

From Lenin to LNG: Exploring culture, geopolitics, and energy independence in Lithuania

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Abstract

This article explores the reorientation of Lithuania's energy system away from Russia and efforts at integrating into the European Union's energy market. Utilizing an energy culture perspective, which draws on geographic concepts of cultural geopolitics and cultural geography, issues of power and dominance and valorization of energy relations provide a unique conceptual framing. A review of energy cultures literature demonstrates the broader use of the term, but a lack of critical reflection on how energy cultures are created. The results demonstrate energy cultures provide a means to understand power relations and representation of cultural struggles. In addition, the cultural influence of the Soviet-era lingers within Lithuanian society, but political action re-orientates and delivers low energy prices while building a new EU integrated energy system, thereby reducing Russia's influence. Three descriptive statements are developed and applied to the case study, which assists in answering research questions, and eliciting a deeper reflection on the role of culture in energy relations. The narrow focus of the article excludes wider consideration of culturally connected concepts of energy justice or national innovation systems.

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1 Introduction: Power of energy culture

'Energy culture' denotes social experiences and practices within an energy system. Within energy transitions literature, the term is limited but descriptive of social relations, national approaches, security, ties to natural resources, and simply – social participation within an

energy system (Stephenson et al. 2010; Sovacool 2016; Rosicki 2018; Sheller 2014).

Nonetheless, culture is a loaded term that describes and exposes power relations and contestation of social values (Mitchell 2000) along with geopolitical tensions between nation-states (Toal and Agnew 2002). This article analyzes how struggles in power relations create unique energy cultures, and which are visible in the orientation of Lithuania's energy system. The discipline of geography brings the necessary tools to expose these power relations within society (Mitchell 2000) and territorialization between nation-states (Agnew and Corbridge 1995). Energy cultures are reflective of deeper state structures (Sheller 2014). Geography reads these deeper relations on the landscape (Sauer 1925), within social struggles (Harvey 1973), and between countries in energy transitions (Bridge et al. 2013; Toal and Agnew 2002). Through a literature review of energy cultures the benefits from this geographic perspective produce research questions which guide the article and examination of the case study.

A case study of Lithuania provides an example of shifting power relations and cultural transformation from one of energy dependence to energy independence. The country demonstrates a strong contrast between the Soviet era and a post-Soviet era energy system. Within less than ten years, the country transformed its energy system from dependence on Russian resources and technologies to independence and integration into the EU energy market (Pakalkaite 2016; Pakalkaite and Posaner 2019). Drawing from LaBelle's framing of energy cultures (LaBelle 2020) a twofold contribution is made: The findings 1) articulate how relational struggles create culture which influences the choice of energy resources and technologies and, 2) explain the role of culture in the geopolitical orientation of an energy system.

This article, through a geographic lens, asks four research questions within the confines of the Lithuanian case study. The research questions are divided into two groupings: first there is a broader geopolitical interpretation of Lithuania's energy culture and second, a more narrowly defined domestic examination of energy culture. The questions are: 1) Who creates an energy culture of geopolitics in Lithuania? 2) Why is the energy culture in Lithuania changed? 3) How is Lithuania's energy culture of geopolitics changed? And, 4) What is Lithuania's energy culture? These questions are tightly connected and developed in conjunction with a review of the energy cultures literature and assist developing a deeper understanding of Lithuania's interactions between domestic socio-political relations and international geopolitical relations. The article is laid out as follows: Section 2 contains a review of existing energy cultural approaches in the energy transitions literature, exposing energy culture as an underdeveloped concept unable to explain the creation of culture or why culture plays an important role in energy systems. Section 3 covers the conceptual contribution this article makes by integrating geographic concepts of geopolitics and cultural geography to explain what and how energy culture assists the explanation of politically and socially led energy transformation. Section 4 describes a case study of Lithuania's efforts to break away from Russian energy resources and technologies and integrate into the EU's energy system while boosting the country's energy security. Section 5 provides a discussion by answering the research questions and exploring the role of culture as a means to uncover power relations and historical legacies. Section 6 concludes the article by outlining broader uses and consideration of energy cultures to inform national efforts to tackle climate change and develop a just energy transition.

2 Literature review: Theorizing energy and culture

This section provides an overall review of energy culture literature. The section reviews a range of approaches that are *explicit* in their use of the term, ‘energy culture,’ while also highlighting articles that use energy culture as an *implicit* relational description to understand energy transitions. The literature, therefore, is organized between an ‘explicit’ (viewable) and an ‘implicit’ (relational) view of energy culture. This framing assists identifying different approaches and interpretations of energy cultures. A note on the terminology in use, ‘culture,’ and ‘energy culture,’ places the latter as a subset of the former. Thus, ‘culture’ can be broadly defined and discussed irrespective of energy; whereas, ‘energy culture’ describes relations within energy systems that can be both explicit and implicit. This division assists the ability to refine the analysis.

2.1 Explicit energy culture

Security is a strong informer of the explicit use of energy cultures. Sovacool develops six categories of ‘energy security culture,’ by asking, “how do perceptions of energy security vary by culture” (2016, 811)? Through this lens, energy cultures are viewed as national interpretations of energy security issues and shown to influence national policies. This aligns with the empirical example of how the Polish perspective on the Soviet energy system informs Polish energy security perspectives in an ‘EU energy culture’ (Pronińska 2013; Rosicki 2018). There emerges a cultural fight over a high-intensity Soviet (coal) model or one accepting of European clean energy standards (Pronińska 2013, 55), which reflect an EU division of ‘clean’ or ‘dirty’ energy cultures (Rosicki 2018). This interpretation uses conflict between nation-states to demonstrate the role of geopolitical cultures impacting foreign and domestic energy and security policies. In all three studies, there is an assumption of different energy cultures, but there is a lack of critical

examination of who, within these geopolitical blocks, is creating the energy culture. This lack of reflection prompts the creation of the question: *Who creates energy culture?*

If there is a 'who' creating energy culture, then it is important to understand the relation to society and why energy culture is created. Other authors provide this context by seeing energy culture is in *everyday lived experiences*. Ruotsalainen et al. describe a new (sub)cultural melee around a reconfigured energy system, with "self-organizing citizens" participate in a new decentralized and disconnected energy system (2017, 237). Another study examines the way of life in the United States of America as a means of expressing its industrial and resource history by the "sheer abundance and limitless consumption" of energy (Sovacool 2009, 370). People consume energy because it is abundant – and part of the overall *culture*. In both articles, it is the everyday use of energy that describes and reflects the energy culture. The limitation of this social approach is an uncritical interpretation of both who is creating, sustaining or challenging the cultural narratives of energy use (such as who is selling large SUVs); this can also prompt a need for a deeper understanding into energy culture and ask, *Why is energy culture created?* The question also prompts the need to understand how energy culture is created, which is discussed next.

