Energy Research & Social Science 58 (2019) 101283

Contents lists available at ScienceDirect

Energy Research & Social Science

journal homepage: www.elsevier.com/locate/erss

Original research article

A contested transition toward a coal-free future: Advocacy coalitions and coal policy in the Czech Republic

Petr Ocelík[a,b,*], Kamila Svobodová[c], Markéta Hendrychová[d], Lukáš Lehotský[a], Jo-Anne Everingham[c], Saleem Ali[c,e], Jaroslaw Badera[f], Alex Lechner[g]

[a] Department of International Relations and European Studies, Faculty Social Studies, Masaryk University, Joštova 218/10, 602 00 Brno, Czech Republic
[b] International Institute of Political Science, Faculty Social Studies, Masaryk University, Jostova 218/10, 602 00 Brno, Czech Republic
[c] Centre for Social Responsibility in Mining, Sustainable Minerals Institute, The University of Queensland, St Lucia, Queensland 4072, Australia
[d] Czech University of Life Sciences, Faculty of Environmental Sciences, Department of Land Use and Improvement, Kamycka 1176, Prague 16500, Czech Republic
[e] College of Earth, Ocean and Environment, University of Delaware, 272 The Green APT 111, Newark, Delaware, 19716, USA
[f] Faculty of Earth Sciences, University of Silesia, 41 - 200 Sosnowiec, Poland
[g] School of Environmental and Geographical Sciences, University of Nottingham Malaysia, Semenyih, 43500, Malaysia

1. Introduction

Energy transition to a low-carbon economy is one of the most pressing and complex challenges that modern societies face globally. In this context, coal has been recognized as a reliable and cheap source of energy from the very beginnings of the industrial revolution and a backbone of traditional energy industries [1]. Nevertheless, it is now considered to be one of the major anthropogenic drivers of greenhouse gas emissions [2]. Thus, the European Union's policies aim to phase out coal production in the next 25 to 50 years and require member state governments as well as regional authorities to engage in the energy transition [3]. Besides regulation, the decline in coal demand is further strengthened by increased competition from renewables and unconventional natural gas resources, which are pushing coal out of the North American market [4]. These trends generate landscape pressures impacting member states where involved policy actors and their coalitions compete in uncertain environments over the formulation of specific transition pathways [5,6]. In this respect, coal dependent countries that have not yet adopted phase-out strategies stand at a decisive point when key decisions on how quickly and by what means to transform their carbon intensive energy industries need to be made. As Markard et al. [7] reported, research on the political dimension of such changes has emerged only recently (see e.g. [8–11]). We aim to contribute to this research using the *Advocacy Coalition Framework* [12,13] to explore interactions among policy actors within the context of a specific *policy subsystem*—an issue-defined network of actors within juridical and geographic boundaries [14].

Pursuant to the Advocacy Coalition Framework [15], landscape pressures such as macroeconomic trends or supranational regulation are understood as *external perturbations* that impact policy subsystems in terms of resource redistribution, available opportunities for minority coalitions, or belief changes in the dominant coalition [14,16,17]. Of course, not every external perturbation results in a major policy change (cf. [14]). It is regarded rather as a necessary but not sufficient condition of such change, and its effects are not independent of the subsystem's internal functioning [19,20]. Thus, investigating the particular mechanisms that mediate the effects of external perturbations is essential to better understand of policy change [16,17,21]. More specifically, we focus on three such mechanisms: fragmentation of political authority [22], access to political authority [23,24], and use of expert information [25]. *First*, a policy change needs to be accepted by policy actors with formal decision-making authority. The degree of fragmentation in terms of the decision-makers' beliefs and their coalition affiliations thus affects opportunities for such change [21,22,26]. *Second*, other involved policy actors compete to access the authority in order to influence policy decisions [23,27]. *Third*, use of expert information is an integral part of the policy process with important impacts on potential policy learning—a key pathway to policy change [25,28]. It is also assumed that *outcomes* of the mechanisms depend on the type of policy subsystem. In this research, the context is that of an *adversarial* policy subsystem constituted by competing advocacy coalitions with incompatible beliefs and prevalently within-coalition coordination patterns [22]. As a specific case, we focus on the Czech Republic, where the future of brown coal (henceforth "coal") has been intensively contested since the 1990s [29] (see Section 4). We assume that the Czech Republic represents a typical case of coal phase-out in an adversarial policy subsystem.

The overarching research question is the following:

RQ: *How do policy actors and their coalitions interact to influence coal policy in an adversarial subsystem?*

* Corresponding author at: Masaryk University, Jostova 218/10, 602 00 Brno, Czech Republic.
E-mail addresses: petr.ocelik@gmail.com (P. Ocelík), k.svobodova@uq.edu.au (K. Svobodová), hendrychovam@fzp.czu.cz (M. Hendrychová), llehotsky@mail.muni.cz (L. Lehotský), j.everingham1@uq.edu.au (J.-A. Everingham), saleem@udel.edu (S. Ali), jaroslaw.badera@us.edu.pl (J. Badera), Alex.Lechner@nottingham.edu.my (A. Lechner).

https://doi.org/10.1016/j.erss.2019.101283
Received 23 December 2018; Received in revised form 25 August 2019; Accepted 1 September 2019

To that end, we apply social network analysis to survey data collected on the coal policy subsystem. Our contribution is twofold. First, we connect Advocacy Coalition Framework with concepts from the socio-technical transition literature thereby enabling us to theorize on potential impacts of policy change, or its absence, within a broader context of the Czech energy industry. Second, we address limitations of the advocacy coalition detection techniques and offer an approach that considers belief and relational elements of coalitions equally.

The article starts by introducing the Advocacy Coalition Framework and then elaborates on theoretical arguments and derives hypotheses focused on the mechanisms described above. Next, we describe the data and methods, which rely mostly on descriptive and exploratory social network analysis techniques [30]. The next section provides background information on the Czech case. The results indicate the presence of two antagonistic coalitions that compete for access to a fragmented political authority and exchange expert information primarily among their members. In conclusions, it is expected that such conditions will facilitate the overlay of newly adopted policies on the existing core of the regime, thus hindering any major policy change towards a rapid phase-out.

2. Theory

2.1. Advocacy Coalition Framework

The Advocacy Coalition Framework is based on the assumption that policy problems in modern democratic societies are contested by diverse actors and coalitions of actors which advocate specific solutions. Analysis of the advocacy coalitions is thus crucial to understanding the policy process [14,28]. Coalition politics occur at the level of a *policy subsystem* which is a subset of a political system defined by an issue area [31,32]. An *advocacy coalition* (henceforth "coalition") is thus defined as a group of actors that (1) share *policy core beliefs* and (2) engage in a *coordinated activity* [19,33]. The degree (dis)similarity among policy core beliefs and the prevalent coordination patterns define different subsystem types, specifically: unitary, collaborative, and adversarial (see [25]). In this research, we focus on an *adversarial subsystem* defined by competing coalitions with low-compatible policy core beliefs and dominant within-coalition coordination patterns [25]. The first element, *policy core beliefs* (PCBs), constitutes a set of normative assumptions about how the subsystem ought to be organized. They are highly salient and produce cleavages within a subsystem for some time [14]. The second element captures *interactions*, often informal, among actors. The interactions are driven by, among other things, *an exchange of information* that relates to substantive policy issues and political efficacy [34], which is especially important in the case of complex problems as well as under conditions of risk and scientific uncertainty [35,36]. Other drivers include *alliance formation* through which actors seek to exchange various resources and *access to political authority* through which actors influence other actors with decision-making competencies [24,37]. Thus, the relational structures fundamentally condition the characteristics and capabilities of the coalitions [31,38].

In this research, we focus on two types of interactions: *political cooperation* and *expert information exchange*. The former rests on the assumption that policy actors use different ways to translate elements of their belief systems in order to influence the policy process before their opponents can do the same. For this purpose, they seek allies and share resources [14]. We therefore define *political cooperation* as an activity that does not necessarily require a common objective or joint planning and that might range from "support on a policy issue, support of other organizations in/through international organizations or professional associations, working together to find a solution of a policy problem … [to] joint official statements, joint lobbying, co-organizing campaigns and protests" (Appendix A). The Advocacy Coalition Framework further assumes that the policy actors will seek allies among actors who hold similar PCBs. The general expectation is that cooperation patterns overlap with the clusters based on those beliefs [14,31]. Thus, relations based on political cooperation are used to identify coalitions [39,40]. *Expert information* is defined as information of a technical, scientific, or process character related to the coal subsystem. The distinction between expert and political information is, of course, not clear-cut. Especially in the case of evidence-based policy making, the production and exchange of expert information is an integral part of the political process that involves making claims about what the policy makers should and should not recognize as evidence [41].

Coalitions are also defined by other attributes (such as coalition membership and size, resources, or within- and cross-coalition activity) which further influence their ability to achieve their objectives [32,42]. The distribution of reputational power within the subsystem is captured as a reported "ability of the organization formally … and/or informally … to change the results of the processes of creation, implementation, and evaluation of the policies" (Appendix A; cf. [23,42,43]).

Applications of the Advocacy Coalition Framework to energy policies range from identification of coalitions and their properties [44–49], evaluations of external shocks and crisis policymaking [16,17,50], energy transition [7], drivers of policy agreement [51], policy change [42,52], and impacts of the institutional context on policy outcomes [53] to related research on discourse coalitions [18,54–57]. Ingold et al. [51] argue that issues of energy policy can be characterized as a conflict between mostly right-wing actors with economically liberal core beliefs against left-wing and environmental actors (cf. [58]). This cleavage can be further strengthened in mature subsystems [14] such as coal mining, where actors hold clearly articulated ideological positions and the power structure of the subsystem is well-established. As a result, two coalitions, one favoring economic efficiency generated by the free market and the other supporting state interventions to protect the environment, are usually present [32,51]. This is consistent with the expected coalition structure in adversarial subsystems as hypothesized by Weible et al. [25]. Considering the above, we formulated the following hypothesis:

H1. Two coalitions with distant policy core beliefs are expected to be present in the policy subsystem.

Drawing on Weible et al. [25,59] we also focus on three particular mechanism *outcomes* hypothesized to be present in an adversarial subsystem: (1) *fragmented* political authority; (2) *competitive access* to political authority; and (3) prevalently *within-coalition patterns* of expert information exchange.

2.2. Fragmentation of political authority: divided we govern

The first investigated mechanism is the degree of fragmentation within the political authority. Weible et al. [25] define (political) *authority* as legitimized power to create and enforce institutional rules. In adversarial subsystems, political authority is fragmented between and also *within* the subsystems thereby facilitating coalition competition [25]. Moreover, mining policies in general are of a regulatory character and thus directly impact well-organized interests in society. As a consequence, they tend to foster conflict rather than cooperation [60,61]. In this context, we focus on actors that have decision-making competencies and provide institutional support throughout the policy process. These capacities are distributed among *ruling political parties* that function primarily as "transmission belts" between organized interests and policy outcomes as well as competent *government offices* and *ministries* mainly responsible for specific policy designs and their execution. We call this actor group "decision-makers". Considering the above, we formulated the following hypotheses:

H2. The decision-makers are expected to be fragmented across coalitions in the policy subsystem.

H3. The decision-makers are expected to have higher variability of policy core beliefs in comparison to the other actor groups in the policy subsystem.

