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RISK COMMUNICATION AND RISK PERCEPTION: THE CASE OF NUCLEAR POWER PUBLIC DEBATE IN LITHUANIA

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Tiivistelmä – Abstract

The purpose of the present study is to investigate the risk communication of organizations and risk understanding, or risk perception, of the public at large.

The theoretical analysis generates the methodological model of risk communication and risk perception. This framework provides the ground for the empirical study focusing on nuclear power debate in Lithuania with the purpose of investigating the overall risk communication of Lithuanian organizations in relation to nuclear power issues, as well as citizens' perceptions about the technology.

The empirical investigation is based on a content analysis of qualitative data concerning risk communication of the target organizations, as well as secondary data analysis of a quantitative data set related to risk perceptions of the public.

The results show that the present study is consistent with other research claiming that risk communication should be guided by the risk perceptions of the public at large. Communication about risks should be a continuous dialogue between risk professionals and the public. Moreover, it should be based on the concerns of the target audience and tailored according to the needs of various public groups. While communicating about risks, organizations should also keep in mind the importance of mutual trust.

Asiasanat – Keywords
Risk, risk communication, risk perception, nuclear power, nuclear energy, nuclear power plant, Lithuania, Ignalina nuclear power plant

Säilytyspaikka – Depository
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1 INTRODUCTION

Contemporary society can be called a risk society (Beck 1992), as various risks and hazards are inevitably becoming an ascendant part of its everyday life (Lupton 1999; Slovic 1999; OECD 2003; Tulloch and Lupton 2003; Breakwell 2007; Palenchar and Heath 2007; Renn 2008). Although social strength and economic wellbeing is determined by society's willingness to accept risks (Gregory, Flynn and Slovic 1995, 6; Beck 2009, 4), there is a continuous questioning of the negative outcomes of modernity (Beck 1999; Beck 2009).

The development of various technologies with their associated risks and hazards leads to the increasing significance of risk communication (Breakwell 2000; Fahlbruch, Wilpert, Evans and Taylor 2006) with stakeholders and the public at large demanding more transparency and accountability from risk-initiating and risk-managing organizations. In order to respond to growing societal pressure, risk communication specialists are urged to attempt to understand the public and the way it comprehends risks (Coussens and Fischhoff 2001; Palenchar and Heath 2002; Renn 2008; Burns and Slovic 2012) in certain issue arenas (Jaeger, Renn, Rosa and Webler 2001; Luoma-aho and Vos 2009).

1.1 Purpose and aims of the study

The purpose of the present study is to investigate the risk communication of organizations and risk understanding, or risk perception, of the public at large, aiming to disclose the interrelationship of those domains, as well as to contribute to the risk communication of the organizations which deal with debatable technologies.

The purpose and aims shall be achieved through scrutiny of prior literature, and an empirical research. The theoretical analysis generates the methodological model of risk communication and risk perception, incorporating both organizational and societal levels. This framework provides the ground for the empirical study focusing on nuclear power debate in Lithuania with the purpose of investigating the overall risk communication of Lithuanian organizations in relation to nuclear power issues, as well as citizens' perceptions about the technology. It was decided to concentrate on nuclear technology because it is a highly relevant topic in current social, political and environmental agendas worldwide, with Lithuania being one of the states that ponders the future prospects of nuclear power.

1.2 Grounds for the study

The domains of risk communication and risk perception are extensively examined by researchers from various fields of study. However, there were no substantial studies known to the researcher that would focus on both the risk communication of organizations and the risk perceptions of the public in a certain issue arena. Therefore, there is still a clear need to investigate the risk perception of the public (Renn 2008; Burns and Slovic 2012) enabling an enhancement of "outside-in thinking" (Vos and Schoemaker 2006) of organizations which are related to nuclear power or other risks.

A better insight into the chosen fields should guide organizations in issue framing, risk assessment and management, and strategic communication planning and implementation, as well as collective decision making (Renn 2008). Hopefully, the findings of the present study will also add value to the society (Palenchar and Heath 2007).

1.3 Structure of the study

The present study is built around four major anchors: introduction, theoretical framework, empirical research and the discussion. After setting the stage for the study in the introductory part, the key concept of the thesis is conceptualized. The prior literature review on risk communication with its

intrinsic functions is presented in the following section. This is followed by the examination of previous research on risk perception and its levels. The theoretical framework of the study is concluded with the introduction of a methodological model of risk communication and risk perception that is constructed on the basis of the discussed theories.

