuity in the approach towards coal by the two governments. Upon closer examination of the frequencies of thematic structures before and after the elections, we noticed no considerable differences. This suggests that the government transition did not affect the ways coal is thematized in the media. Throughout the analyzed period, coal-supportive narratives dominated the agenda. The economic challenges that the industry is facing (see Annex 2) are not presented as incentives for the eventual substitution of coal in the country’s energy mix. Instead, they are seen as a non-desirable outcome of an unconsolidated coal sector, whose restructuring process eventually became one of the new government’s key energy programs [87]. As such, the challenges are presented as an opportunity to modernize and reinvent the industry and effectively ensure its future viability.

The Polish media also emphasize the energy security theme the most. (Domestic) coal is seen as a material guarantee of Polish energy sovereignty and of security and continuity of energy supply. This idea, which in Germany serves as a reminder that coal may still have a useful role to play, constitutes one of the distinctive building blocks of the Polish “Coal continuity” narrative [88].

Interestingly, the climate issue, which is central to the German agenda, is entirely missing in the Czech agenda. The news stories present coal as if the climate issue was not entangled with it, and almost never is the climate issue directly reflected by policymakers or company representatives as a factor influencing their decisions. Tellingly, of the 362 articles on the future of coal published six months before and after the sealing of the Paris agreement only six somehow reflect the agreement and for only two of them is it their primary focus. Instead,

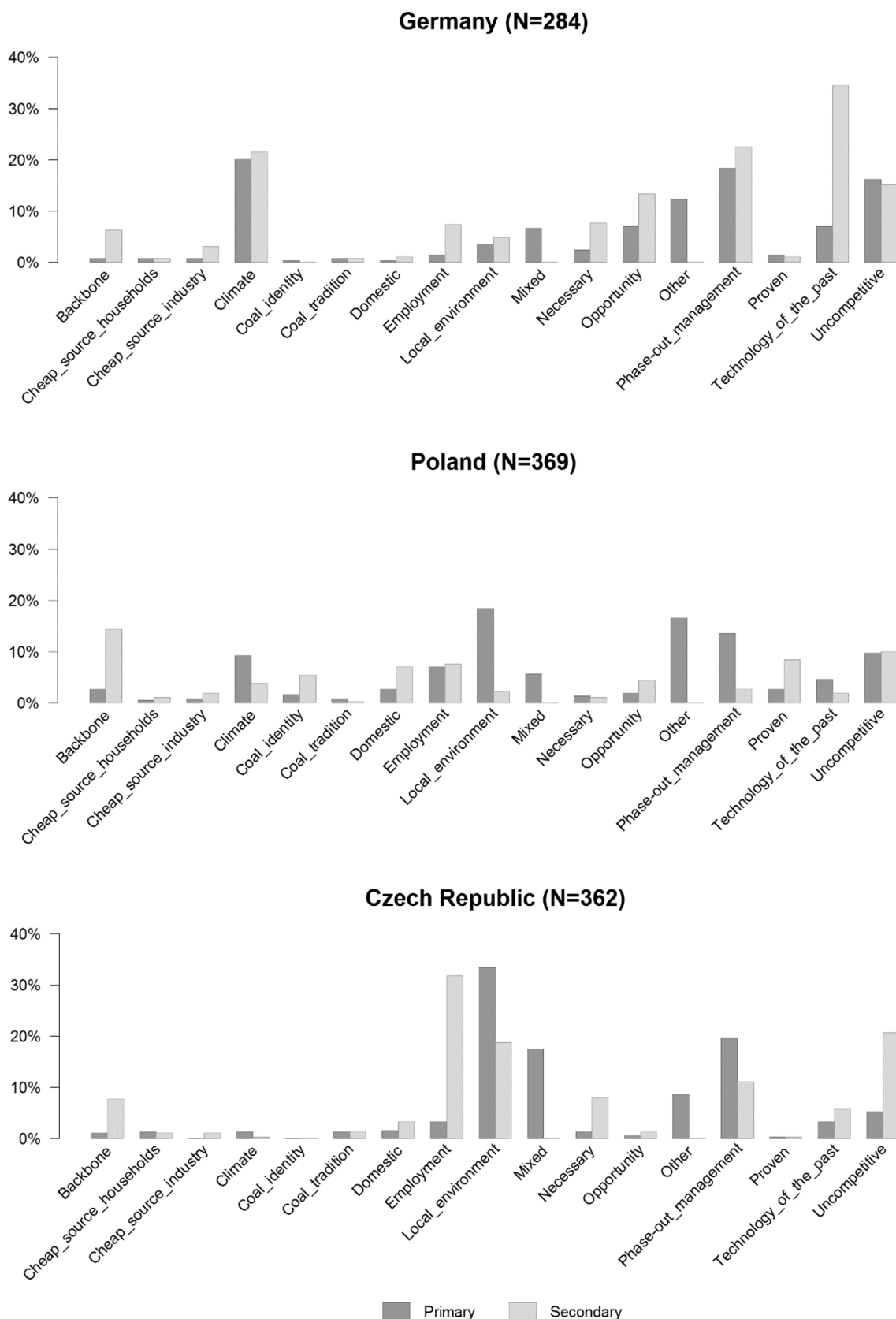


Fig. 20. Relative frequencies of codes by country.

the Czech media present the coal question as a rather narrow dilemma between the local environment and local employment (the “Environment or employment” narrative) with the issue of jobs being

highlighted in nearly all stories featuring the interaction between government and industry.