Thus, the degree of fragmentation is captured at the level of decision-makers' memberships (H2), i.e. whether different decision-makers belong to different coalitions (or potentially to a residual actor group), and at the level of policy core beliefs variability (H3). Thus, we expect cross-coalition memberships and large variability of PCBs. This would consequently limit policy change through policy learning or negotiated agreements since coalitions are able to block each other and likewise any single actor or coalition is prevented from controlling the decision-making process [62].

2.3. Access to political authority: targeting the decision-makers

The second investigated mechanism is access to political authority through *targeting of decision-making actors*. In adversarial subsystems, coalitions compete to access this authority and influence policy decisions to make them consistent with their own PCBs [22]. The targeting is done mainly by the coalitions' principal members who are central to the coalitions and coordinate the majority of their activities [22]. In line with Ingold et al. [51], we expect that the principal members of the competing coalitions are mostly environmental NGOs (ENGOs) and industry actors. In relation to ENGOs, this assumption is further substantiated by the concept of *transactional activism* [63]. It assumes that organized non-state actors rely mostly on their capacity to develop enduring as well as temporary relations among themselves and towards power-holding institutions [63–67]. As Čada and Ptáčková [64] argue, the legitimacy of transactional NGOs is not based on active membership but on epistemic sources such as scientific knowledge and expertise. These NGOs then pursue their objectives through collaborative planning with public authorities [64] and issue advocacy [67], among other things. Thus, we expect that ENGOs use targeting of decision-makers by extending political cooperation ties as well as through the provision of expert information (cf. [63–65,67]). As Geels [68] suggests, industry actors likewise engage in *instrumental* interactions, such as lobbying and consultancy, to support policies that preserve their vested interests. Thus, we expect to find the same patterns of political cooperation and expert information exchange for industry actors as well. Considering the above, the following two sets of hypotheses were formulated:

H4a. Environmental non-governmental organizations are expected to send more political cooperation ties to decision-makers as compared to the overall average.

H4b. Industry actors are expected to send more political cooperation ties to decision-makers compared to the overall average.

H5a. Environmental non-governmental organizations are expected to send more expert information ties to decision-makers as compared to the overall average.

H5b. Industry actors are expected to send more expert information ties to decision-makers as compared to the overall average.

Targeting aims at gradual policy change (ENGOs) or its prevention (industry actors) and also counteracts parallel activities of the opposing coalition. This would lead to further fragmentation among decision-makers and consequently limit the potential for policy change through policy learning or negotiated agreement.

2.4. Expert information: tell me I am right

The third investigated mechanism is the use of *expert information*. From an instrumentalist perspective, expert information is considered crucial to the improvement and quality of policy outputs at the expense of ideology and derived values [69,70]. As a result, policymaking is seen as an expert consideration of feasible and efficient solutions within the given constraints of a system (cf. [71]). It is visible even more in the case of energy policy, which has traditionally been framed as a technical issue requiring expert, apolitical information [72]. In this view, expert information exchange could be seen as an activity that bridges the ideological and political differences between competing actors and coalitions. Contrary to this interpretation, the Advocacy Coalition Framework literature suggests that actors and coalitions often engage in expert debates to support their policy positions [15,22,41,73]. Moreover, the importance of expert information increases under conditions of uncertainty, risk or controversy [41,74,75]. In adversarial subsystems, experts serve as principal allies or opponents of coalitions and expert information tends to follow within-coalition interactions [25]. Considering the above, we formulated the following final hypothesis:

H6. The density of expert information exchange ties in the policy subsystem is expected to be higher within the coalitions than across them.

We expect that expert information exchange tends to overlap with political cooperation and occurs more within than across coalitions. This would increase the cohesiveness of coalitions rather than facilitate brokerage and consequently limit opportunities for cross-coalition policy learning [76].

3. Data and methods

The research is a single-case study – of the Czech coal policy subsystem – with within-case variation [77]. It was selected as a typical instance of adversarial policy subsystem that is characterized by presence of coalitions holding low-compatible policy core beliefs that compete to influence the policy-making process [59] (for more details, see Section 4).

3.1. Data

The data was collected from an online survey conducted in the second half of 2017. The definition of the network boundaries used a standard combination of positional, decisional, and reputational approaches [38,78]. The preliminary list of policy actors was formulated based on a literature review [29,79] and previous research of the authors [80–82]. In this step, the positional and decisional approaches were applied. The resulting list was used in an expert survey for further evaluation based on a reputational approach. We asked experts from different fields ranging from industry, state institutions and ENGOs to academia to evaluate the political influence of the listed organizations in the coal subsystem. In addition, we conducted five expert interviews along with the expert survey. Based on this data, we finalized a list of involved policy actors that consisted of 83 organizations (for the complete list, see Appendix A). The pretesting of the survey included respondent debriefing and a pilot study. The pilot study did not use samples from the target population due to concerns about overburdening the respondents. We received 24 responses, which were then analyzed to refine the four introduced Likert scales.

The questionnaire consists of three sections measuring (1) belief systems, (2) interactions of the policy actors and (3) contextual information (for more detail, see Appendix A). It is designed to a large extent based on the questionnaire outline of the *Comparing Climate Change Networks* project [40]. The first section includes measures of core beliefs and policy core beliefs. The core beliefs scale was adopted from previous research on mining policies [51,53]. The PCBs scales were initially constructed based on the literature review and then further developed based on expert consultations and the pilot survey. We calculated the simple sum of all items for each dimension and rescaled the scores from 0 to 1 to maximize clarity of interpretation and readability [42]. The ordinal alpha [83] scores for the scales range between 0.78 and 0.82 (for more details, see Appendix B).

Relational data was collected for *political cooperation, expert information exchange*, and *political influence* (see Appendix A). The resulting networks consist of directed binary ties. The *political influence* network was used to construct a reputational power measure. It simply expresses the relative frequency of political influence indications for

Table 1
Response rate based on actor type.

Actor type	Responded	Total	Response rate (%)
Central and regional governance	16	16	100
Central and regional political parties	16	18	89
Environmental non-governmental organizations	8	9	89
Research organizations	14	16	88
Professional associations and trade unions	3	7	43
Industry	11	17	65
Total	68	83	82

each policy actor by others. This corresponds to the in-degree centrality of the policy actor in the political influence matrix. The measure ranges between 0 and 1 after normalization [42].

The respondents were representatives of the listed organizations. The response rate was 82% (for more details, see Table 1). Of the 15 non-responses, 2 organizations claimed that they were not active in the coal subsystem. Due to the risk of a low-response rate indicated in the preliminary expert interviews, we decided to code the actors in a way that enables recognition of only the type of actor but not their identity. The only exceptions were ministries and the Office of the Government's Office (with their approval).

3.2. Methods

Social network analysis (SNA) was used as a methodological framework [30]. We have applied standard descriptive measures to evaluate *political cooperation* and e*xpert information exchange* networks at the global, sub-group, as well as node levels (see Appendix B).

To test our expectations regarding coalition structure (H1), we used a combination of two exploratory techniques: (1) cluster analysis applied to *PCBs* and (2) faction analysis applied to the *political cooperation* network. First, we applied cluster analysis based on K-means to (1) identify clusters of actors that share PCBs. To validate the solutions, we used silhouette width, which measures the distance between observations within one cluster compared to another and also within cluster distances [84]. Values can range between −1 and 1, where positive values indicate that the observations lie well within their clusters and negative values indicate the opposite, i.e. potential misclassification. Since coalitions are also defined by higher density of within-group interactions as compared to cross-group interactions, we used the faction analysis procedure in UCINET [85] to (2) detect such relationally cohesive subgroups [42]. The procedure requires to define the number of detected factions a priori. We estimated solutions with 2 to 6 factions and evaluated them according to their substantive and theoretical interpretability as well as statistical goodness of fit (see Appendix C). The latter measure is a proportion of correctness that accounts for the total number of errors associated with absent within- and present cross-faction ties [42,85]. The coalitions were then identified as intersections of the results of the (1) K-means cluster analysis of PCBs (2-clusters solutions; silhouette = 0.37) and (2) faction analysis of the political cooperation network (3-factions solution; correct proportion = 0.715). We also applied other clustering techniques to check the robustness of our results (for more details, see Appendix B). The final classification results in the actors being classified into three subgroups: two coalitions and a residual subgroup.

We used standard descriptive statistics to describe the coalitions' attributes in terms of PCBs as well as their relational characteristics. The same applies to the comparison of the decision-making actors with other actor groups (H2). Additionally, we have used Levene's test [86] for testing the difference of the policy dimension variance between the decision-makers and the other actor groups as defined below in Fig. 2 (H3). Levene's test is a parametric median-based approach used to test if *k* groups (sub-samples) have equal variance. Thus, the rejection of null hypothesis (assumption of equality of the variances) between the decision-makers and the other groups would support our expectations.

We also used deductive block-modeling based on Euclidean distances through the structural equivalence UCINET procedure [85]. A block model is a simplified representation of a network that consists of groups of nodes (blocks) that have similar relations to others and patterns of relations among nodes and blocks (social roles) [87,88]. Deductive block-modeling then compares observed structures to hypothesized models, allowing for the test of hypotheses about structural configurations of a network. The presence or absence of a tie between each pair of nodes is then regressed on a set of dummy variables representing blocks; the last block is used as the reference category [89]. The statistical significance assessment is based on the Quadratic Assignment Procedure [90], which uses 5000 trials of random matrix permutations and estimated standard errors based on resulting simulated sampling distribution. The model fit is given by a ratio of the variance in the pairwise presence or absence of ties explained by the differences among the blocks [89].

The ENGOs' and industry actors' targeting of decision-makers via political cooperation and expert information exchange (H4 and H5) was tested using two block models. Each model divided the corresponding matrix into four blocks based on actors' membership in (1) ENGOs, (2) industry, (3) decision-maker groups, or (4) none of the above. The industry group was included to control for its parallel activities. Thus, an above-average overall density of the 1–3 (ENGOs to decision-makers) block would support our expectations formulated in hypotheses H4a and H5a. Likewise, an above-average overall density of the 2–3 (industry to decision-makers) block would support our expectations formulated in hypotheses H4b and H5b (for more details, see Appendix C).

The coalition-based patterns of expert information exchange (H6) were tested using a block model that divided the expert information exchange matrix into three blocks based on actors' membership in the (1) *Industry Coalition*, (2) *Environmental Coalition*, or (3) a residual group. Thus, an above-average overall density of the within-coalition blocks 1–1 (*Industry Coalition*) and 2–2 (*Environmental Coalition*) would support our hypothesis (for more details, see Appendix C).

We used UCINET 6 [85] and R 3.3.1 [91] for data processing, analysis, and visualization. The data were collected through the SurveyMonkey platform [92].

4. Case description

The Czech Republic is a post-communist regime classified as a rather consensus model of democracy with a bicameral parliament, multiparty system, proportional representation, and prevailing practice of executive power-sharing in coalition governments [93,94]. The decision-making process on policy proposals is controlled primarily by the ruling political parties relying on support from the majority in the Chamber of Deputies and the competent Ministries (Ministry of Industry and Trade, Ministry of Agriculture, Ministry of Environment), which are primarily responsible for policy formulation and implementation. Interest group representation, although formally resembling a neocorporativist model, is not compromise-oriented and its functioning is closer to neopluralism. Thus, the associated policy venues are primarily used as vehicles for interest promotion and have only consultative competencies [95,96]. This creates a situation of majoritarian politics in a (semi)consensual institutional setting.