The empirical study, its research questions and the methodology are presented in the third section of the thesis, while the forth section contains the review of the research results and their analysis. Finally, the main findings, an evaluation of the present study, as well as suggestions for future research are presented, before drawing a final conclusion.

2 THEORETICAL FRAMEWORK

The theoretical framework of the present study consists of the detailed overview of the prior literature concerning risk, risk communication as well as risk perception. This lays the ground for the methodological model of risk communication and risk perception presented in the final section of the theory part of the study.

2.1 Risk

Risk is the key concept of this study. The conceptualization of this term has changed through time. Currently, its meaning varies depending on discipline and approach, since risk is a complex phenomenon in nature (Slovic 1999; Althaus 2005; Breakwell 2007; Renn 2008; Zinn 2008). Therefore, the origin and changes in the meaning of risk are discussed. Furthermore, different ways of conceptualizing the phenomenon are examined in order to get a deeper insight into the matter. Finally, chosen positions in respect of risk research are delineated.

Risks are as old as modern society's development itself (Beck 1992, 21). The Concise Oxford English Dictionary traces the origin of the word back to the French *risque(r)* and Italian *risco*, *riscare* (1964, 1078). However, there is no clear consensus regarding the etymology of risk. Numerous scholars relate the emergence and dissemination of the concept of risk with early maritime ventures and insurance in pre-modern times (Luhmann 1993, 8–9; Giddens 1999, 21–22, 35). Then, according to Lupton (1999, 5), the word designated the possibility of a natural danger (e.g. storm, flood or epidemic) excluding human fault and responsibility.

Lupton (1999, 5–9) claims that the meaning and use of the concept of risk changed during modernity – the period between the middle of 15th century and the end of 20th. At the time of the Enlightenment and industrialization, the connotation of risk was extended, and the term denoted not only natural but also human-caused probabilities of danger (Ewald 1993, 226). Additionally, Lupton (1999, 7) argues that in modernity, the term risk incorporates the notion that risk-taking may be 'good' or 'bad'.

According to Zinn (2008, 4), currently at least three different but interrelated connotations of the term risk can be distinguished (see Figure 1). Commonly, risk is associated with hazard referring to anything that could lead to harm. Moreover, the concept is simultaneously used to express risk calculation. From a technical perspective, risk is related to the formalized assessment of probability and extent of a negative event. However, in less formalized perspective of everyday life, risk is often evaluated with the help of intuitive techniques. Finally, the concept of risk contains the notion of risk-taking as denoting the weighing of gains and losses. From this point of view, risk is not necessarily a negative issue. (ibid.) As Lupton and Tulloch (2002) argue, voluntary risk-taking might be pleasurable and beneficial in many ways.

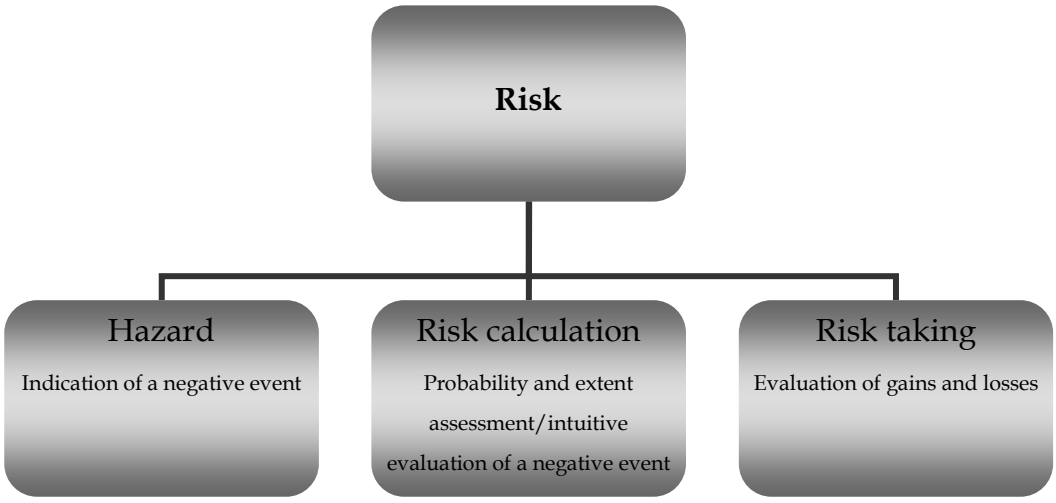

Figure 1 Three interrelated meanings of the concept risk (based on Zinn 2008, 4).