Building a better understanding of how energy culture is created is the Energy Cultures Framework. This is the most operationalized and critically reflected interpretation of energy culture (Stephenson 2018). The concept assists in understanding practices around fuel poverty, buying habits, and generational energy choices (Stephenson et al. 2010; Stephenson 2018). It places individual behavior at the center of a broader (energy) technology system and adjusts to the (non-)integration of technology. Nonetheless, the focus lies on consumption of energy and

excludes a whole systems approach to the production of energy. Energy culture from this approach is created as a social practice around consumption viewed within an organization. Connected to understanding social practices and conforming within an energy system is Sheller's (2014) approach, which provides a whole systems orientation of 'energy culture.' In this interpretation of energy culture, there is an emphasis on socio-technological characteristics that shape the use of energy and the perpetuation of an energy culture. Here, energy culture draws on the "circulation of energy" to describe "how built forms and material assemblage" develop ways of life around energy consumption practices, while also perpetuating "particular energy use patterns" (Sheller 2014, 128–29).

In both the Energy Cultures Framework (Stephenson 2018) and the regime approach (Sheller 2014), there is a structuralist construction of socio-political materiality stemming from practices influenced by technology. Nonetheless, in both these approaches, the production of energy culture is assumed to exist and underscores the importance of understanding *how* energy culture is produced. This structuralist perspective and analysis of social practices provides an important grounding to inform the question, *How is energy culture created?*

2.2 Implicit energy culture

The implicit framing of energy cultures provides a means to communicate *relational* experiences of living and creating energy cultures. Within this framing, another set of literature engages in the power of stories and narratives to communicate the everyday lived experiences. This implicit engagement with energy culture can provide perspectives missed by more formal framing of energy transitions described in the previous section. A quote from a special issue of this journal underscores the importance of stories and narratives:

Stories are used to communicate with, influence, and engage audiences; they serve as artefacts to be investigated in terms of content, actors, relationships, power, and structure; they can be used to gather information, provide insight,

and reframe evidence in ways that more science-ordered formats miss. But they are not benign or neutral... (Moezzi, Janda, and Rotmann 2017, 1).

It is this investigative task and a “purposeful cultural turn,” where climatic fears influence the distribution and emerging culture of dealing with climate change (Smith et al. 2017, 287). Engagement with the landscape and lived experiences can strongly highlight our perceptions of energy transitions and, importantly, influence government policies. More specifically, implicit energy cultures hold significant *geopolitical implications*.

Dalby (2018) makes the case that climate change denial present in the Trump administration’s foreign and energy policy is reflective of an Imperialist (geopolitical) perspective, whereby, conservative cultural themes of national sovereignty, fossil fuel independence, and power status asserted through military, trade and natural resources are fulfilled by the abrogation of international treaties (Dalby 2018; Sevastopulo and Chazan 2019). Culture, in this context, influences a new geopolitical order of contestation rather than cooperation. This implicit relational perspective is reflective of the explicit analysis of energy security cultures described above (Sovacool 2016). This macro-view offers up broader consequences and highlights the importance of how social and political (socio-political) cultural interpretations of energy relations materialize through geopolitical and security actions.

Bottom-up social pressures inform the top-down security perspectives which reflective broader approaches in energy transitions literature. There is a warning against a top-down analysis of social influences on the energy system, particularly those perpetuating the energy trilemma and politically constructed notions of energy poverty (Cloke, Mohr, and Brown 2017). Sociotechnical imaginaries shape energy discourses, prescribe a directionality to

energy transitions, and are top-heavy and force a prescriptive direction (Cloke, Mohr, and Brown 2017, 264). In contrast, a bottom-up perspective provides an awareness of the sociocultural context, while also exposing economic and technical barriers to energy transitions (Cloke, Mohr, and Brown 2017, 263–64). Every day lived experiences speak of transitions, whereas theories and frameworks force an observable perspective on material changes, but without an explanation of the creation and contestation between cultures. Meanings of the landscape emerge in different forms. The simple method of ‘reading’ implicit energy cultures can convey non-traditional hierarchical meanings to participants. Meanings can be ‘seen’ in both symbolic actions “such as changing light bulbs, buying organic food” (Hagbert and Bradley 2017, 241), or through reading the landscape. As Macdonald (2017) expresses, “It is about seeing pipelines as cultural objects” (Macdonald 2017, 39). The ‘petrocultures’ literature embraces a humanities approach to energy (Wilson, Carlson, and Szeman 2017) through the reading of symbols and artifacts. The materiality of energy transitions can be examined and expressed in a variety of ways.

Both observable (explicit) and deeper meaning (implicit) uses of energy culture assist the exploration and ability to answer the final research question. Meanings expressed on landscapes and those created through social interactions provide sites to understand, what is energy culture. The two approaches complement and provide a starting point help shape the final research question: *What is energy culture?* The next section establishes a geographic approach to explore and explain culture within a socio-political context of nation-states and society.

3 Geographies of Culture and Geopolitics

The geographic perspective put forth to elucidate energy cultures draws on well-established methods and conceptual framings of geography in energy transitions. Other disciplines analyze cultures, such as

anthropology (Geertz 1973) and sociology (Giddens 1982). Energy culture, assessed through a geographic perspective, highlights spatial and scale aspects of the energy sector. Cultural geography involves understanding the process of creating *relations* within and between spaces at different scales. 'Culture' is not a "thing" but rather a struggle over "a set of social relations, relations shot through with structures of power, structures of dominance and subordination" (Mitchell 2000, XV). Geography provides a perspective and tools to dig into these power struggles creating culture.

These cultural struggles involve the reconfiguration of spatial patterns of economic and social activities, which are "fundamentally a geographical process" (Bridge et al. 2013, 331). Geopolitical cultures (Toal and Agnew 2002) scale-up these power relations from within the state to between states. Geography, in a very simple explanation, contains the spatial and scalar tools to understand the physical and social relations which contest and create cultures within an interconnected domestic and international energy system. Geography, in short, exposes how individuals and societies secure energy, or power, or both, through geographic cultural struggles structured through power relations (Bridge et al. 2013, 331–32).