As a legacy of the command economy, Czech energy policy has been formed mostly by technicians recruited from industry and thus is designed for large centralized resources based on conventional fuels, especially coal and nuclear power. The position of conventional resources is further bolstered by a strong emphasis on energy self-sufficiency, which values coal as a safe domestic source [97]. In media discourse, coal has been framed predominantly economically and

technically through the performance of mining companies and the future of the industry. Environmental issues, much less represented, are mostly related to the direct mitigation of adverse local impacts [81]. This image of coal is further strengthened by substantial anti-environmentalist elite framing [98,99] and skeptical public perception of renewable energy [100].

The country is characterized by a coal-based economy [101] which has regularly ranked among the largest world net exporters of electricity with about 13 TWh generated by an equivalent of 16 million tons of burnt coal [102]. Although there are reserves of bituminous coal, brown coal, as well as lignite, only brown and bituminous coal continue to be mined. There is a planned phase-out in 2023 of bituminous coal production which is located in the Czech part of the Upper Silesian Basin. Brown coal opencast mining is located in the North Bohemian Basin (also frequently referred to as the Most Basin) and the Sokolov Basin [79,81]. There are 871 million tons of recoverable brown coal reserves owned by the state as well as private companies, thus creating a strong incentive to expand or at least maintain production [82,103]. Moreover, this position has been consistently supported by the Ministry of Industry and Trade, which has repeatedly proposed rescinding the *territorial ecological limits of surface coal mining* (henceforth "the limits") established by the first post-communist government in the brown coal regions of the Czech Republic. The limits were imposed primarily to diminish the ecological burden wrought by surface extraction of brown coal and the production of electricity in those regions as well as to reduce the impact on urbanized areas and other infrastructure [79,104]. They have been the focus of ongoing public and political debate since their establishment in 1991 [105]. The question of the limits soon became one of the major issues for the formation of the Czech environmental movement, which now has professionalized and started to rely on advocacy, lobbying, and expert knowledge for promoting its agenda [80,106,107]. Evidence-based tactics have also been used by proponents of rescinding the limits, including the Ministry of Industry and Trade, arguing it is necessary to secure heating supplies (cf. [108,109]). Thus, despite the fact that the *State Energy Policy* [110] envisages a long-term phase-out of coal, the process has been protracted and could be described as a contested transition.

5. Results

The Czech coal subsystem was clustered into two coalitions with opposing PCBs (H1). In this section, we present the composition and attributes of these coalitions, including their PCBs, as well as the results of the evaluation of the three investigated mechanisms.

5.1. Usual suspects: industry coalition and environmental coalition

We identified two coalitions, the *Industry Coalition* (IC) and *Environmental Coalition* (EC), based on the combination of the K-means cluster analysis used for exploring PCBs and the faction analysis applied to the *political cooperation* network. A 2-clusters solution was selected for the K-means cluster analysis of PCBs (see Appendix B) based on the highest silhouette width of 0.371 (within the range of 2–10 clusters). The 3-factions solution identified three cohesive subgroups (factions) with high proportion of correctness at 0.705 (see Appendix C). Although increases in the number of factions produced solutions with somewhat higher proportions of correctness, the first two factions in the 3-factions solution are to a large extent homogenous in terms of PCBs and show high face validity in contrast to solutions with more than 3 factions.

These results support the first hypothesis, which assumes the presence of *two* coalitions with distant PCBs. Their distance in terms of PCBs is examined in Section 5.3.

The *political cooperation* matrix blocked by coalition memberships (see Table 2) showed high within-group densities for both the *Environmental* (0.255) and *Industry* (0.279) coalitions, whereas within-group density for the *Residual Group* (0.055) was not statistically different from the overall network density (0.090). Although there are disproportionately more interactions within the coalitions, the low fit of the block model (0.067) shows that coalition membership is by far not the only driver of political cooperation. This is not that surprising since a number of other effects (be it network endogenous effects such as triadic closure or exogenous effects such as different forms of homophily or entrainment) are expected to be at play (cf. [51]). The within-group interactions in the *Residual Group* as well as the between-group interactions are not statistically different from the overall average (network density) except for blocks 1–3 (the *Industry Coalition* to *Residual Group*) and 3–2 (*Residual Group* to *Environmental Coalition*). The 1–3 block consists of ties from the *Industry Coalition* to mostly decision-making and administrative bodies (approx. 75% of the 1–3 ties). The 3–2 block exhibits significantly lower density of ties compared to the overall network density, indicating a lack of recognition of ENGOs' and research actors' relevance from the *Residual Group*.

Table 2
Block model – coalition membership.[a]

	1: IC	2: EC	3: RG
1: IC	**0.279**	0.065	**0.137**
2: EC	0.078	**0.255**	0.056
3: RG	0.062	**0.013**	0.055

[a] Adj. $R^2 = 0.067$, $p < 0.001$ (significant values in bold), obs. = 4556.

5.2. Composition of the coalitions

There are 17 members in the *Industry Coalition* and 18 actors in the *Environmental Coalition* (see Table 3). The properties of the coalitions in terms of their reputational power, core beliefs, PCBs, as well as structural characteristics and percentage of members included in the core of the *political cooperation* network are summarized in Table 4. The same indicators were used to describe the whole *political cooperation* network.

The *Industry Coalition* consisted of 17 actors and was dominated by the industry sector represented by six companies, a professional association, and a trade union. There are also three political parties at the state level (two ruling and one opposition party) and two political parties in the Ústí region (both ruling parties) as well as two central state agencies, one of them being the Ministry of Industry and Trade, a regional agency, and a regional council. The *Environmental Coalition* consisted of 18 actors, mostly ENGOs (8) and research organizations (6). The remaining members are two political parties from the state level (one of them is an opposition party, the other one is not represented in the Chamber of Deputies) and two state agencies, one of them being the Ministry of Agriculture.

Relationally, both coalitions have comparable densities that are about three times the overall average (0.090). The *IC* is highly centralized (0.533) around a state-owned company (coalition out-degree = 10), a ruling party (11), and a trade union (11), who are the most active actors, as well as the Ministry of Trade and Industry, who was the most popular actor (coalition in-degree = 12). The centralization of the *EC* is markedly lower (0.375). Nevertheless, the *EC* subgraph exhibited a core–periphery structure (core–periphery

Table 3
Coalition membership based on actor type.

Industry coalition ($n = 17$)	Environmental coalition ($n = 18$)
2 political parties (Ustí region)	8 ENGOs
3 political parties (central)	2 state agencies (central)
3 NGOs	2 political parties (central)
2 state agencies (central)	6 research organizations
1 regional agency (Ústí region)	
6 companies	

Table 4
Coalition attributes.[a,b]

	Reputational power	PCB economy	PCB environment	PCB policy	PCB process	Density	Degree centralization	% core
IC	0.478[a]	0.309[a]	0.413[a]	0.249[a]	0.315[a]	0.279	0.533	48
	(0.232)	(0.222)	(0.197)	(0.146)	(0.106)			
EC	0.183[b]	0.779[b]	0.914[b]	0.798[b]	0.757[b]	0.255	0.375	26
	(0.175)	(0.161)	(0.139)	(0.142)	(0.171)			
RG	0.211[b]	0.480[c]	0.574[c]	0.451[c]	0.497[c]	0.055	0.174	26
	(0.200)	(0.234)	(0.211)	(0.233)	(0.253)			
Total	0.271	0.516	0.624	0.492	0.520	0.090	0.353	100
	(0.233)	(0.273)	(0.266)	(0.278)	(0.258)			

[a] All variables range between 0 and 1. For details on PCB dimensions, see the *Data and Methods* section and Appendix B.
[b] One-way ANOVA tests for reputational power and PCBs economy dimension significant at $p < 0.05$. One-way ANOVA tests for remaining three PCBs dimensions significant at $p < 0.001$. Fisher's Least Significant Difference test was used to determine pairwise differences between the three groups for each dimension. The groups with a different superscript letter are significantly different at $p < 0.05$ with Bonferroni correction. For more details, see Appendix B.

fit = 0.733; see Appendix C). This might indicate different cooperation patterns within the coalitions. Whereas the *IC* seems to be centralized around the aforementioned actors and was clustered at the state and regional level, the *EC* was formed around a clique of 5 ENGOs (core members) that exchange resources and coordinate with the rest of the coalition. At the network level, there was only a moderate fit with the core–periphery structure (0.41; see Appendix C), corresponding with the expected presence of two relationally cohesive groups – coalitions. The core consisted of 23 organizations, eleven of which belong to the *IC* (48% of the core) and six to the *EC* (26%). In terms of reputational power, the *IC* had about a 2.5× higher score (0.478) than the *EC* (0.183). The differences were statistically significant and could indicate that although the *EC* was well-connected to the decision-making actors (more below) than the rest of the network in general, the impact of its interactions was limited. The core beliefs, expressing normative assumptions about how society and the economy ought to be organized, showed the expected ideological polarization. The core beliefs dimension was measured through a composite variable rescaled to range between 0 and 1, where the former indicates a laissez-faire position, the latter an interventionist position, and 0.5 a neutral position. The *IC* position (mean 0.384) was closer to an economically liberal view, whereas the *EC* position (0.653) was closer to a mixed-economy approach (for more information, see Appendix B).

5.3. Policy core beliefs

Comparison of the coalitions' PCBs, specifically their policy, economic, environmental, and process dimensions, supported the expectation about their opposing positions. Compared to the entire network, the lower standard deviations of the PCBs dimensions of the coalitions supported the assumption of their belief homogeneity (cf. [42]). The PCBs dimensions were composite variables rescaled to range between 0 and 1, where the former indicates a strong pro-coal position, the latter a strong anti-coal position, and 0.5 a neutral position (see Appendix B).

The coalitions were markedly distinct in all four dimensions. In the *economic dimension*, the *Industry Coalition* (mean 0.309) uniformly supports the overall economic benefits of coal mining and use. Nevertheless, the impacts of the decline in surface mining (henceforth "mining") on household heating supply and regional development are evaluated differently. The *IC* position is rather homogenous in the former but divided in the latter. The *Environmental Coalition* (mean 0.779) rejects the overall economic benefits of mining and its importance for regional development and marginally recognizes the negative impacts of mining decline on household heating supply. In the *environmental dimension*, the *IC* (mean 0.413) is divided on the environmental impacts of the mining and burning of coal and completely rejects its impacts on climate change. In contrast, the *EC* (mean 0.914) is nearly unanimous in its negative evaluation of coal's impacts on the environment as well as climate change. In the *policy dimension*, the *IC* (mean 0.249) unambiguously favors the importance of coal for the Czech Republic's energy independence, with only a minor dissent from the view that coal should be a key component of the future energy mix and that the mining limits should be lifted. The *EC* (mean 0.798) to some extent concedes that coal plays a role in energy independence but is strongly against the rescinding of mining limits and a future energy mix based on coal. In the *process dimension*, the *IC* (mean 0.331) is divided on the question of trust among key players in the coal industry. On the other hand, it largely agrees on the functionality of the mine life cycle and adequateness of the legal and regulatory framework. The *EC* (mean 0.782) sees the relationships among key players as distrustful, is divided on the issue of mine life cycle functionality, and sees the legal and regulatory framework as insufficient (Fig. 1).

These results support the first hypothesis, which assumes the presence of two coalitions with *distant PCBs*.