These results are in line with Lehotský et al. [63], who point out that

the Czech media disentangle coal mining from the environmental problems arising from its use and that economic problems of private companies are often seen as public problems. Indeed, a closer look into the articles dealing with possible closure of coal mines (the “phase-out management” code) reveals that they discuss mostly the means of saving the industry, not planning its demise (the “Damage control” narrative).

Notably, Czech media rarely discuss the future of the coal industry in general. Instead, they mostly focus on rather particular issues at the regional level. There are also negligible differences across the inspected media. The script attributes of both newspapers adopt a very similar geographical focus, show similar emotional charge, and refer to nearly the same set of actors. The two newspapers also overlap in thematic attributes. Furthermore, the newspapers do not seem to develop an agenda of their own, as their reporting is mostly limited to a brief introduction of the issue at hand followed by a reflection of stakeholder opinions. Critical discussion or alternative opinions are seldom present. A few articles offering such perspectives can be found in the weekly magazine, but the limited coverage of the issue does not allow for a well-founded interpretation.

The Czech media agenda thus remains interesting for what it does not cover. Not only does it omit the issue of climate change or a more thorough discussion of the future of the industry as such, it also largely ignores the issue of energy security, which is otherwise highly salient in the country's general energy discourse [89,90]. Similarly, the role of coal in the national energy system [91,92] is, with the exception of heat supply, largely omitted by the media. Finally, the issue of coal communities and coal culture [13] is either perceived through the narrow lens of the employment question or entirely absent in the agenda.

7. Conclusions

In this article, we mapped and compared the coverage of the future of coal in the major print media in the countries of the European coal heartland. Specifically, the research identified the attributes the issue of coal consists of in the source articles (research question 1), the salience of these attributes (RQ2), and the narratives through which coal is thematized (RQ3). Furthermore, the article presents some insights into the wider political context governing coal in the region (Section 2 and Annex 2), which, alongside the theoretical assumptions about media effects, contribute to deriving the implications that the structure of media coverage might have for policymaking (RQ4).

The analysis revealed profound differences in composition of the media agendas across the region. Our findings show that similarities in the structural setting of the industry do not translate into similar issues being presented in a similar manner. On the contrary, the three investigated agendas diverge significantly, suggesting that the ideational component of the issue prevails over the material one.

With regard to RQ1 and RQ2, the results show that media coverage tends to discuss mainly the big questions associated with coal in each country. The German media closely follow the issue of coal phase-out, a question that has been discussed at least since the 2007 decision to end subsidies for hard coal mines. The media adopt a very general perspective of the coal industry as a whole, include the international dimension of the problem by referring to foreign leaders, operate within longer timeframes, and thematize coal mainly through the effects on climate and through discussion of possible phase-out policies.

The Polish and Czech media adopt more inward-looking perspectives. They both select shorter timeframes and pay significant attention to the economic hardship of hard coal producers, echoing policymakers' concerns about the socio-economic consequences of a decline in mining. They differ in other features, though. The Czech perspective is mainly regional. It emphasizes mainly the local environment and local employment attributes while largely ignoring all other themes that the other agendas and the secondary literature associate with coal, such as climate effects or energy security. The Polish perspective approaches

the issue from both national and regional perspectives. In general, it highlights the importance of coal for the Polish economy and society, mobilizes support for the industry, and calls for its renewal in order to address the most striking economic and environmental problems.

As far as the narratives (RQ3) are concerned, it appears that across the region the media accept the dominant energy policy paradigms and amplify them. The German agenda, despite its complexity, is rather unified across the investigated media and in the patterns of meaning they promote. The media coverage prepares for a carefully orchestrated coal phase-out (the “Climate change” narrative) without downplaying possible challenges (the “Technological change” narrative). The media coverage identifies no obstacles to a medium- or long-term phase-out of coal from the energy mix. The “Coal defense” narrative provides some counterbalancing arguments to the leading narratives but does not appear strong enough to legitimize a coherent alternative to the phase-out policy.

In Poland, the media echo the communist-era “Poland stands on coal” slogan and present the issue mainly through the “Coal continuity” narrative. The narrative suggests that coal cannot be phased out and its further use is inevitable. The media acknowledge and thematize the negative consequences associated with the use of coal (such as climate change or, in the case of the left-leaning *Gazeta Wyborcza*, the smog problem) but do not see them as problems to be solved by restricting the coal supply. All media view and present coal as simply too important for the Polish energy system, economy and society to be reduced beyond the economic optimization of the industry.