Geography understands spatial networks of society *and* infrastructure. Socio-political interactions (cultures) influence the territorialization of energy infrastructure (energy systems) and the surrounding politics of the state (geopolitics) around energy technologies (Bouzarovski, Bradshaw, and Wochnik 2015). Therefore, energy technologies and resources are not benign, but expressions of power relations. Geography captures and explains social, economic and political relations at different scales along with their spatial relations. The next section will explain why and how a geopolitics of culture and cultural geography contribute to an examination of energy culture within the state and between states.

3.1 Cultures of Geopolitics

Since the 1970s, cultural geography has provided the tools to create a political-economic perspective in our everyday lives. This British approach became engaged in social questions and

gained political relevancy that argued, “culture is politics” (Mitchell 2000, 36), thereby connecting culture with political (in)action. Cultural and political geographies became more intertwined, examining cultural identity, political discourse, and reproduction of everyday life (Toal and Agnew 2002, 456):

A culturally informed political geography is about identifying and showing the mutually constitutive effects of cultural signs and symbols, on the one hand, and political acts, on the other (Toal and Agnew 2002, 456).

Thus, geography developed from reading culture on the landscape (Sauer 1925) to reading culture in political-economic power (Harvey 1973). The new reading produced a new critical approach to geopolitics (the geopolitics of culture) and culture in geography (cultural geography). Rather than seeing military movements as projections of state power, a cultural reading of geopolitics provides a lens onto the social, political, and ideologies within and between states which control the ‘physical determinants’ (O Tuathail and Agnew 1992, 192), such as ships, railroads, and pipelines. It is cultural interpretations and discussions which prompt leaders to create infrastructure and move militaries. By using cultural observations to explain geopolitical actions, each country provides a “tradition of discourse and debate about territorial nation-state identity and its relationship to the wider world” (Toal and Agnew 2002, 457). Physical artifacts on the landscape and political-economic systems are reflections of cultural debates within a nation-state.

Culture provides social context but also interconnects politics and economics. A broad cultural approach to geopolitics states O’Tuathail, informs a dialectical relationship between economics and politics; culture is a mediating force, thereby contextualizing geopolitics in history and signifying specific practices (Dalby 2008, 417). Expressions of a dominant culture are present in politics and economics, but also the social struggles around dominant and sub-cultures.

Therefore, there is a necessity to be sensitive when reading geopolitical expressions of power, culture assists explaining the expression of politics and economics, but culture is rich in struggles and opposition. Sensitivity to political-economic relations matches the call by Hepple in the development of geopolitics to be “sensitive [to] threading together of the geographical with the historical, social and political” (Hepple 1986, 32). Cultural geopolitics express internal struggles that are highly complex and dependent on both internal and external power structures.

Therefore, developing both an implicit and explicit reading of culture is necessary.

Geopolitics is the expression of internal cultural struggles and perceived cultural power expressed in both implicit and explicit ways. Traditional geopolitics concerns itself with the influence of the physical landscape (explicit) on the decisions made by citizens and leaders.

However, a new form of geopolitics engages in questioning the cultural landscape (implicit) of a country and asking, “How does the *geopolitical culture* of a state spatialize world politics and fill it with certain defining dramas and dangers, friends and enemies” (Toal and Agnew 2002, 457)?

Culturally sensitive geopolitics seeks to question who creates culture while also asking how the expression of culture influences the relations between nation-states. Cultural geography, discussed next, provides a perspective on how culture is created within a state, thereby also influencing relations between states.

3.2 Cultural geography

Cultural geography goes deeper into the state – or lived experiences – it provides a critical political-economic approach, questioning the role of culture in identifying human expressive practices “where values are renewed, created, and contested” (Inglis 1993: 38, as cited by Mitchell 2000, 71). Power relations in society produce meaning and value. For example, studies of inequalities and social justice expose these relations (Mitchell 2000, 34–35) This Marxist

bent, signified by David Harvey's work (Harvey 1982; 1973) identifies culture as a force producing collective action and profits, through a *set of norms* which bind members.

Enforcement, or a fight over norms, results in a political-economic approach to 'culture as politics.' (Mitchell 2000, 72–73). Culture is created through political (and economic) interactions often in struggles that clarify different alignments and power centers of society and those that possess money or resources.

Political geography directed at the relations and contestation between states produces geopolitics. Cultural geography's examination of contested political-economic relations exposes the production of culture. Social interactions and struggles create culture, reflecting power relations. Power holds value because of its use in economic and political relations. Therefore, culture holds value. More precisely, culture is translatable into power and control of the economic-political structure society operates within. Culture is valorized as a productive force, holding and accruing power in a political economy. Communities will fight for representation and protection of their culture, thereby exposing relationships and allegiances within and between social groupings, thereby exposing the production of culture (Mitchell 2000, 73):

My argument is that it is in the interaction – the struggle – between the production of 'culture' and its use that 'culture' is produced, not as a thing, but as a relationship. So when I ask *who* produced culture, I always turn to the study of *relationships*; when I ask *why* it is produced, I turn to questions of power (Mitchell 2000, xviii).

Understanding the power value of culture requires asking two questions: a) 'who is producing culture?' b) and, 'why are they producing it?' Culture holds value and power (Mitchell 2000, 71). More succinctly: culture is politics, culture is power, and culture is relationships.

Culture is not a benign reflection of folk customs. Rather, it reflects the social struggle within an economic-political system that sees culture as a reflection of power. Just as the astronomer

uses a radio telescope to view the stars, geographers can use culture to perceive deeper power relations and decipher the surrounding political-economic structures shaping social relations. 'Geopolitics of culture' reflects the internal power relations of nation-states and are viewed by 'reading' the landscape or contested discourse between countries. Likewise, the production and 'reading' of energy culture reflect socio-political interactions within an energy system. A political-economic structure influences social interactions and the expression of an energy culture. The following section provides a brief case study of how Lithuania altered its energy culture, thereby contesting established power relations and exposing the political-economic structure. Afterward, Section 5 provides a discussion on how the case study demonstrates the contestation within energy culture and answers the research questions.

4 Case study: Lithuania energy cultures

The methods of this article deliver both a conceptual framing and an empirical approach to describe energy culture. The conceptual methods build up and explore culture through a critical geographical lens; this means taking apart approaches originally built for explaining cultural interactions through social or security perspectives. Cultural geography enables "ways of thinking and being" in power relations (Cresswell 2010, 173). Likewise, critical geopolitics underscores how cultural identities serve as a source of power (or domination) between nation-states (O Tuathail 1996; Toal and Agnew 2002). Also, like Bouzarovski et al., there is justification for exploring energy poverty in a broader infrastructure system, and through institutional change (Bouzarovski et al. 2015), Lithuania provides the context to explore a massive re-orientation of the energy infrastructure and institutions reflective of both geopolitics and socio-political change.