More specifically, the two coalitions significantly differ across all four dimensions. The largest distance between the coalitions is in the *policy dimension*, which captures the future role of coal including the politically sensitive question of mining limits. Likewise, they markedly disagree on the *environmental dimension*, which accounts for environmental degradation including climate change impacts, as well as the *economy dimension*, which evaluates the economic benefits of coal mining. In the *process dimension*, both coalitions exhibit the largest variance, thus indicating weaker within-coalition consensus.

5.4. Decision-making actors: far from consensus

The first investigated mechanism, *fragmentation of political authority*, focuses on (H2) cross-coalition membership of the decision-making actors and (H3) comparatively higher variability of their PCBs. As for the former, three key decision-making actors (Ministry of Agriculture, Ministry of Environment, and Ministry of Industry and Trade) have been classified in different groups. The Ministry of Agriculture is a member of the *EC*, the Ministry of Industry and Trade is a member of the *IC*, and the Ministry of Environment is part of the *Residual Group* (see Appendix B). Each of the ministries is controlled by a different ruling party, their PCBs are markedly different, and they are influenced by opposing coalitions.

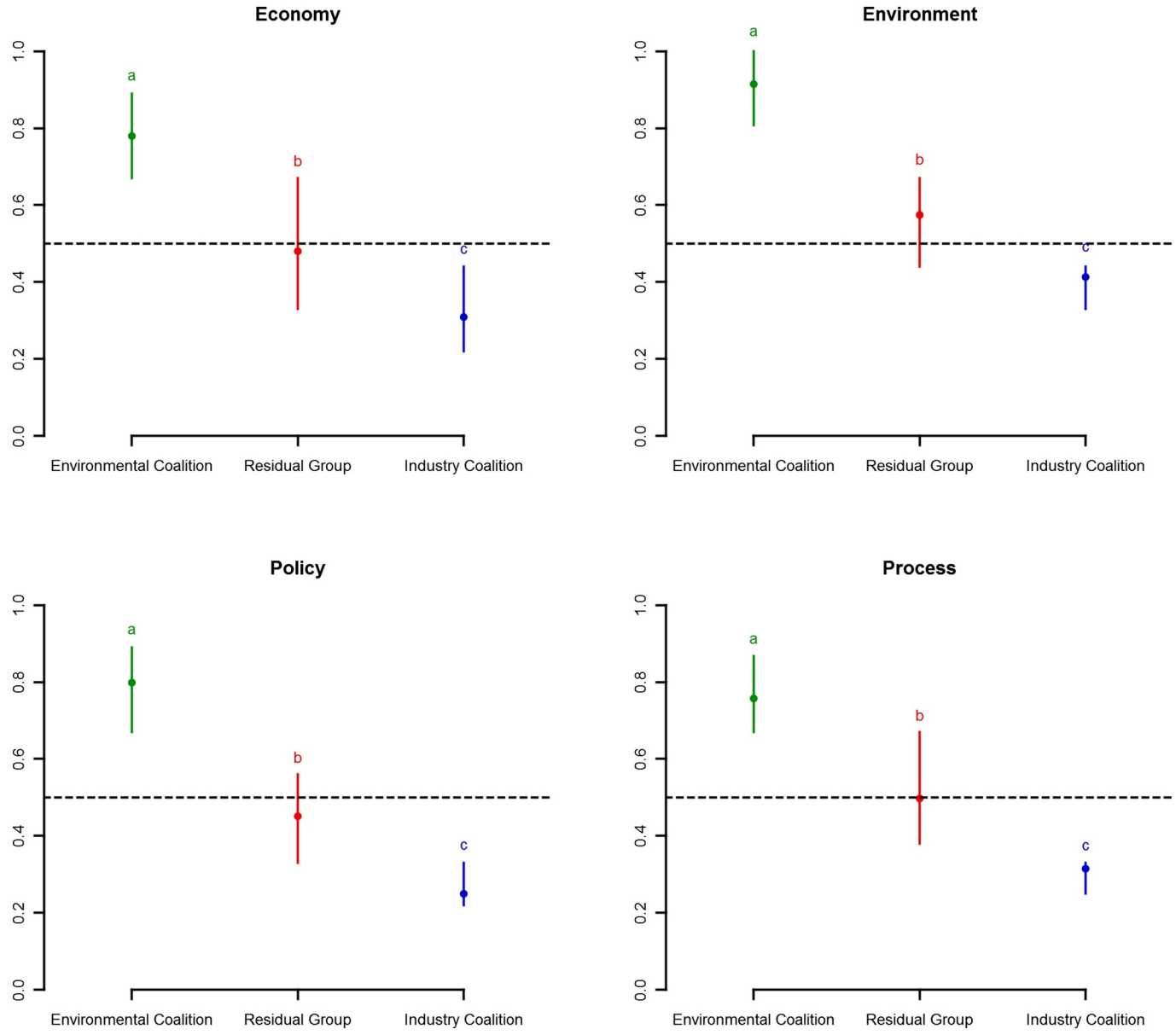

Fig. 1. PCB comparison based on coalition membership.[1,2]

[1]All variables range between 0 (strong pro-coal position) and 1 (strong anti-coal position). For details on PCB dimensions, see the *Data and Methods* section and Appendix B.

[2]Multiple comparisons test was used to determine pairwise differences between the three groups for each dimension. The groups marked with a different superscript letter and different color are significantly different at $p < 0.05$. For more information, see Appendix B.

Thus, these results support the second hypothesis on fragmentation of decision-makers based on their cross-coalition memberships.

We also applied a median-based Levene's test [86] to evaluate whether the sub-samples (i.e., the decision-makers and the other six remaining groups) have equal variances in the *policy dimension* of PCBs which captures views on the future of coal in the Czech Republic and seems to constitute a cleavage within the subsystem. The results show that the decision-makers' variance was larger and statistically different ($p < 0.05$) only when compared to the ENGOs but not to the other actor groups (see Appendix B).

These results do not support the third hypothesis on higher variability of decision-makers' PCBs in comparison to the other actor groups. The descriptive measures (see also Fig. 2), nevertheless, indicate a large spread of their PCBs with a range from 0.11 to 0.89 and a standard deviation (0.23) for the *policy dimension*.

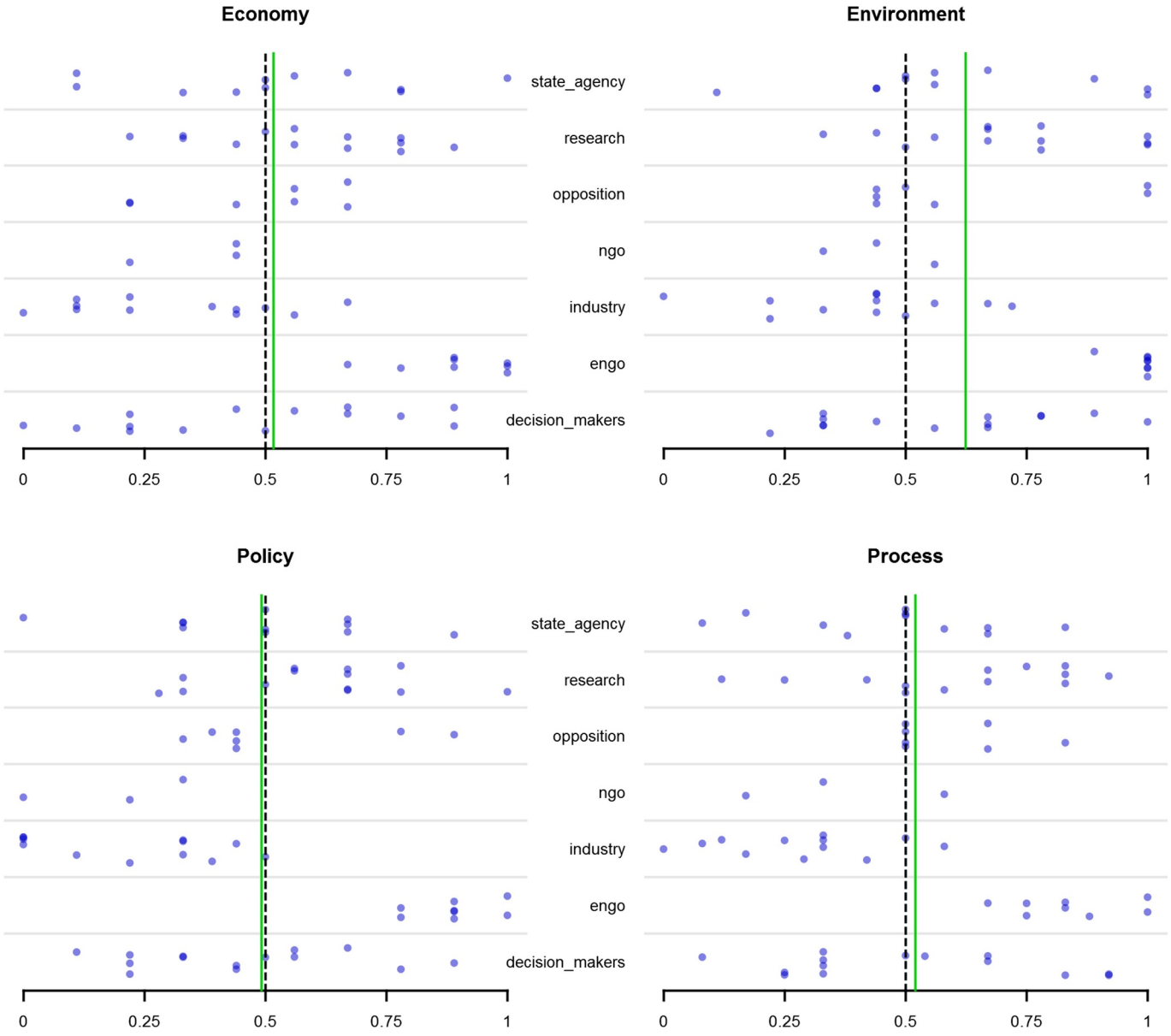

Fig. 2. PCB scores based on actor type.[1,2]

[1]All variables range between 0 (strong pro-coal position) and 1 (strong anti-coal position). For details on PCB dimensions, see the *Data and Methods* section and Appendix B.

[2]The blue dots represent the scores of individual organizations. The dotted line represents a neutral position (0.5); the green line represents the mean value.

5.5. Targeting decision-makers: a shared practice

The second investigated mechanism, *access to political authority*, focuses on ENGOs' and industry actors targeting of decision-makers via *political cooperation* (H4a and H4b) and *expert information exchange* (H5a and H5b) ties. Thus, the resulting block model captures patterns of interactions among the aforementioned groups and the rest of the network (the *remainder*). The block model of the *political cooperation* network (Table 5) shows that both ENGOs and the industry extend disproportionately more ties to the decision-making actors, thus presenting an indication of the assumed targeting. More specifically, the densities of the 1–3 (ENGOs to decision-makers) and 2–3 (industry to decision-makers) blocks are 0.333 and 0.181 in comparison to the overall network density of 0.090. There are also disproportionately more ties from decision-makers to the industry (3–2 block with density 0.167), which also supports the findings on privileged access of the *Industry Coalition*. Additionally, there was evidence of targeting also in the case of the *remainder* (4–3 block with density 0.143), which includes

Table 5
Block model – political cooperation.[a]

	1: ENGOs	2: industry	3: decision-makers	4: remainder
1: ENGOs	**0.786**	0.063	**0.333**	0.048
2: industry	0.042	0.136	**0.181**	0.107
3: decision-makers	0.104	**0.167**	**0.267**	0.099
4: remainder	0.054	0.069	**0.143**	0.057

[a] Adj. $R^2 = 0.095$, $p < 0.001$ (significant values in bold), obs. = 4556.