Differing connotations of risk that have changed over the centuries yield a great variety of definitions of the term. However, all of them share a common assumption that there is a distinction between possibility and reality or effects (Sjöberg et al. 2004, 7; Breakwell 2007, 1–2; Renn 2008, 1; Zinn 2008, 3). In terms of possibility, risk denotes the likelihood of a certain negative

activity or event while, in terms of reality, risk stands for the extent of damage associated with a detrimental activity or event (Breakwell 2007, 2). It is argued that reality is not predetermined or independent of human activities. It may be altered (or at least perceived as such) by making choices that either modify the initiating activity or event, or by mitigating the impacts (Renn 2008, 1; Zinn 2008, 4). Thus, "if the future were either predetermined or independent of today's human activities, the term 'risk' would make no sense" (Renn 2008, 1).

For the purpose of the present study, risk is determined as "the possibility that an undesirable state of reality (or adverse effects) may occur as a result of natural events or human activities" (Kates, Hohenemser and Kasperson 1985, 21 referred in Renn 2008, 1). According to Renn (2008 2, 12), the definition contains three essential elements:

- outcomes that are assessed or perceived on the basis of value system;
- possibility of occurrence (uncertainty);
- formula of combining these elements into a concept.

Perspectives to risk provide different conceptualizations of what are undesirable outcomes, and who determines what undesirable means. Furthermore, perspectives differently specify, qualify or quantify the possibilities of undesirable outcomes, and combine them into a common concept allowing comparison, prioritizing and effective risk governance. (Renn 2008, 12.)

In current literature, perspectives to risk are commonly categorized on the grounds of two dimensions concerning the foundations of knowledge or ontology and the base unit of the analysis or particularity (Taylor-Gooby and Zinn 2006, 407; Renn 2008, 23). At the former level, approaches to risk vary according to the extent to which risks are assumed as real entities beyond their social context, or as socially-constructed phenomenon. At the level of particularity, risk theories carry different implications about individualism, where the bearers of risk perceptions are seen as discrete individual people, or collectivism, where they are regarded as irreplaceably social entities, such as institutions, social groups, subcultures or societies. (Strydom 2002, 46; Taylor-Gooby and Zinn 2006, 407; Renn 2008, 23–24; Zinn 2008, 4.)

In order to disclose different ways of conceptualizing risk, main theoretical perspectives to risk are overviewed on a more general level in this subsection[1]. Table 1 serves as a frame arranging different approaches on the continuum of realism-constructionism and providing a general orientation and distinction between risk approaches. Nevertheless, it is notable that some theories on risk may have features of more than one perspective. Therefore, the scheme provides just a simplified picture of overall risk research.

Epistemological position	Risk is…	Perspectives and theories
Technical-scientific approaches		
Realism	real and objectively calculated	Techno-scientific, rational choice, cognitive/learning, mental modelling; psychometric paradigm
Sociocultural approaches		
Weak constructionism	real but socially mediated or constructed	Cultural/symbolic; risk society, risk civilization
Social constructionist approaches		
Strong constructionism	subjective and socially constructed	Governmentality

Table 1 Summary of major theoretical approaches to risk (based on Lupton 1999; Strydom 2002, 47; Taylor-Gooby and Zinn 2006; Renn 2008, 24).

Technical-scientific approaches are considered as realist perspectives (Lupton 1999, 17; Zinn 2008, 5; Frandsen 2009) where risk is considered as an objectively observable or measurable real event or danger (Lupton 1999, 17; Renn 2008, 13; Zinn 2008, 4–5). Risk assessment and management is based on experts' empirical calculations of the probability of risk occurrence and the amount of damage (Lupton 1999, 18; Taylor-Gooby and Zinn 2006, 407) excluding subjective and social factors (Renn 2008, 17). Although it is commonly admitted that "subjectiveness" is inevitable in human judgement, risk calculations tend to be treated as "objective facts" or "absolute truths" in technical-scientific perspectives (Bradbury 1989, 382). The limits of calculability interpreted as lack of knowledge may be overcome by further research, as well as the construction of models and scenarios providing an orientation on how to act rationally in uncertain future situations (Lupton 1999, 18; Renn 2008, 13–14; Zinn 2008, 5).

[1] For other attempts to classify the theoretical directions of risk see Lupton 1999, 17–35; Strydom 2002, 36–52; Zinn and Taylor-Gooby 2006; Renn 2008, 12–45.