The choice of Lithuania as a site of the case study rests on the justification of the rapid diversification away from Russia. Only Poland and Lithuania are former eastern bloc countries to build LNG terminals to

diversify gas sources away from Russia. Further, Soviet and Russian nuclear technology plays an important role in fostering technical and political relations between countries. Lithuania and Bulgaria shut down Soviet-era nuclear reactors to join the EU, but only Lithuania ended its nuclear program with the closure of the Ignalina nuclear power plant. Along with a wider understanding that post-socialist countries “have experienced a much more complex and variegated path of energy restructuring, underpinned by issues of power, space, path-dependency, and place-making” (Bouzarovski 2009, 461). Lithuania provides both a site of energy diversification and social, political and economic restructuring to adapt to new energy infrastructure and orientation of networks westward within the EU’s energy market (Pakalkaite and Posaner 2019).

Lithuania also provides an interesting site of examination reflective of a broader shift in the discipline of geography and interpretation after the Cold War. In the early 2000s, imperialism linked to geographies of state-less terrorism underscored the post-Cold War era (Dalby 2008); however, by 2018 geopolitical rivalries and military competition fueled “combustion [as] the key driver of climate change and contemporary patterns of Anthropocene geopolitics” (Dalby 2018, 720). Within geography, there is now a return to reflect on the rise of the imperial powers of the beneficiaries of hydrocarbons (Dalby 2018, 720) and the role of energy infrastructure (Bouzarovski, Bradshaw, and Wochnik 2015). Cultural identities, practices, and assertion of power are visible in the conceptual and empirical lenses of geography (Jessop and Sum 2018). These perspectives are essential for framing and understanding empirical research in Lithuania. Discussed next is how qualitative methods were used to construct a narrative perspective on the geopolitics of energy culture in Lithuania.

The research in this article is reflective of six assumptions underlining qualitative research, these are: 1) concern with the process, rather than outcomes; 2) interested in meaning, experiences, and how people give meaning to the structures of the world; 3) the researcher is the primary instrument for data collection; 4) fieldwork is necessary; 5) research describes the world and meanings from words,

experiences or pictures; 6) an inductive approach works through abstractions, concepts, and theories (Creswell 1998, 145). Each step, described next, structures the explanation of methods in this study.

The empirical research focuses on describing the (1) process of cultural transformation within Lithuania's energy system. In order to provide this approach, a narrative approach reflects a wide collection of interviews, experience from the researcher and secondary data collection. This approach aligns with that described by Punch (1998), narratives and stories, structured into the research design at the start, deal more holistically with qualitative data; this is valuable for reflecting lived experiences (Punch 1998, 222). The historical context of Lithuania as part of the Soviet Union along with EU Membership are relevant experiences for interviewees. Their positionality is important in terms of their experiences and expectations of the development of Lithuania's energy system. For example, the mayor of Visaginas, where the nuclear power plants is the largest employer held a positive view of Soviet engineering (personal communication Straupaite 2018), the vice minister of energy did not (personal communication Sabaitiene 2018). Both provide necessary context to Lithuania's energy culture and represent how narratives change.

The above example describes (2) how people give meanings to experiences and structure their world views. The use of a case study approach enables accounting for these experiences because it "constructs a record of the past and seeks to tell a story of the life and times a specific group of people....[accounting for] historical continuities and changes, searching for ways in which patterns remain the same or vary over time" (Feagin, Orum, and Sjoberg 1991, 5). The Lithuanian case study describes decisions over time and how they affect the development of the energy system. This approach also requires an effective experiential data collection method to capture both the lived experiences and assess the perceptions of historical change.

Structuring the research design, (3) the researcher (this author) undertook to collect primary data in a country visit between May 21 to June 7, 2018. Three cities (Kaunas, Klaipeda, and Vilnius) were visited, and three site visits were arranged by a Lithuanian research assistant with knowledge and experience in the country's energy sector. The site visits included a private visit to the FSRU Independence ship and a meeting with the captain, a conference tour of the Achema fertilizer plant (consumer of 50% of Lithuania's gas) and a tourist visit of the Ignalina Nuclear Power Plant, while accompanied by a fellow tourist – a nuclear engineer trained to work on the facility. Attendance at an international energy conference at the Lithuanian Energy Institute assisted understanding from an engineering perspective the long-term academic changes resulting from the closure of the Ignalina nuclear power plant. These tours and interactions demonstrate the importance of fieldwork (4) by allowing direct observations of energy artifacts (1998, 223) and informal knowledge gained by experiencing the sites of examination.

In order to fulfill the fifth assumption guiding qualitative research, that is, 5) 'research describes the world and meanings from words, experiences or pictures' (Creswell 1998); this is done through data collection methods and procedures for analysis of the data. Both data collection and analysis rely on methods associated with in-depth studies. These included the use of primary in-depth interviews, both informal conversational interviews and pre-scheduled open-ended (Patton 1990, 281). Secondary research material (documents and studies) were collected before and after fieldwork. The research for the analysis aligns with six forms of data collection identified by Yin: "documents, archival records, interviews, direct observations, participant observation, and physical artifacts" (Yin 1989 cited by Creswell 1998, 223).

The study design sought to have a cross-section of interviews able to reflect on the shift away from Russian nuclear and gas and into other technologies or diversification of resource supplies. In May and June, 2018, 24 semi-structured in-person interviews were conducted in Lithuania (appendix a). Interviewee selection was based on a cross-section of government (political and non-political

appointees) (6), business (private and public) (11), NGOs (6) and an academic (1) (appendix a) from a range of perspectives, but more centered on policies, gas, nuclear and renewables. These interviews were open-ended and semi-structured. Unstructured casual interviews were conducted onsite at the gas and nuclear installations as well as the conference venue, but these interviews are not included in the overall count. Notes were taken for each interview, including recordings in more formal settings, these were later transcribed.

Analysis of the interviews occurred along the following procedures: a) review of notes and transcription; b) collection of meanings and understandings of key events or reasoning for policy actions; c) assemblage of key statements and quotes reflecting agreement or disagreement of an overall narrative; d) categorization of interviewee statements along the following categories: gas, biomass, prices, nuclear, RES, interconnectors, privatization, overview, justification; e) Comparison with secondary data, such as international reports and academic sources.