Table 6
Block model – expert information exchange.[a]

	1: ENGOs	2: industry	3: decision-makers	4: remainder
1: ENGOs	**0.982**	0.167	**0.563**	0.140
2: industry	0.073	**0.348**	**0.278**	**0.206**
3: decision-makers	0.208	0.208	**0.633**	0.139
4: remainder	0.122	0.161	**0.226**	0.120

[a] Adj. $R^2 = 0.095$, $p < 0.001$ (significant values in bold), obs. = 4556.

research actors. Interestingly, the density of the 2–2 industry block (0.136) is not statistically different from the overall network density. This may indicate the co-existence of cooperative and competitive relationships among the industry actors. The block model of the *expert information exchange* network (Table 6) provided a similar picture. The densities of the 1–3 (ENGOs to decision-makers) and 2–3 (industry to decision-makers) blocks were 0.563 and 0.278, respectively, in comparison to the overall network density of 0.173. There were also two notable differences from political cooperation. Firstly, the 3–2 block (decision-makers to industry) does not differ from the overall network density. Secondly, there are disproportionately more ties from the industry to the *remainder* (2–4), which also includes administrative bodies. The lower fit of the block models (adj. $R^2 = 0.098$ for each) is not surprising given the actor heterogeneity of the coalitions. Although targeting was only one of the drivers of interactions, it clearly contributes to its structuring.

These results partially support the fourth (H4a, H4b) and fifth (H5b, H5b) hypotheses, which assume targeting of decision-makers by ENGOs and industry actors. The *partial* support of the hypotheses is due to the comparable pattern of ties from the *residual* group (which includes non-principal coalition members such as research organizations) to the decision-makers.

5.6. Coalition-based patterns of expert information exchange

The third investigated mechanism, *use of expert information*, focuses on (H6) prevalent patterns of expert information ties within the subsystem's coalition structure. The block model (Table 7) of the *expert information exchange* network shows that within-coalition densities of the *Industry Coalition* (1–1: 0.478) and *Environmental Coalition* (2–2: 0.441) are almost three times higher than the network density (0.173). The only other statistically different interaction is the 1–3 block, which consists of ties from the *Industry Coalition* (1) to mostly decision-making and administrative bodies in the *Residual Group*. The cross-coalition densities (1–2 and 2–1), on the other hand, do not statistically differ from the network density. As in the previous case, the lower fit (adj. $R^2 = 0.094$) of the block model indicates that coalition membership is only one of the drivers of *expert information exchange*.

Table 7
Block model – expert information exchange.[a]

	1: IC	2: EC	3: RG
1: IC	**0.478**	0.121	**0.209**
2: EC	0.183	**0.441**	0.116
3: RG	0.153	0.066	0.112

[a] Adj. $R^2 = 0.094$, $p < 0.05$ (significant values in bold), obs. = 4556.

These results support the sixth hypothesis, which assumes a higher density of expert information exchange within the coalitions than across them.

6. Discussion

Sociotechnical transitions are inherently political as they involve diverse actors that compete over their pace and direction [7,111]. Resulting *external perturbations* (such as rapid growth of new technologies) then impact more specific and semi-autonomous sectors (such as the energy industry) in terms of opening opportunities for major policy change. In this context, we focused on the conditions for policy change in an adversarial subsystem, specifically, the case of the coal subsystem in the Czech Republic. We examined the subsystem's coalition structure and investigated particular mechanisms through which the present coalitions and policy actors interact and thereby influence the subsystem dynamics. In line with the theoretical expectations on mature [19,31] and adversarial subsystems [25,59], we identified two opposing coalitions. The *Industry Coalition* led by industry incumbents is the dominant coalition with superior resources including direct access to decision-making through two central and two regional ruling political parties and the Ministry of Industry and Trade. It considers coal to be as an integral part of the future energy mix and supports rescinding the mining limits. The *Environmental Coalition* led by ENGOs, on the other hand, challenges the status quo and promotes a rapid departure from coal. It tries to offset its inferior position by focusing on the key issue of mining limits and by using its transactional capacity [63].

As expected in adversarial subsystems [25,59], the two coalitions differ markedly in their PCBs. In addition to the pro-status quo orientation of the dominant coalition, this circumstance limits opportunities for policy change through negotiated agreement [14]. In this high-conflict environment, the situation is expected to be further affected by the so-called *devil shift*—a systematic bias to overestimate the capacities and bad intentions of political opponents which further deepens distrust between competing advocacy coalitions [112] and thus hinders policy learning opportunities [113]. As a result, any internally driven major policy change is blocked by a competing coalition. However, this situation does not generate a “hurting stalemate” [112] but rather a series of partial incoherent policy modifications that both introduce transition-oriented measures as well as reinforce the vested interests of the industry.

In this context, the *Environmental Coalition* utilizes opportunity structures provided by external perturbations, such as increasing Europeanization of energy and environmental policies [114,115], to further legitimize and boost its demands to the government. The dominant *Industry Coalition*, on the other hand, has been relatively successful in resisting these pressures and maintaining the status quo. This is well-documented by recent notable events such as the rescission of limits on the Bílina mine site of the majority state-owned company North Bohemia Coal Mines in 2015 [109]. While the Ministry of Trade and Industry tried to push the rescission of limits further in the proposed *Raw Material Policy*, this effort has been rejected by the government [116]. Likewise, although the updated *State Energy Policy*, a key strategic document, proposes penalization of low-efficiency coal-fueled power generation, the government has not approved an amendment that would set related obligatory compensation payments [110,117]. Importantly, the key decision on the limits for the Czechoslovak Army Mine has been postponed to 2020, thus keeping alive the opportunity to substantially prolong coal mining and utilization [118]. Nevertheless, it would be a simplification to describe the subsystem only in terms of the two competing coalitions.

That said, we reflect on the early critique of the Advocacy Coalition Framework's overreliance on belief systems at the expense of its relational element [119,120] as well as strategically oriented motives of actors' interactions [121]. In other words, the assumption of shared *policy core beliefs* and *coordinated activity* implies a restrictive definition of coalitions. To obtain a more nuanced picture, it is useful to focus on the relational element (factions) in order to investigate with whom actors cooperate, regardless of their PCBs. Overall, the results are not notably different from the coalition detection (see Appendix B), which supports the initial expectation of two competing and ideologically distant coalitions. However, there are also deviant cases that differ from the average PCBs scores of the factions. These actors are tightly linked with other members of the given faction but do not share their PCBs (see Appendix B). As such, they may be regarded as potential brokers that could facilitate dialogue with actors outside the faction and thereby encourage policy learning. The Government's Office occupies such a position within the *Industry Coalition*-led faction. Following this argument, its position should be further strengthened and utilized. A related methodological implication is that it might be problematic to use only subgroup cohesion measures, such as faction analysis, to identify coalitions (cf. [42,48]).

To provide a more comprehensive view on how the adversarial subsystem functions, we have further complemented the coalition analysis with a focus on three particular mechanisms: (1) fragmentation of decision-makers, (2) targeting of decision-makers, and (3) use of expert information.

First, the *decision-makers are fragmented* in terms of their prevailing interactions as well as PCBs. The resulting cross-coalition memberships of decision makers are expected to limit policy learning opportunities in a high-conflict environment (cf. [19,33]) and generally impede long-term planning as well as management. This is important especially given the mixed membership of the three competent ministries. Moreover, a large spread in PCBs is present also among state agencies responsible for supervising and evaluating policies. In general, such political authority fragmentation is considered to constitute an important barrier to the transformation of policy learning into specific policy changes [26,122]. As Poloni-Staudinger [123] shows, the institutions and mechanisms of consensual democracy tend to improve the environmental effectiveness of governments [94]. Their strengthening through inclusively designed policy venues supporting cross-coalition interactions and stakeholder engagement could therefore incentivize policy learning (cf. [51]). The creation of institutions that would coordinate and/or supervise transition-related activities of the relevant state agencies seems to be a reasonable option.

Second, the *targeting of decision-makers* through *political cooperation* and *expert information* is done by both ENGOs and industry as well as by research organizations. The ENGOs' activities are in line with *transactional activism* [63], which aims to form partnerships with key government actors [124]. Nevertheless, there is clear evidence that industry actors, dominated by incumbents, rely on the same tactic [68]. Importantly, decision-makers extend disproportionately more political cooperation ties exclusively to industry, which is expected to strengthen regime-resistance [68]. The use of the targeting tactics to induce a gradual policy change is thus contested by opposing actor groups that include most of the principal members of competing coalitions [25]. Altogether, we expect that the targeting practiced by ideologically distant actors that belong to different coalitions over time deepens fragmentation among decision-makers and increases the level of conflict within the subsystem.

Third, *expert information* exchange strongly overlaps with coalition membership. This finding suggests that the use of expert information increases cohesiveness within coalitions and shows a limited potential for policy learning across coalitions. In contrast to the technocratic view [125], this indicates a political nature underlying expert information [25] amplified by conditions of high conflict and lack of established expert forums [19,22]. As in the previous case, the involvement of policy brokers and entrepreneurs is expected to enhance opportunities for cross-coalition policy learning [126,127]. In this context, a pragmatic approach to expert information [128] that requires critical interaction between experts, decision-makers, and the public should be promoted [129].

The study has important limitations that should be addressed in future research. First, it is a *single cross-sectional* case study, which implies limited generalizability of the results. The study primarily provides *novel empirical evidence* (see [130]) to research on adversarial policy subsystems [25,59] and, more broadly, policy dimension of energy transition [7,10] that should be further integrated in comparative studies (cf. [40,131]). Second, it uses mainly exploratory methods with limited potential to account for confounding variables and other potential sources of bias. Considering the above, there appear to be several productive avenues for future research. Application of tie-formation models could be used to identify drivers of cooperation that allow for multi-theoretical and mechanism-based explanations [132], while a longitudinal study would be a logical step enabling the examination of such processes over an extended period of time [28,133]. A position analysis could help to identify actors potentially critical for overcoming polarization of the policy subsystem and fragmentation of political authority [28,134], optimally executed as mixed-methods research in order to uncover how key actors themselves understand their position [135]. Likewise, taking into account the importance of landscape pressures, research on external perturbations [16,18] as well as policy transfer seems to be especially promising [136].

7. Conclusions

This study examined advocacy coalitions and interactions among policy actors within an adversarial subsystem. More specifically, we focused on the Czech coal subsystem, which faces increasing transition-induced pressures. We identified two ideologically distant coalitions that compete over access to fragmented political authority and whose expert information exchange tends to reproduce within-coalition coordination patterns. Thus, we argue that the Czech coal phase-out will not unfold through incremental adjustments [137] that result from policy learning or negotiated agreements. Instead, it will continue to be driven by external perturbations which, nevertheless, do not disrupt established institutional and policy arrangements due to the adversarial nature of the subsystem. As a result, we expect the overlay of new arrangements on top of those already existing without transforming the subsystem's core logic [138]. This process is further facilitated by the substantial relational as well as ideological fragmentation of the decision-making actors and political authority in general. As argued by Geels et al. [139], such developments could nevertheless also indicate a potential for more substantive policy changes if actors encounter new problems and see new opportunities. The results of the IPPC's Special Report [140] will likely bring such incentives for policy change, including to reopen the discussion on the so-called *Anti-fossil Act* which would authoritatively outline a transition pathway where a new round of struggle between the *Industry* and *Environmental* coalitions could be expected.