Sociocultural theories are ascribed to weak constructionist approaches that regard risk as real hazard, threat or danger (Lupton 1999, 24; Frandsen 2009). However, in contrast to the technical-scientific point of view, socioculturalists discard probability calculations (Renn 2008, 22) and emphasize the significance of social and cultural contexts in which risk is understood, mediated or socially constructed and responded to by individuals, groups and cultures (Lupton 1999, 24, 35; Zinn 2008, 6–7). Sociocultural approaches share the idea that an understanding of risk is developed via membership of cultures and through personal experience (Tulloch and Lupton 2003). Therefore, they seek to explain risk on the basis of cultural aspects and, in some cases, social and demographic factors (Taylor-Gooby and Zinn 2006, 407; Renn 2008, 23). Special attention is paid to social changes on an individual and institutional level and the way in which these changes shape both the understanding of risk and uncertainty, as well as social actors' awareness of themselves and their behaviour in relation to risk (Taylor-Gooby and Zinn 2006, 407). Moreover, Lupton (1999, 25) argues that the notions of choice, responsibility and blame are widely associated with risk in sociocultural perspectives.

Social constructionist theories are assigned to strong constructionist approaches that see risk as a dynamic phenomenon which is constantly constructed and negotiated through social interaction and the formation of meaning (Lupton 1999, 29). Thus, risk is never completely objective or separable from social and cultural contexts, since it is brought into being and managed as part of social processes (Lupton 1999, 28–33; Zinn 2008, 6–7). From the social constructionism perspective, anything may be defined as a risk (Lupton 1999, 31), since risk debates may occur and cease without any relation to the "real" world (Zinn 2008, 6). Nevertheless, Lupton (1999, 29) highlights that risks are always constituted via pre-existing knowledge and discourse. That is why the representatives of social constructionist approaches believe that public concerns may be explained only by social and cultural factors, while striving to disclose who and how constructed certain risks in specialized texts or in public arenas are (Lupton 1999, 30–31; Zinn 2008, 7).

Previously presented approaches to risk can be best summed up by Althaus (2005, 581) who states that "risk is a strange mix of seeming contradictions. It is both calculable and indeterminate, objective and subjective, visible and invisible, knowable and unknowable, predictable and unpredictable, individual and collective."

2.2 Risk communication

Risk communication is understood as the exchanges of information among individuals, social groups and organizations regarding risks to health, safety and environment (Breakwell 2000, 110–111; OECD 2002, 15). According to Palenchar (2005, 752–753), the means of risk communication provide the opportunity to take into account the risk-related concerns of involved parties, engage in dialogue, carry out appropriate actions enabling to reduce perceived risks and encourage public participation as well as enhance mutual understanding. Risk communication efforts are claimed to be important in all the stages of risk-handling processes, starting from the framing of an issue to the monitoring of risk management impacts (Amendola 2001; OECD 2002, 16; Renn 2008, 202).

Renn (2008, 202–203) pinpoints two major tasks of risk communication. Firstly, it has to ensure an internal risk communication or the exchange of information among those who are central to risk assessment and management. Previously underestimated cooperation among scientists and other experts as well as policy-makers is currently understood as a significant prerequisite for efficient risk governance. Secondly, risk communication has to deal with external risk communication tasks or communication about risks to the external stakeholders. (ibid.) External risk communication is the focus of the present study.

Institutionalization of risk governance has led to the stronger role of risk professionals undermining the public's contribution to the field (Renn 2008, 203–204). Nevertheless, recent literature encourages taking more into consideration the target audience while planning, implementing and evaluating risk communication (Palenchar and Heath 2007). In risk management processes, communication about risks does not mean the dissemination of information or persuasion ineffectively practised during the early days of risk communication (Fischhoff 1998, 134; Palenchar and Heath 2007, 127; Renn 2008, 201–202). As Breakwell (2007, 172) denotes, "there has been a move from seeing the public as target for influence to recognising them as partners in the process of risk management."

Dialogue or two-way communication where not only the members of the public but also risk professionals engage in mutual information exchange is highly recommended in recent studies (OECD 2002; Breakwell 2007, 131; Renn 2008, 203–204, 274; Venables, Pidgeon, Simmons, Henwood and Parkhill 2009, 1102). It is significant to hear and learn from stakeholders and the public at large about their awareness and need for information. In social arena of risk, a communicator should not decide what people have to know but rather respond to the questions of what people are eager to know (Renn 2008, 203–204).