This process of analysis conforms with common features of qualitative data analysis, with “qualitative analysis remains much closer to codified common sense than the complexities of statistical analysis” (Robson 2002, 45). By drawing out reflective data points aligned with technologies, both the positionality of the interviewees can be observed (such as pro or anti-nuclear) and a piece of the overall narrative around policies and technologies is noticeable. Understanding personal and social relations with technologies provide a connection to produce a grounded cultural narrative around social and political energy relations in Lithuania.

Finally, the methods describe 6) an inductive approach working through abstractions, concepts, and theories (Creswell 1998, 145). The connection returns to the beginning of this section with the shift – within geography – towards accounting for spatial alterations within energy systems (Bouzarovski et al. 2015) and reflections on the new geopolitics of imperial powers (Dalby 2018) and geopolitics of cultures

(Toal and Agnew 2002). Lithuania provides a site to consider how these larger geopolitics influence and are interpreted through a specific culture (Mitchell 2000), in this case, the energy culture of Lithuania.

4.1 Lithuanian energy culture: Relationally transformative

Lithuania, in the 1990s, was typical of a post-communist country. The heavy industry collapsed along with power demand resulting in oversupply with little export potential. Energy prices were below market price, there was limited or no metering of energy production and consumption, and there was little incentive for energy efficiency (IAEA 2004, 11). Lithuania reflected the broader Soviet perspective that “the right to energy was considered a universal entitlement, rather than a service to be paid for” (Bouzarovski 2009, 457). The five decades of Communist rule instilled a common set of ideological practices inserting energy policies into social and industrial policies (Bouzarovski 2009, 454). The lack of resources in Eastern Europe, therefore, made the region susceptible to greater dependence on the supplier of resources and technologies (the Soviet Union) (Bouzarovski 2009, 454). A distinct energy culture developed based on relations during and after the Soviet period based on low prices and the provision of technology and resources from outside Lithuania.

4.2 The Landscape of Infrastructure: Physical expression of relations

The design of the Soviet-era infrastructure was based on the electricity and gas network extending from the Soviet States to the eastern satellites, and not between them (Orban 2008). For a satellite state, breaking away from this explicit dependence of network technologies and resources would entail a high cost associated with building new infrastructure. An implicit threat also exists between countries wanting to change this relationship. There is a threat of higher prices from Russia and the political implications of dealing with higher consumer prices by shifting towards a more independent energy system.

Nonetheless, in the case of Lithuania and the nuclear power plant, it was forced to choose between staying with Soviet-era technology or joining the EU. As will be demonstrated, the short term costs

were high, but now Lithuania is gradually becoming less reliant on Russia for its energy supplies, dropping, “from 80% in 2012 to 55% in 2016 and 35% in 2020” (World Nuclear Association 2017).

Diversification and replacement of energy resources and technology are enabling Lithuania to become less dependent on Russia.

The design of the Lithuanian energy system meant it was fully dependent on Soviet and then Russian nuclear technology, gas, oil, and electricity imports. Substantial progress has been made since Lithuania’s EU membership, enabling it to ‘repolarize’ its energy system, from east to west. The first major change came during EU negotiations when Lithuania agreed to close the Ignalina Nuclear Power Plant. The Soviet-era plant operated from 1983 to 2010. It held two reactors producing 1500 MW each. In 1993, it produced almost 90 percent of the country's electricity. The reactor design was the same as the Chernobyl Nuclear Power Plant, and despite investments to improve the safety of the plant, membership to the EU was conditional on decommissioning the plant.

The projected scenarios after the closure of Ignalina were viewed as increasing the use (and dependency) on imported natural gas, building a new nuclear unit, or keeping one unit of the Ignalina NPP operating until 2018 (which did not happen). Each scenario projected a rapid and significant increase in the price of almost double the cost of production from 2005 to 2010 levels (IAEA 2004, 6). Therefore, the prospects of this switch were increasing Lithuania’s dependency rather than decreasing. In 2009, after the closure of Ignalina NPP, Lithuania became a net importer of electricity, mainly from Russia. Imported natural gas for electricity production replaced domestic nuclear electricity generation (European Commission 2015), demonstrating the shift from nuclear to natural gas for electricity production between 2009 and 2010 (Figure 1).

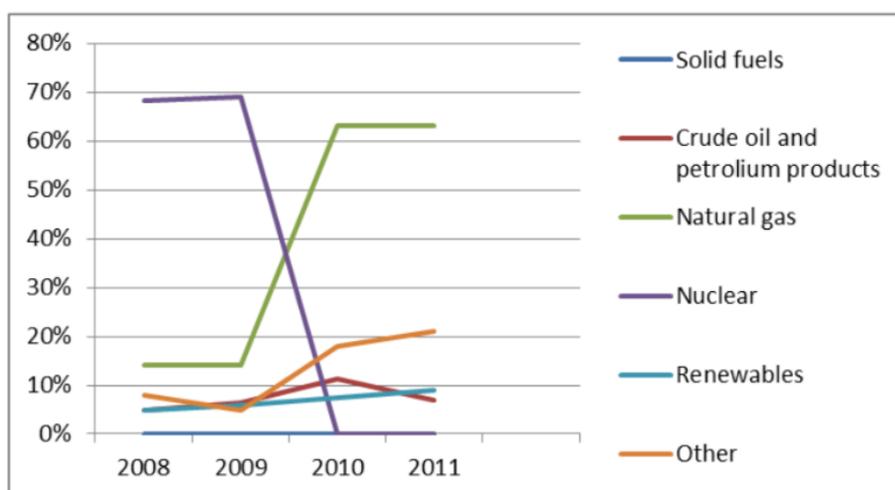


Figure 1 Gross electricity generation mix 2008 – 2011

Source: (European Commission 2015, 141)

After the Ignalina closure, Lithuania was highly dependent on Russia for energy imports. The result was a unified effort to break this Russian import dependency, by physically changing Lithuania's infrastructure away from Russia and towards the other EU Member States. Breaking dependency on Russia resulted in three important infrastructure projects that integrated the country regionally and globally: (1) In 2015, two large 400kV electricity transmission lines came online linking Sweden (NordBalt, 700 MW) and Poland (LitPol, 500MW) (European Commission 2015, 146); (2) In 2014, a floating LNG terminal (Floating Storage and Regasification Unit, FSRU) was stationed in Klaipeda to receive global shipments of gas; and (3) and biomass-based district heating will increase to 80% by 2020 (Ministry of Energy of the Republic of Lithuania 2017). Each of these projects displaces Russian gas and produces competition in electricity and gas prices.