This study adds to the Advocacy Coalition Framework research by analyzing the internal functioning of an adversary subsystem and highlighting limitations of coalition detection techniques. It also makes a theoretical contribution by complementing the Advocacy Coalition Framework with mechanism-based explanations derived from related literatures, particularly that on socio-technical transitions. Such approach locates the study of policy change within the complex context of socio-technical systems, thus substantially exceeding the issue-specific focus of policy subsystems and addressing the assumption of their interdependency (cf. [19]). The Advocacy Coalition Framework, on the other hand, provides a conceptual and methodological toolkit well-suited for in-depth analysis of policy processes, a crucial part of the socio-technical systems' institutional structure (cf. [7]). Integrating the

two frameworks thus offers significant potential to enhance research on energy transition by explicitly linking its macro-level (e.g., decline of specific industries) and meso-level (e.g., related policy changes) processes.

Acknowledgments

The authors would like to thank Nadja Kunz, Manuel Fischer, Juraj Medzihorský, Filip Černoch, Tomáš Diviák, John Owen, Tomáš Vlček, Jan Daniel, participants of the Research Seminar at the Masaryk University, participants of the SMI Research Seminar at the University of Queensland, and to anonymous reviewers for valuable comments as well as to Colin Kimbrell who provided language editing services. Importantly, the authors also thank to all the respondents for kindly participating in the study. This research was supported by the Czech Science Foundation (Grant 17–22978Y).

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.erss.2019.101283.

References

[1] V. Smil, Energy and Civilization: A History, The MIT Press, 2017.
[2] IEA, CO_2 Emissions from Fuel Combustion 2018: Overview, (2018). https://webstore.iea.org/co2-emissions-from-fuel-combustion-2018-overview (Accessed 15 December 2018).
[3] Europe's Energy Transition is Well Underway, European Commission, 2017. https://ec.europa.eu/energy/en/news/europes-energy-transition-well-underway (Accessed 15 December 2018).
[4] International Energy Agency, World Energy Outlook iea.org/weo, (2018), https://doi.org/10.1787/weo-2017-en.
[5] S.H. Ali, D. Giurco, N. Arndt, E. Nickless, G. Brown, A. Demetriades, R. Durrheim, M.A. Enriquez, J. Kinnaird, A. Littleboy, L.D. Meinert, R. Oberhänsli, J. Salem, R. Schodde, G. Schneider, O. Vidal, N. Yakovleva, Mineral supply for sustainable development requires resource governance, Nature 543 (2017) 367–372, https://doi.org/10.1038/nature21359.
[6] F.W. Geels, J. Schot, Typology of sociotechnical transition pathways, Res. Policy 36 (2007) 399–417, https://doi.org/10.1016/J.RESPOL.2007.01.003.
[7] J. Markard, M. Suter, K. Ingold, Socio-technical transitions and policy change – advocacy coalitions in Swiss energy policy, Environ. Innov. Soc. Transitions 18 (2016) 215–237, https://doi.org/10.1016/J.EIST.2015.05.003.
[8] T. Hoppe, F. Coenen, M. van den Berg, Illustrating the use of concepts from the discipline of policy studies in energy research: an explorative literature review, Energy Res. Soc. Sci. 21 (2016) 12–32, https://doi.org/10.1016/J.ERSS.2016.06.006.
[9] E. Laes, L. Gorissen, F. Nevens, A comparison of energy transition governance in Germany, The Netherlands and the United Kingdom, Sustainability 6 (2014) 1129–1152, https://doi.org/10.3390/su6031129.
[10] J. Markard, The next phase of the energy transition and its implications for research and policy, Nat. Energy 3 (2018) 628–633, https://doi.org/10.1038/s41560-018-0171-7.
[11] J. Meadowcroft, What about the politics? Sustainable development, transition management, and long term energy transitions, Policy Sci. (2009), https://doi.org/10.1007/s11077-009-9097-z.
[12] P.A. Sabatier, An advocacy coalition framework of policy change and the role of policy-oriented learning therein, Source Policy Sci. 21 (1988) 129–168 https://www.jstor.org/stable/pdf/4532139.pdf?refreqid=excelsior%3Ae17c0dc9672b2d132e181c22b4c4616c (accessed April 3, 2019).
[13] P.A. Sabatier, C.M. Weible, The advocacy coalition framework: innovations and clarifications, in: P.A. Sabatier (Ed.), Theor. Policy Process, Westpress, 2007, pp. 189–220.
[14] P.A. Sabatier, C.M. Weible, Theories of the Policy Process, (2014).
[15] P.A. Sabatier, Knowledge, policy-oriented learning, and policy change, Knowledge 8 (1987) 649–692, https://doi.org/10.1177/016402598700800400 5.
[16] D. Nohrstedt, External shocks and policy change: Three Mile Island and Swedish nuclear energy policy, J. Eur. Public Policy 12 (2005) 1041–1059, https://doi.org/10.1080/13501760500270729.
[17] D. Nohrstedt, The politics of crisis policymaking: Chernobyl and Swedish nuclear energy policy, Policy Stud. J. 36 (2008) 257–278, https://doi.org/10.1111/j.1541-0072.2008.00265.x.
[18] A. Rinscheid, B. Eberlein, P. Emmenegger, V. Schneider, Why do junctures become critical? Political discourse, agency, and joint belief shifts in comparative perspective, Regul. Gov. (2019), https://doi.org/10.1111/rego.12238.
[19] P.A. Sabatier, The advocacy coalition framework: revisions and relevance for Europe, J. Eur. Public Policy 5 (1998) 98–130, https://doi.org/10.1080/13501768880000051.
[20] J.J. Pierce, H.L. Peterson, K.C. Hicks, Policy change: an advocacy coalition framework perspective, Policy Stud. J. (2017), https://doi.org/10.1111/psj.12223.
[21] E.A. Albright, Policy change and learning in response to extreme flood events in Hungary: an advocacy coalition approach, Policy Stud. J. 39 (2011) 485–511, https://doi.org/10.1111/j.1541-0072.2011.00418.x.
[22] C.M. Weible, Expert-based information and policy subsystems: a review and synthesis, Policy Stud. J. 36 (2008) 615–635, https://doi.org/10.1111/j.1541-0072.2008.00287.x.
[23] H. Kriesi, S. Adam, M. Jochum, Comparative analysis of policy networks in Western Europe, J. Eur. Public Policy (2006), https://doi.org/10.1080/13501760500528803 1763.
[24] C.M. Weible, Beliefs and perceived influence in a natural resource conflict: an advocacy coalition approach to policy networks, Polit. Res. Q. 58 (2005) 461–475, https://doi.org/10.1177/106591290505800308.
[25] C.M. Weible, A. Pattison, P.A. Sabatier, Harnessing expert-based information for learning and the sustainable management of complex socio-ecological systems, Environ. Sci. Policy 13 (2010) 522–534, https://doi.org/10.1016/j.envsci.2010.05.005.
[26] M. Fischer, Coalition structures and policy change in a consensus democracy, Policy Stud. J. 42 (2014) 344–366, https://doi.org/10.1111/psj.12064.
[27] M.A. Zafonte, P.A. Sabatier, Shared beliefs and imposed interdependencies as determinants of ally networks in overlapping subsystems, J. Theor. Polit. 10 (1998) 473–505, https://doi.org/10.1177/0951629898010004005.
[28] P.A. Sabatier, H.C. Jenkins-Smith, Policy Change and Learning : An Advocacy Coalition Approach, Westview Press, 1993.
[29] T. Vlček, F. Černoch, Energy Sector and Energy Policy of the Czech Republic, Masarykova Univerzita, 2013, https://doi.org/10.5817/CZ.MUNI.M210-6523-2013.
[30] S. Wasserman, K. Faust, Social Network Analysis : Methods and Applications, Cambridge University Press, 1994. https://books.google.cz/books/about/Social_Network_Analysis.html?id=CAm2DpIqRUIC&redir_esc=y (Accessed 7 January 2019).
[31] K. Ingold, Network structures within policy processes: coalitions, power, and brokerage in Swiss climate policy, Policy Stud. J. 39 (2011) 435–459, https://doi.org/10.1111/j.1541-0072.2011.00416.x.
[32] C.M. Weible, T. Heikkila, K. Ingold, M. Fischer, Policy Debates on Hydraulic Fracturing Comparing Coalition Politics in North America and Europe, Palgrave Macmillan US, New York, 2016, https://doi.org/10.1057/978-1-137-59574-4.
[33] C.M. Weible, P.A. Sabatier, K. McQueen, Themes and variations: taking stock of the advocacy coalition framework, Policy Stud. J. 37 (2009) 121–140, https://doi.org/10.1111/j.1541-0072.2008.00299.x.
[34] P. Leifeld, V. Schneider, Information exchange in policy networks, Am. J. Pol. Sci. 56 (2012) 731–744, https://doi.org/10.1111/j.1540-5907.2011.00580.x.
[35] P. Cairney, M. Fischer, K. Ingold, Hydraulic fracturing policy in the UK: coalition, cooperation and opposition in the face of uncertainty, Polit. Stud. Assoc. Annu. Int. Conf. 2015, pp. 1–31, , https://doi.org/10.1057/978-1-137-59574-4_4.
[36] C.M. Weible, P.A. Sabatier, Comparing policy networks: marine protected areas in California, Policy Stud. J. 33 (2005) 181–201, https://doi.org/10.1111/j.1541-0072.2005.00101.x.
[37] D. Knoke, Who steals my purse steals trash, J. Theor. Polit. 10 (1998) 507–530, https://doi.org/10.1177/0951692898010004006.
[38] M. Fischer, P. Sciarini, Drivers of collaboration in political decision making: a cross-sector perspective, J. Polit. 78 (2016) 63–74, https://doi.org/10.1086/683061.
[39] J. Broadbent, Comparative climate change policy networks, in: J.N. Victor, A.H. Montgomery, M. Lubell (Eds.), Oxford Handb. Polit. Networks, Oxford University Press, 2016, , https://doi.org/10.1093/oxfordhb/9780190228217.013.38.
[40] T. Ylä-Anttila, A. Gronow, M.C.J. Stoddart, J. Broadbent, V. Schneider, D.B. Tindall, Climate change policy networks: why and how to compare them across countries, Energy Res. Soc. Sci. 45 (2018) 258–265, https://doi.org/10.1016/J.ERSS.2018.06.020.
[41] P. Cairney, The role of evidence in theories of the policy process, Polit. Evidence-Based Policy Mak. Palgrave Macmillan UK, London, 2016, pp. 13–50, https://doi.org/10.1057/978-1-137-51781-4_2.
[42] A. Gronow, T. Ylä-Anttila, Cooptation of ENGOs or treadmill of production? Advocacy coalitions and climate change policy in Finland, Policy Stud. J. 00 (2016) 1–22, https://doi.org/10.1111/psj.12185.
[43] M. Brockhaus, M. Di Gregorio, National REDD + policy networks: from cooperation to conflict, Ecol. Soc. 19 (2014), https://doi.org/10.5751/ES-06921-190414.
[44] D.J. Elgin, C.M. Weible, A stakeholder analysis of colorado climate and energy issues using policy analytical capacity and the advocacy coalition framework, Rev. Policy Res. 30 (2013) 114–133, https://doi.org/10.1111/ropr.12005.
[45] D.J. Hess, Coalitions, framing, and the politics of energy transitions: local democracy and community choice in California, Energy Res. Soc. Sci. 50 (2019) 38–50, https://doi.org/10.1016/J.ERSS.2018.11.013.
[46] M. Hudson, What does Canute want? The "Monash Forum" and the Australian climate deadlock, Energy Res. Soc. Sci. 49 (2019) 126–133, https://doi.org/10.1016/J.ERSS.2018.10.029.
[47] H. Kriesi, M. Jegen, The Swiss energy policy elite: the actor constellation of a policy domain in transition, Eur. J. Polit. Res. 39 (2001) 251–287, https://doi.org/10.1111/1475-6765.00577.
[48] P.M. Wagner, T. Ylä-Anttila, Who got their way? Advocacy coalitions and the Irish climate change law, Environ. Polit. 27 (2018) 872–891, https://doi.org/10.1080/09644016.2018.1458406.
[49] S.J. Yun, D. Ku, J.Y. Han, Climate policy networks in South Korea: alliances and