The Czech media do not openly favor either continuation or abandonment of coal. They stress both the importance of local environmental impacts of open-pit mining and the issue of employment in the industry. The media therefore cultivate a discursive environment in which future coal policies could head either direction, depending on which theme of the “Environment or employment” narrative policymakers decide to emphasize. Interestingly, current media coverage does not allow for ambitious coal policies justified by climate or energy security concerns.

Finally, concerning the political implications of media coverage (RQ4), our analysis shows a stark contrast between the similarity of (certain) structural conditions of the coal industry and the diversity of the media coverage of coal in the three countries. The three national coal industries have undergone very similar historical development. They all were the backbone of industrial and economic development of the respective countries. They all faced structural problems when exposed to international competition but have remained important and influential components of the countries' economies till today (see Annex 2). They have also faced similar external pressures, be it in the form of competition or environmental and climate concerns.

The differences in media coverage can therefore be attributed either to the processes through which the media agenda is formulated or to those components of energy governance in which the countries differ. With regard to media agenda formulation, the results of the analysis suggest that the media mostly provide a platform for the countries' decision-makers and energy policy stakeholders to voice their perspectives. Their direct effect on the political process therefore lies mainly in acting as a conduit for policy participants rather than as an active contributor [93]. This appears to be especially the case of the Czech media, which tend the most to refer to policymakers and industry representatives and to structure narratives along the lines of their statements. This informs the findings of Robinson [94], who differentiates between media as “manufacturers of consent for elite policy preferences” [95] and media as “policy contestants” [96] and argues that the media's role in the political process is more significant when policies have not yet been decided. Such has clearly been the case in the Czech Republic, and yet the Czech media showed arguably the least interest to contribute to the political discussion. The German and Polish media, on the hand, show at least some agency over the agenda formulation, especially in developing the narratives. The German media

are generally more progressive on the issue of coal phase-out than the dominant political forces in the country. The Polish media, at least when compared with the Czech media, tend to add more narration to the news stories. The tendency of the Czech media towards “plain reporting” can be illustrated on the average range of a newspaper article which is 473 words in the case of the Czech media compared to 671 and 650 in the German and Polish media respectively.

Concerning energy governance, the main difference lies in the approaches of the respective major political forces towards the issue. While in Germany all major parties have accepted the necessity to phase out coal and differ only in how fast and at what cost this should be done, the main Polish political parties agree on the necessity to keep the coal industry alive and differ only in how explicitly they support the industry and how fiercely they oppose EU climate policies. In the Czech Republic, all major parties either have an unclear stance on coal or are split across the industry–environment internal cleavage (see Table 3 and Annex 2). These positions are likely influenced by perceptions on coal alternatives. While renewable energy is widely accepted by the German elites as a viable substitute for conventional energy sources [21] and the Czechs widely embrace nuclear energy as the source of choice [90], neither of these alternatives appears viable in the Polish context [97,98], making it more difficult for the elites to approach coal differently.

It is only natural that when left to policymakers to fill its content, the media coverage of coal reflects their preferences. As a consequence, the prevalent media agenda simultaneously enables and constrains policy options by promoting the elites’ perspectives and preventing alternative views from surfacing [88]. In this sense, our analysis shows that the media coverage facilitates the coal phase-out in Germany while clearly acting as an inhibiting factor in Poland. Polish policymakers are expected to remain committed to domestic coal and refrain from pursuing alternatives. External influences, like European climate goals, will be mediated by this principal commitment to domestic coal. In the Czech Republic, the media agenda allows for both continuation in the use of coal and its faster abandonment, which reflects well the as yet undecided issue of the future of the territorial mining limits in the northwest part of the country. In such a balanced policy environment, the future of coal is likely to be determined to a much greater extent by individual policymakers, external factors, as well as the media, should they opt to play such role.

Drawing on these conclusions, considerable follow-up research opportunities arise. First, a hypothesis that assumes that the media indeed act as consent manufacturers could be tested. The formation and formulation of media agendas in each country could be inspected and the channels through which events become “newsworthy” [99] explored and mapped. Alternatively, media content can be approached as an independent variable [100] and its effect on the public agenda could be inspected. Additional research could investigate the “proxy effect” [45,53] by linking media content with policymakers’ understanding and framing of the issue. The presented analysis also invites further exploration focusing on the key actors who influence the future of coal, such as policymakers, interest groups’ representatives, and experts and advisors. Relevant questions include: Who are these actors in each country? What are their positions in the landscape of energy politics and their roles in the political process shaping the future of coal in these countries? How do these actors interact? How do they perceive the issue? How do they frame it in their public statements? Which imaginaries of the issue do they formulate or promote? The range of possible research questions is quite broad, from intimate ethnographic studies following interactions with expert advisory groups to large-scale social network analyses of actors, coalitions and patterns of meaning which together make up for the political landscape governing coal.

Declaration of Competing Interest

The authors declare that they have no known competing financial

interests or personal relationships that could have appeared to influence the work reported in this paper.

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Supplementary materials

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