The second project that resulted in diversification was the docking of the Independence (FSRU) in the Klaipeda harbor. The yearly capacity of the ship is 4 bcm and can provide 170,000 m³ of LNG storage. Financing for the LNG facility comes from all industrial and household consumers. The ship directly competes against Russia's pipeline gas in Lithuania and the region by shipping gas in smaller LNG ships and using storage capacity in Latvia. Each gas bill in Lithuania contains an LNG fee to pay for the facility.

The presence of the facility itself has driven down the cost of Russian gas. In 2014, Lithuania paid In 2014, Lithuania paid Gazprom 9.2 Euros per 1 MMBtu, before the LNG facility, in 2016, it paid 5 Euros per 1 MMBtu (Hinchey and Mikulska 2017).¹ This price drop coincided with a global price decline, nonetheless, before the facility, Lithuania was paying a higher price than its Baltic neighbors for Russian gas – representing Russia’s displeasure with the country’s energy independence strategy (Pakalkaite 2016, 15). The LNG terminal injected competition into the Baltic gas market, thereby lowering costs and increasing security of supply.

The third project was the development of biomass technology for district heating. After 1997, Lithuania began to shift away from using oil in district heating due to production and regulatory changes (implementation of EU market rules). In 1997, only 1.7% of Lithuania’s heat came from biomass; this is expected to increase towards 85% in 2020. The annual yearly savings from biomass are €200 million compared to gas to produce the equivalent amount heat (personal communication, Ramanauskas 2018). Nonetheless, biomass does experience price increases, with end-user heating costs increasing 4% between 2016 and 2017. This increase was due to a 25% increase in biomass fuel costs, nonetheless it still remains lower than the increase in gas prices (personal communication, Molis 2018).

The closure of the Ignalina nuclear power plant in exchange for EU membership is an *explicit expression of the physical realignment of Lithuania’s energy relations*. The following projects of electricity interconnectors, the docking of the FSRU Independence, and the growth of biomass for district heating are all physical representations of Lithuania’s turn away from a Soviet-era of dependence. This new infrastructure represents integration into a global and EU market structure. Lithuania is now set to develop its energy sector in a new direction, independent of Russian energy network connections. The future direction is discussed next.

¹ Euros per MMBtu are an approximation, converted from Euros per kg.

4.3 Reorientation towards the EU: Transformation of relations

The physical reorientation of Lithuania's energy system also included developing a new market structure with independent regulations and a competitive market structure. This transformation from a centralized, politically centered energy system began before full EU membership. Lithuania joined the EU in 2004, and even before membership, it was dramatically changing its energy system to meet EU requirements. For Lithuania to comply with the energy acquis (Chapter 14 on energy), it would need to adopt extensive legislation, establish a regulatory body and other institutional reforms, and implement measures to "enhance energy supply security, improvement of energy networks, efficiency improvements throughout the energy system and compliance with European environmental standards" (IAEA 2004, 1). This structural transformation would later allow it to enforce diversification efforts away from Russia and accomplish the above physical transformation of the energy system. The country is now set to embrace renewable technology to foster even more energy independence.

Lithuania's energy strategy approved in June 2018 envisions by 2050, 100% local electricity production, and 80% of energy needs met from non-polluting GHG sources, such as wind and solar. The short-term goal is to have an "energy-secure state" by 2020; the mid-term goal envisions *the lowest and most competitive energy prices* in the CEE and Scandinavian region by 2030 (built on RES), and the long-term 2050 goal of an independent energy state with 100% local energy production (The Republic of Lithuania Seimas 2018). With biomass firmly part of this plan and used for heating (and electricity production), new electricity lines, LNG, and RES projections, Lithuania has increased its security of supply and diversification. The new infrastructure marks a strong reorientation away from Russia and towards the EU and global markets for greater security and low GHG emissions. Adaptation to an EU compliant energy system also represents the adaptability within socio-political relations to transform the physical and political structures to reorientate towards another political-economic system, demonstrating *the*

broadly relationally transformative power of energy relations. The next section describes in more detail the socio-political realignment of technology and market structure to meet social demands.

4.4 The culture of low energy prices: Altering power relations

The change of both the physical infrastructure and internal energy market forced Lithuanian politicians to address both the social and economic relations of households and industry to the energy sector. That is, the use of new energy resources also raised questions regarding price and long-established social and business practices reliant on the Soviet-era cost structure. This section provides a brief overview of these challenges in the transformation of Lithuania's energy sector.

Changing the physical interconnections between Russia and Lithuania would also change the geopolitical power relation with Russia. Nonetheless, by this physical alteration, Lithuania intended to remove Russia's political-economic leverage by removing its ability to influence both the price and flow of electricity and gas. The questions were asked, "What costs are we willing to pay for our security" and what was the "most optimal way to pay for energy security" (personal communication, Lithuanian Energy Ministry Official A 2018). Therefore, reorientation held economic and political risks stemming from a more independent energy strategy that was physically diversified away from Russia, which delivered higher energy security but would also have a price attached to this security.

One solution was a national drive to develop a biomass market to gain energy independence and produce lower-priced heat. Thereby protecting or mitigating household consumers from gas price disruptions or increases. Diversification of heating resources also enabled diversification of electricity and gas import routes. Before building the LNG facility, Lithuania saw three risks for the country and consumers: 1) price of gas, 2) intention of Gazprom, and 3) need for gas by consumers. In response, Lithuania took steps to minimize these risks (personal communication, Molis 2018) by looking towards biomass as a new resource and technology.

The political and economic pressure of diversification fell on local mayors. They were under pressure to keep heating prices low and saw biomass as delivering lower-priced heat to citizens (and voters). Nonetheless, they were also under pressure from representatives of Gazprom to retain gas in local facilities (personal communication, Ramanauskas 2018). District heating relied on gas, but “nobody wanted to confront the monopoly” of the Russian supplier because high heating or electricity prices could be used against the elected officials in elections (personal communication, Lithuanian Energy Ministry Official B 2018). Nonetheless, local political and social resistance enabled the transition to biomass to occur. “There was strong resistance to Gazprom. [They] tried to influence the government and municipalities. But with a price that is a 300% price difference” higher than biomass (personal communication, Lapinskas 2018). Political support materialized to support the switch to biomass and reduce gas for district heating.

A national security perspective also developed, The Lithuanian Biomass Energy Association (Litbioma) saw this more than just developing their own business, as the head of the association stated, “I explained to (the scientists) this is not just science and business, they are ‘guarding the country’” (personal communication, Ramanauskas 2018). Both an energy security perspective developed as well as a geopolitical security interpretation that translated energy independence as anything but Gazprom. The switch to biomass also enabled Lithuania to develop a domestic biomass industry. Lithuania now exports biomass boilers to Italy, France, and Ukraine (personal communication, Molis 2018).