conflicts, Clim. Policy 14 (2014) 283–301, https://doi.org/10.1080/14693062.2013.831240.
[50] D. Nohrstedt, Do advocacy coalitions matter? Crisis and change in Swedish nuclear energy policy, J. Public Admin. Res. Theory 20 (2010) 309–333, https://doi.org/10.1093/jopart/mun038.
[51] K. Ingold, M. Fischer, P. Cairney, Drivers for policy agreement in nascent subsystems: an application of the advocacy coalition framework to Fracking policy in Switzerland and the UK, Policy Stud. J. 45 (2017) 442–463, https://doi.org/10.1111/psj.12173.
[52] P.M. Wagner, T. Ylä-anttila, Can policy forums overcome echo chamber effects by enabling policy learning? Evidence from the Irish climate change policy network, J. Public Policy (2018).
[53] P. Cairney, M. Fischer, K. Ingold, Fracking in the UK and Switzerland: why differences in policymaking systems don't always produce different outputs and outcomes, Policy Polit. (2016) 1–22, https://doi.org/10.1332/030557316X14793989976783.
[54] J. Osička, L. Lehotský, V. Zapletalová, F. Černoch, B. Dančák, Natural gas market integration in the Visegrad 4 region: an example to follow or to avoid? Energy Policy 112 (2018) 184–197, https://doi.org/10.1016/J.ENPOL.2017.10.018.
[55] B. Rennkamp, S. Haunss, K. Wongsa, A. Ortega, E. Casamadrid, Competing coalitions: the politics of renewable energy and fossil fuels in Mexico, South Africa and Thailand, Energy Res. Soc. Sci. 34 (2017) 214–223, https://doi.org/10.1016/J.ERSS.2017.07.012.
[56] M.C.J. Stoddart, D.B. Tindall, J. Smith, R. Haluza-Delay, Media access and political efficacy in the eco-politics of climate change: Canadian national news and mediated policy networks, Environ. Commun. 11 (2017) 386–400, https://doi.org/10.1080/17524032.2016.1275731.
[57] E. Schmid, B. Knopf, A. Pechan, Putting an energy system transformation into practice: the case of the German Energiewende, Energy Res. Soc. Sci. 11 (2016) 263–275, https://doi.org/10.1016/J.ERSS.2015.11.002.
[58] M. Sotirov, M. Memmler, The advocacy coalition framework in natural resource policy studies — recent experiences and further prospects, For. Policy Econ. 16 (2012) 51–64, https://doi.org/10.1016/j.forpol.2011.06.007.
[59] C.M. Weible, T. Heikkila, J.J. Pierce, Understanding rationales for collaboration in high-intensity policy conflicts, J. Public Policy 38 (2018) 1–25, https://doi.org/10.1017/S0143814X16000301.
[60] M. Fischer, Looking beneath the surface: differences in decision-making structures across processes, Polit. Decis. Switz. Palgrave Macmillan UK, London, 2015, pp. 78–97, https://doi.org/10.1057/9781137508607_4.
[61] T.J. Lowi, Four systems of policy, politics, and choice, Public Admin. Rev. 32 (1972) 298–310. https://www.jstor.org/stable/pdf/974990.pdf?refreqid=excelsior%3A83d4d0c28d9eee46a9b0aa6e0dc84e58 (Accessed 15 December 2018).
[62] J.J. Pierce, H.L. Peterson, M.D. Jones, S.P. Garrard, T. Vu, There and back again: a tale of the advocacy coalition framework, Policy Stud. J. 45 (2017) S13–S46, https://doi.org/10.1111/psj.12197.
[63] T. Petrova, S. Tarrow, Transactional and participatory activism in the emerging European polity, Comp. Polit. Stud. 40 (2007) 74–94, https://doi.org/10.1177/0010414006291189.
[64] K. Čada, K. Ptáčková, Possibilities and limits of collaboration between science and NGOs in the Czech Republic, J. Clean. Prod. 49 (2013) 25–34, https://doi.org/10.1016/J.JCLEPRO.2012.07.039.
[65] O. Císař, J. Navrátil, K. Vráblíková, Staří, noví, radikální: politický aktivismus v České republice očima teorie sociálních hnutí, Czech Sociol. Rev. 47 (2011). https://www.soc.cas.cz/publikace/stari-novi-radikalni-politicky-aktivismus-v-ceske-republice-ocima-teorie-socialnich-hnuti (Accessed 15 December 2018).
[66] O. Císař, J. Navrátil, Promoting competition or cooperation? The impact of EU funding on Czech advocacy organizations, Democratization 22 (2015) 536–559, https://doi.org/10.1080/13510347.2013.869742.
[67] J. Mazák, T. Diviák, Transactional activism without transactions: network perspective on anti-corruption activism in the Czech Republic, Soc. Mov. Stud. 17 (2018) 203–218, https://doi.org/10.1080/14742837.2017.1404904.
[68] F.W. Geels, Regime resistance against low-carbon transitions: introducing politics and power into the multi-level perspective, Theory Cult. Soc. (2014), https://doi.org/10.1177/0263276414531627.
[69] U. Beck, Risk Society: Towards a New Modernity, Sage Publications, 1992. https://www.amazon.com/Risk-Society-Modernity-Published-association/dp/0803983468 (Accessed 15 December 2018).
[70] C. Boswell, Knowledge, legitimation and the politics of risk: the functions of research in public debates on migration, Polit. Stud. 57 (2009) 165–186, https://doi.org/10.1111/j.1467-9248.2008.00729.x.
[71] F. Fischer, Technocracy and the Politics of Expertise, Sage Publications, 1990.
[72] P. Ocelík, J. Osička, V. Zapletalová, F. Černoch, B. Dančák, Local opposition and acceptance of a deep geological repository of radioactive waste in the Czech Republic: a frame analysis, Energy Policy 105 (2017), https://doi.org/10.1016/j.enpol.2017.03.025.
[73] P. Leifeld, Reconceptualizing major policy change in the advocacy coalition framework: a discourse network analysis of German pension politics, Policy Stud. J. 41 (2013) 169–198, https://doi.org/10.1111/psj.12007.
[74] A. Lis, P. Stankiewicz, Framing shale gas for policy-making in Poland, J. Environ. Policy Plan. 19 (2017) 53–71, https://doi.org/10.1080/1523908X.2016.1143355.
[75] A. Lis, A.K. Stasik, Hybrid forums, knowledge deficits and the multiple uncertainties of resource extraction: negotiating the local governance of shale gas in Poland, Energy Res. Soc. Sci. 28 (2017) 29–36, https://doi.org/10.1016/J.ERSS.2017.04.003.
[76] H.C. Jenkins-Smith, C.L. Silva, K. Gupta, J.T. Ripberger, Belief system continuity and change in policy advocacy coalitions: using cultural theory to specify belief systems, coalitions, and sources of change, Policy Stud. J. 42 (2014) 484–508, https://doi.org/10.1111/psj.12071.
[77] J. Gerring, What is a case study and what is it good for? Am. Pol. Sci. Rev. (2004). https://www.jstor.org/stable/pdf/4145316.pdf?refreqid=excelsior%3Ac3aea8bc4241197cda89133c004eb045 (Accessed 3 April 2019).
[78] P.V. Marsden, Network data and measurement, Annu. Rev. Sociol. 16 (1990) 435–463, https://doi.org/10.1146/annurev.so.16.080190.002251.
[79] T. Vlček, M. Jirušek, Key factors that drive the Czech Republic coal industry, Coal Int. 263 (2015) 28–37. http://www.eru.cz/cs/ (Accessed 15 December 2018).
[80] F. Černoch, L. Lehotský, P. Ocelík, J. Osička, Ž. Vencourová, Anti-fossil frames: examining narratives of the opposition to brown coal mining in the Czech Republic, Energy Res. Soc. Sci. 54 (2019) 140–149, https://doi.org/10.1016/J.ERSS.2019.04.011.
[81] L. Lehotský, F. Černoch, J. Osička, P. Ocelík, When climate change is missing: Media discourse on coal mining in the Czech Republic, Energy Policy 129 (2019) 774–786, https://doi.org/10.1016/j.enpol.2019.02.065.
[82] T. Vlček, F. Černoch, The Energy Sector and Energy Policy of the Czech Republic, Masarykova Univerzita, Brno, 2013, https://doi.org/10.5817/CZ.MUNI.M210-6523-2013.
[83] B.D. Zumbo, A.M. Gadermann, C. Zeisser, Ordinal versions of coefficients alpha and theta for likert rating scales, J. Mod. Appl. Stat. Methods 6 (2007) 21–29, https://doi.org/10.22237/jmasm/1177992180.
[84] P.J. Rousseeuw, Silhouettes: a graphical aid to the interpretation and validation of cluster analysis, J. Comput. Appl. Math. 20 (1987) 53–65, https://doi.org/10.1016/0377-0427(87)90125-7.
[85] S. Borgatti, M. Everett, L. Freeman, UCINET 6 For Windows: Software for Social Network Analysis, (2002).
[86] H. Levene, Robust Tests for Equality of Variances, (1960).
[87] A. Langle-Flores, P. Ocelík, O. Pérez-Maqueo, The role of social networks in the sustainability transformation of Cabo Pulmo: a multiplex perspective, J. Coast. Res. (2017), https://doi.org/10.2112/SI77-014.1 2017-Spring.
[88] H.C. White, S.A. Boorman, R.L. Breiger, Social structure from multiple networks. I. Blockmodels of roles and positions, Am. J. Sociol. (1976). https://www.bebr.ufl.edu/sites/default/files/SocialStructureFromMultipleNetworks.pdf (Accessed 15 December 2018).
[89] R.A. Hanneman, M. Riddle, Introduction to Social Network Methods, (2005). http://faculty.ucr.edu/~hanneman/nettext/ (Accessed 15 December 2018).
[90] D. Krackardt, QAP partialling as a test of spuriousness, Soc. Netw. 9 (1987) 171–186, https://doi.org/10.1016/0378-8733(87)90012-8.
[91] R Core Team, R: A Language and Environment for Statistical Computing, (2014) http://www.r-project.org/.
[92] SurveyMonkey, (2018). www.surveymonkey.com.
[93] V. Hloušek, L. Kopeček, Česká republika - konsensuální nebo majoritní model demokracie? Politol. Rev. 8 (2002) 3–21. https://is.muni.cz/publication/404403?lang=cs (Accessed 15 December 2018).
[94] A. Lijphart, Patterns of Democracy: Government Forms and Performance in Thirty-Six Countries, Yale University Press, 1999.
[95] D. Ost, Illusory corporatism in Eastern Europe: neoliberal tripartism and post-communist class identities, Polit. Soc. 28 (2000) 503–530, https://doi.org/10.1177/0032329200028004004.
[96] A. Pinková, Employer organisations and business GROUPS in the Czech Republic, Polit. Cent. Eur. 11 (2015) 75–90, https://doi.org/10.1515/pce-2015-0002.
[97] J. Osička, F. Černoch, Anatomy of a black sheep: the roots of the Czech Republic's pro-nuclear energy policy, Energy Res. Soc. Sci. 27 (2017) 9–13, https://doi.org/10.1016/J.ERSS.2017.02.006.
[98] T.E. Shriver, A.E. Adams, R.L. Einwohner, Motherhood and opportunities for activism before and after the Czech Velvet revolution, Mobilization 18 (2013) 267–288. http://mobilizationjournal.org/doi/pdf/10.17813/maiq.18.3.t272388n60470456 (Accessed 15 December 2018).
[99] P. Vidomus, Oteplí se a bude líp: Česká klimaskepse v čase globálních rizik - Petr Vidomus | KOSMAS.cz - vaše internetové knihkupectví, Kosmas (2018). https://www.kosmas.cz/knihy/240774/otepli-se-a-bude-lip-ceska-klimaskepse-v-case-globalnich-rizik/ (Accessed 15 December 2018).
[100] CVVM, Veřejnost o Spotřebě Elektrické Energie, o Obnovitelných Zdrojích a Šetrnosti Výroby k Životnímu Prostředí – Květen 2017, (2017). https://cvvm.soc.cas.cz/media/com_form2content/documents/c2/a4406/f9/oe170904.pdf (Accessed 15 December 2018).
[101] IEA, Energy Policies of IEA Countries: Czech Republic 2016 Review, (2016). https://webstore.iea.org/energy-policies-of-iea-countries-czech-republic-2016-review (Accessed 15 December 2018).
[102] IEA, Key World Energy Statistics, (2017). https://www.iea.org/publications/freepublications/publication/KeyWorld2017.pdf (Accessed 15 December 2018).
[103] WEC, Coal in Czech Republic, (2016). https://www.worldenergy.org/data/resources/country/czech-republic/coal/ (Accessed 15 December 2018).
[104] M. Sivek, T. Vlček, P. Kavina, J. Jirásek, Lifting lignite mining limits – correction of the Czech Republic energy policy, Energy Sources Part B 12 (2017) 519–525, https://doi.org/10.1080/15567249.2016.1219789.
[105] B. Frantál, Living on coal: mined-out identity, community displacement and forming of anti-coal resistance in the Most region, Czech Republic, Resour. Policy 49 (2016) 385–393, https://doi.org/10.1016/j.resourpol.2016.07.011.
[106] O. Císař, K. Vráblíková, Transnational activism of social movement organizations: the effect of European Union funding on local groups in the Czech Republic, Eur. Union Polit. 14 (2013) 140–160, https://doi.org/10.1177/1465116512456311.
[107] A. Fagan, Environment and Democracy in the Czech Republic: The Environmental Movement in the Transition Process, first ed., Edward Elgar, Cheltenham, 2004.