Underlining the political effort to switch resources and technology for heating, was a high price sensitivity by Lithuanian households. The price of energy, and in particular heat, appears to be very high for many households in Lithuania compared to income levels. [insert Figure 2 – chart of energy poverty] Figure 2, shows the swings in Lithuanian households that have trouble keeping their homes adequately warm in the winter. Around 30 percent of homes in 2016 struggled, with about 10 percent of

households behind on their utility bills. Looking back, the 2011 spike of gas generation, coincided with higher Russian imports and an increase in gas prices. In September 2010, Lithuania paid an estimated 30 EUR/MWh. By January 2012 this increased to above 40 EUR/MWh (Pakalkaite 2016, 15) with a strong increase in 2011. This price increase coincides with the difficulty experienced by homeowners in paying utility bills and keeping their homes adequately warm ([insert Figure 2 – chart of energy poverty]

Figure 2). Collectively, the price of electricity and heat impacted the lives of Lithuanians. The drive to use biomass reflects a political calculation that energy security and lower energy prices can be delivered over the long-term by diversification away from Russia. Political independence relied on energy independence.

[insert Figure 2 – chart of energy poverty]

Figure 2 Inability to keep homes warm and utility arrears

Source: (European Union Energy Poverty Observatory 2019)

During the Soviet era, Lithuanian consumers received subsidized low-priced gas, heat, and electricity. EU Membership required consumers to pay a market price. This requirement came from both the EU and Russia. Lithuania built infrastructure to the neighboring EU Member States and integrated into the global LNG trade, thereby altering its physical relationship with Russia. The physical reconstruction and the legal alteration of the country's energy market created a new opportunity to improve both security of supply and energy security for Lithuania. Nonetheless, physically diversifying away from Russia had to be weighed in terms of cost to consumers, and cost to politicians in maintaining their social support. The case of Lithuania demonstrates the *transformation of power relations are reliant on social support and the economics of technologies and resources along with the price to be paid for energy security.*

5 Discussion: The value of energy culture

The reorientation of Lithuania away from Russia and towards the EU reflects a geopolitical strategic move. The historical and geographical context informed the socio-political realignment into the EU's energy market. The contribution of this article is twofold: 1) Articulating how relational struggles create culture which influences the choice of energy resources and technologies, and 2) explaining the role of culture in the geopolitical orientation of an energy system. Four research questions guided a critical inquiry into the influence and role of energy culture in Lithuania. The result is a fuller understanding of who, why, how and what creates energy culture in the country. By answering these questions, it is possible to develop a deeper understanding of cultural processes within Lithuania's energy system.

Culture is central in understanding and explaining interactions in society, the economy, and politics. The broad nature of culture in this paper is corralled into a case study relevant to geography and Lithuania. The limitation of the article includes only using a geographic perspective, rather than drawing on other disciplines such as sociology or anthropology. Other limitations include the use of a single case study rather than a comparative study or a greater accounting of socio-cultural practices in communities. The focus on geopolitics also avoids important topics like energy justice (Pellegrini-Masini, Pirni, and Maran 2020; Jenkins et al. 2016; Heffron and McCauley 2017; Sovacool and Dworkin 2014) or national innovation systems (Freeman 1995; Lundvall and Edquist 1993) which also have national cultural elements. The largely top-down geopolitical perspective is more descriptive of the expression of culture in geopolitical energy relations between nation-states, rather than cultural struggles within and between local communities. An example of a local case study could be the use of the Russian language at the Ignalina nuclear power plant and in its city of Visaginas. This nuclear town

highlights the socio-political practices of Soviet and post-Soviet societies using Russian by former Soviet citizens who were brought to the city to build and operate the plant. Further use and exploration of energy cultures should embrace exploration in diverse spaces, scales and cultural contexts.

The objective of this article is to begin a critical assessment of energy culture, the final question, ‘What is Lithuania’s energy culture?’ provides a starting point. The first part of the answer is seen through the cultural geographic lens provided by Mitchell (2000) and the geopolitics of culture (Toal and Agnew 2002); with the second half answered at the end of this section. Three statements emerge from the literature review and which structured the examination of the Lithuanian case study. These three statements describe energy cultures:

- Energy cultures are broadly relationally transformative (relations)
- Energy cultures are a physical expression of relations (explicit)
- Energy cultures are socially and economically transformative and reliant on power relations (implicit).

These statements can also help us answer the three remaining research questions:

First, *energy cultures are broadly relationally transformative (relations)*. This statement draws from the social practices around energy. From the explicit development of energy culture to transforming the everyday lived experiences of self-organizing energy communities (Ruotsalainen et al. 2017) or the American driving culture (Sovacool 2009). Energy relations are transformative on both the physical space (explicit) and social spaces (implicit).

Answer the research questions in reverse order, aligns them with the three key statements. The third research question, ‘*How is Lithuania’s energy culture of geopolitics changed?*’, provides a relational perspective. Energy culture is created through social struggles containing “structures

of power, structures of dominance and subordination” (Mitchell 2000, XV). The outcome of these relational struggles, expressed in economic and social activities along with artifacts and resources, demonstrates the power to reconfigure spatial and scalar patterns in energy systems (Bridge et al. 2013, 331). The expression of power encapsulates geopolitical cultures (Toal and Agnew 2002), which alter how individuals and society secure energy, and display autonomy and authority (power) within and between nation-states.

The remaking of Lithuania’s physical energy system of networks of electricity and gas, nuclear power, LNG access, and use of biomass underscores how altering economic and social activities change the power relations. Lithuanian leaders created a new energy culture by making an explicit break from the Soviet-era infrastructure by building new infrastructure. They did this by connecting electricity and gas networks, building an LNG terminal, and by developing biomass technologies and resources. These efforts replaced and diversified gas sources away from Russia and enabled Lithuania to alter the physical dependence on Russian resources and technologies.

Lithuania created a new energy culture by changing the power dynamics through physically altering the materiality (such as resources, networks) of the energy system.

During the Soviet period, energy services were viewed as a right, not something to be paid for (Bouzarovski 2009). In Lithuania, a culture of resource and technology dependency was created.

New infrastructure was necessary to break this dependency and build a new energy culture aligned with EU efforts of increasing competition and transparency. The physical transformation of Lithuania’s energy culture occurred through infrastructure diversification. Nonetheless, citizens continue to hang onto the Soviet-era expectations of low energy prices, representing the cultural legacy of Communism.

Second, *energy cultures are a physical expression of relations (explicit) and are broadly relationally transformative (relations)*. This summary helps to answer the second research question, *'Why is energy culture in Lithuania changed?'* There are two parts that provide the broad conceptual understanding to answer the question. First, energy culture is created by, 1) The explicit control (dominance) of infrastructure, resources, and technologies; and, 2) The implicit socio-political reliance on economic and political benefits delivered from the materiality of an energy system. These are expressions of power relations.

Second, energy culture contains value by its ability to influence actions to create material wellbeing. Those creating or maintaining cultural influence can also control the energy system, and in turn, influence political, economic, and social relations. To understand 'why' culture is produced, Mitchell turns to the question of power (Mitchell 2000, xviii). Culture holds value and power.

Lithuania changed its energy culture to become independent of Russia. This shift is observed in Lithuania's fight to control and diversify the flow of resources. The growth in the biomass industry for both the production of biomass boilers and the use of biomass in district heating. The building of a new FSRU LNG facility. These efforts demonstrate the material and social value in controlling resources and technologies: which provide either dependence or independence.

The effort to foster independence is in the national security perspective that biomass held for scientists, "guarding the country" (personal communication, Ramanauskas 2018). This perspective demonstrates the physical expression and material value of resources going beyond a 'market price' and involving power relations. The support by local mayors for biomass indicates the socio-political context of energy prices. The underlining cultural dominance of low energy

prices (Soviet culture), rather than a market commodity with competition delivering low prices (EU culture). This difference highlights the implicit political value of energy resources and technologies. Energy culture exerts power for specific political-economic or geopolitical reasons. In the case of Lithuania, Russia sought to maintain an energy culture of gas dependency, thereby continuing the Soviet-era political influence through gas prices and gas networks. Lithuania changed the energy culture to be independent and reduce the power relations.

Third, *energy cultures are socially and economically transformative and reliant on power relations (implicit)*, provides an understanding of who is behind energy cultures. Or rather, helps to answer the third research question, ‘*Who creates an energy culture of geopolitics in Lithuania?*’ Lithuania demonstrates how the orientation of the country’s physical energy system influences the implicit larger power relation between Russia and the EU. The struggle over culture is a geopolitical struggle. An energy system is part of this larger tapestry of history representing political-economic relations and fights over spatial dominance (see Mackinder 2004). In short, *energy culture is the physical expression of relations*. It is why Russia builds, cajoles, and fights over delivery routes; it *exerts power* through its energy culture of low-priced resources and technology. The EU does likewise through neoliberal market access and competition (see Andersen, Goldthau, and Sitter 2017). A state, like Lithuania, needs to choose which culture it accepts.

An energy culture of geopolitics is created by those friends and enemies who utilize power relations drawing on a set of norms and values to bind members (Mitchell 2000, 72–73). By binding members through a set of practices, such as social expectations of low energy prices or networks of gas pipelines, spaces of dependence develop. The scales of actions, from the international to community level, demonstrate how a state spatializes world politics and

perceives, “certain defining dramas and dangers, friends and enemies” (Toal and Agnew 2002, 457). Cultural practices lend greater power to those controlling the resources and technologies who can deliver the resources to match expectations. Lithuania provides an example of three international actors, Russia, Lithuania, and the EU, working against and with each other to impose and develop a geopolitical cultural influence within the energy system.

The final research question is, ‘What is Lithuania’s energy culture?’ Lithuania’s energy culture *is based on energy relations that are transformative interactions, reflecting thermal or social interactions, expressing power, dominance, subordination, and valorization in a socio-political or political-economic context and displayed on the landscape*. More specifically, the Lithuanian case demonstrates the sources of resources, combustion technologies, and cultural relations express past and current (geopolitical) relations and the political, social, and economic orientation of the country, demonstrating deeper structural power relations influencing energy networks and markets. The Lithuanian case study shows how a long-term domestic socio-political agreement on prices can be sustained even after altering the physical composition and orientation of the energy system. More broadly, new technologies and international relations also alter both the energy system and energy culture. Lithuania demonstrates the production of energy culture is a continual process reliant on international and domestic power relations to foster technological change and network alterations.

6 Conclusion: A critical approach to reading energy cultures

The geographies of energy culture provide a conceptual framing to understand influences stemming from previous formative eras of nation-states. As Mitchell states, culture is not a ‘thing,’ but a struggle of social relations within and between structures of power, dominance, and subordination (Mitchell 2000, XV). Lithuania dramatically transformed the energy infrastructure within the country and through

international networks. The view from Lithuania was Russian resources and technology on one-side and the EU's market access and democratic institutions on another. The first represented dependency, while the second represented independence. Lithuania chose the energy resources, technologies, and networks that would deliver independence.

The narrow consideration of culture in Lithuania's energy relations leaves out larger cultural influences of the Soviet era on other eastern EU member states. The thirtieth anniversary of toppling the Berlin Wall was in 2019, EU membership of many of these countries is beyond 15 years. Still, the cultural legacy in the energy sector shapes the development of each country's energy system. The EU target of a net-zero economy by 2050 was blocked in January 2019 by Poland, Hungary, and the Czech Republic (Rankin 2019). Energy cultures provide an effective framing to understand how historical legacies shape current and future energy policies. However, developing a geopolitical interpretation of history, as Hepple points out, requires sensitivity to the context of the times when interpreting geopolitical change (1986). Energy cultures provide a means to frame and work with a range of theoretical and empirical concepts. The wide-pool of energy cultures literature demonstrates diversity in cultural interpretations and sites of social contestation. The struggle over energy cultures is relationally transformative. Further consideration should be given to how transformative it is for climate change and the ability to deliver a just energy transition.

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Appendix a

List of interviewees from organizations

category	Organization
	TSPMI / International relations insitute
Academic	- Vilnius university
Business	LNG terminal / Klaipėdos nafta
Business	ENERCON
Business	Enerstena
NGO	Lithuanian energy institute
NGO	InnoEnergy representative in Lithuania
Government	Visaginas municipality
Business	Ignalina nuclear power plant
NGO	Green energy centre
NGO	LVEA / Lithuanian wind association (director)
NGO	World Bioenergy Association (president)
Business	Litgrid
Business	Solitek
Business	Startup Lithuania
Government	Presidency of Lithuania
Business	Lietuvos Energija (Lithuanian Energy)
Government	Energy Ministry of Lithuania (x3 interviewees)

Business	4Energia
	Renewable energy confederation, President of the Lithuanian Confederation of Renewable Energy, the Director of the Lithuanian Energy
NGO	Advisers' Association
Business	Elinta
Business	Fortum Lietuva
Government	Advisor to the prime minister