[108] Ministry of Industry and Trade, MPO předložilo studie k Problematice Těžebních Limitů | MPO, 2015, (2015). https://www.mpo.cz/dokument161557.html (Accessed 16 December 2018).
[109] Ministry of Industry and Trade, Vláda Rozhodla o Zrušení Limitů Těžby na Dole Bílina | MPO, (2015). https://www.mpo.cz/dokument165352.html (Accessed 16 December 2018).
[110] Ministry of Industry and Trade, State Energy Policy, (2015). https://www.mpo.cz/dokument161030.html (Accessed 16 December 2018).
[111] A. Cherp, V. Vinichenko, J. Jewell, E. Brutschin, B. Sovacool, Integrating techno-economic, socio-technical and political perspectives on national energy transitions: a meta-theoretical framework, Energy Res. Soc. Sci. 37 (2018) 175–190, https://doi.org/10.1016/j.erss.2017.09.015.
[112] P.A. Sabatier, S. Hunter, S. Mclaughlin, The Devil Shift: Perceptions and Misperceptions of Opponents, (1987). https://about.jstor.org/terms (Accessed 15 December 2018).
[113] P.A. Sabatier, M.A. Zafonte, Policy knowledge: advocacy organizations, in: N.J. Smelser, B. Baltes (Eds.), Int. Encycl. Soc. Behav. Sci. Elsevier, 2001. https://philpapers.org/rec/SABPKA (Accessed 15 December 2018).
[114] J. Dyduch, Europeanization of the Energy Policy Within the European Union's System of Governance, (2015). https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2633218 (Accessed 16 December 2018).
[115] K. Tews, Europeanization of energy and climate policy: the struggle between competing ideas of coordinating energy transitions, J. Environ. Dev. 24 (2011) 267–291, https://doi.org/10.1177/1070496515591578.
[116] Ministry of Trade and Industry, Aktualizace "Surovinové Politiky České Republiky v Oblasti Nerostných Surovin a Jejich Zdrojů" - 2016 | MPO, (2016). https://www.mpo.cz/cz/stavebnictvi-a-suroviny/surovinova-politika/statni-surovinova-politika-nerostne-suroviny-v-cr/aktualizace-_surovinove-politiky-ceske-republiky-v-oblasti-nerostnych-surovin-a-jejich-zdroju_-2016-223504/ (Accessed 16 December 2018).
[117] Ministry of Industry and Trade, Zpráva o Plnění Nástrojů Státní Energetické Koncepce ČR do Roku 2017, (2018). https://www.mpo.cz/assets/cz/energetika/statni-energeticka-politika/2018/10/Zprava-o-plneni-nastroju-SEK-do-roku-2017.pdf (Accessed 16 December 2018).
[118] G. Decree, Usneseni vlády České republiky ze dne 19. října 2015 č. 827, (2015) 2 https://apps.odok.cz/attachment/-/down/IHOAA3RKBT3O.
[119] E. Schlager, Policy making and collective action: Defining coalitions within the advocacy coalition framework, Policy Sci. 28 (1995) 243–270, https://doi.org/10.1007/BF01000289.
[120] A. Stritch, The advocacy coalition framework and nascent subsystems: trade union disclosure policy in Canada, Policy Stud. J. 43 (2015) 437–455, https://doi.org/10.1111/psj.12112.
[121] P. Cairney, T. Heikkila, A comparison of theories of the policy process, in: P.A. Sabatier, C.M. Weible (Eds.), Theor. Policy Process, 2014, pp. 363–389.
[122] W. Voorberg, V. Bekkers, K. Timeus, P. Tonurist, L. Tummers, Changing public service delivery: learning in co-creation, Policy Soc. 36 (2017) 178–194, https://doi.org/10.1080/14494035.2017.1323711.
[123] L.M. Poloni-Staudinger, Are consensus democracies more environmentally effective? Env. Polit. 17 (2008) 410–430, https://doi.org/10.1080/09644010802055634.
[124] M. Jänicke, Ecological modernisation: new perspectives, J. Clean. Prod. 16 (2008) 557–565, https://doi.org/10.1016/J.JCLEPRO.2007.02.011.
[125] G. Marston, Tampering with the evidence : a critical appraisal of evidence-based policy-making, Aust. Rev. Public Aff. 3 (2008) 143–163.
[126] D.C. Christopoulos, K. Ingold, Exceptional or just well connected? Political entrepreneurs and brokers in policy making, Eur. Polit. Sci. Rev. (2014), http://dx.doi.org/10.1017/S1755773914000277.
[127] M. Howlett, I. Mukherjee, J. Koppenjan, Policy learning and policy networks in theory and practice: the role of policy brokers in the Indonesian biodiesel policy network, Policy Soc. 36 (2017) 233–250, https://doi.org/10.1080/14494035.2017.1321230.
[128] J. Habermas, Communication and the Evolution of Society, Beacon Press, 1979.
[129] M. Kowarsch, J. Garard, P. Riousset, D. Lenzi, M.J. Dorsch, B. Knopf, J.-A. Harrs, O. Edenhofer, Scientific assessments to facilitate deliberative policy learning, Palgrave Commun. 2 (2016) 16092, https://doi.org/10.1057/palcomms.2016.92.
[130] B.K. Sovacool, J. Axsen, S. Sorrell, Promoting novelty, rigor, and style in energy social science: towards codes of practice for appropriate methods and research design, Energy Res. Soc. Sci. 45 (2018) 12–42, https://doi.org/10.1016/J.ERSS.2018.07.007.
[131] J. Goodman, J.P. Marshall, Problems of methodology and method in climate and energy research: socialising climate change? Energy Res. Soc. Sci. 45 (2018) 1–11, https://doi.org/10.1016/j.erss.2018.08.010.
[132] G. Robins, Social networks, exponential random graph (p ∗) models for, in: D. Lusher, J. Koskinen, G. Robins (Eds.), Comput. Complex. Theory, Tech. Appl. Cambridge University Press, Cambridge, 2012, pp. 2953–2967, , https://doi.org/10.1007/978-1-4614-1800-9_182.
[133] M. Howlett, B. Cashore, The dependent variable problem in the study of policy change: understanding policy change as a methodological problem, J. Comp. Policy Anal. Res. Pract. 11 (2009) 33–46, https://doi.org/10.1080/13876980802648144.
[134] M. Angst, A. Widmer, M. Fischer, K. Ingold, Connectors and coordinators in natural resource governance: insights from Swiss water supply, Ecol. Soc. 23 (2018), https://doi.org/10.5751/ES-10030-230201 art1.
[135] Y.R. Nooraie, J.E.M. Sale, A. Marin, L.E. Ross, Social network analysis: an example of fusion between quantitative and qualitative methods, J. Mix. Methods Res. 11 (2018), https://doi.org/10.1177/1558689818804060 155868981880406.
[136] D.P. Dolowitz, D. Marsh, Learning from abroad: the role of policy transfer in contemporary policy-making, Governance 13 (2000) 5–23, https://doi.org/10.1111/0952-1895.00121.
[137] C.J. Bennett, M. Howlett, The lessons of learning: Reconciling theories of policy learning and policy change, Policy Sci. 25 (1992) 275–294, https://doi.org/10.1007/BF00138786.
[138] K. Thelen, How institutions evolve, in: J. Mahoney, D. Rueschemeyer (Eds.), Comp. Hist. Anal. Soc. Sci. Cambridge University Press, Cambridge, 2003, pp. 208–240, , https://doi.org/10.1017/CBO9780511803963.007.
[139] F.W. Geels, F. Kern, G. Fuchs, N. Hinderer, G. Kungl, J. Mylan, M. Neukirch, S. Wassermann, The enactment of socio-technical transition pathways: a reformulated typology and a comparative multi-level analysis of the German and UK low-carbon electricity transitions (1990–2014), Res. Policy 45 (2016) 896–913, https://doi.org/10.1016/J.RESPOL.2016.01.015.
[140] V. Masson-Delmotte, P. Zhai, H.-O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J.B.R. Matthews, Y. Chen, X. Zhou, M.I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, T. Waterfield, Global Warming of 1.5 °C. An IPCC Special Report, (2018). https://www.ipcc.ch/site/assets/uploads/sites/2/2018/07/SR15_SPM_High_Res.pdf (Accessed 16 December 2018).