From an organizational perspective, risk communication may be seen as a more or less purposeful sharing of risk-related information. According to Heath (2006, 100), risk communication has to:

> "*Demonstrate the characteristics that foster legitimacy, such as being reflexive; being willing to consider and instrumentally advance others' interests; being collaborative in decision making; being proactive and responsive to others' communication and opinion needs; and working to meet or exceed the requirements of relationship management, including being a good corporate citizen.*"

This suggests the following major functions of risk communication:

- informative and educative function;
- the function of involvement and participation in risk-related decision making;
- the function of mutual trust and confidence building. (Morgan et al. 1992; OECD 2002; Palenchar and Haeth 2007; Renn 2008, 203, 207.)

Successful fulfilment of closely interrelated risk communication functions adds value to society (Palenchar and Heath 2007), as well as to organizations themselves.

The implementation of risk communication is not an easy task (Gregory et al. 1995, 7; Breakwell 2007, 130; Palenchar and Heath 2007, 127) especially when it is related to modernization or technological risks (e.g. radiation). Beck (1992, 23, 28) argues that such risks are difficult to perceive, frame in time and space dimensions, anticipate, and recognize their cause and effect. Therefore, they tend to be particularly open to social definition and construction. Modernization risks are amplified or attenuated depending on the speaker in a social arena (Kasperson, Jhaveri and Kasperson 2000). According to some research, the effectiveness of risk communication relies on a complex interaction between the audience, the source of the message,

and its content (Breakwell 2000, 113–117; Breakwell 2007, 132–133; Palenchar and Heath 2007).

In successive subsections, risk communication is further scrutinized on the basis of its functions as well as the aspects contributing to the effective communication about risks.

2.2.1 Informing and educating the public

One of the major functions of risk communication is to provide the public with fair, accurate and appropriate factual information about risks, and aid people in understanding, informed decision-making as well as risk handling. Risk communication efforts may also serve as a means to induce positive behavioural intentions. (Morgan et al. 1992; OECD 2002; Renn 2008, 203, 207.)

Informing and educating the public is mostly in the hands of organizations – the major sources of risk-related information. More than ever before, current society has to count on them and their information (Beck 1992; OECD 2002, 50; Renn 2008). However, organizations have significant power in issue framing, or in the way of conceptualizing certain issues in negotiation (Fairman, Chigas, McClintock and Drager 2012, 13). Issue framing is important for organizations, as it enables them to pinpoint relevant issues, impact the course of negotiation and resulting agreements, as well as gain the support of powerful stakeholders (ibid.: 14–15). Risley (2011) argues that efficient issue framing does increase organizations' chances of participating in the agenda-setting and formulation of policy-making.

As risk communication is inseparable from the characteristics of an organization (Palenchar and Heath 2007, 126), those with the power to communicate tend to choose the side of an issue as well as the way of addressing it according to their designated function in order to provide suitable arguments supporting their performance and existence (Perrow 1984; Dietz and Rycroft 1987, 54 referred in Renn 2008, 217; Rayner 1992; Slovic 1999; Fairman et al. 2012, 13). Nevertheless, prior literature highlights that organizations must "walk in the shoes" of their counterparts and rivals, as well as the public at large, holding certain values, worldviews, interests and understandings of negotiated issues (Lundgren and McMakin 2009, 44; Fairman et al. 2012, 15).

An organization can rise in power when its narratives or ideas of a certain issue are accepted in the debate of the marketplace of messages (Heath 1994). Breakwell (2007, 133) argues that the message of an information source is received by an audience depending on the attractiveness, status and trustworthiness of the information source. According to the scholar (ibid.), the more appealing the source of the message is in respect to its norms, trustfulness and powerfulness in terms of its status or expertise, the more persuasive its messages are.

The effectiveness of informing and educating the public depends on the content of the message disseminated by the information source. According to the information processing paradigm, the message has to trigger the attention of the targeted audience and achieve comprehension, in order to impact understanding and risk-related decision-making (Breakwell 2000, 116). The design features of a message (e.g. font size, icons, location), its structure (e.g. provided information order) as well as content (e.g. variety of opinions presented, simplicity, repetition, fear) were delineated as the most significant aspects of risk communication messages that help to increase the likelihood of getting an audience's attention and impact on the comprehension of the message (Breakwell 2000, 116; Breakwell 2007, 132). Risk communication messages should be designed so that they correspond with an audience's needs, concerns, and level of knowledge (OECD 2002, 35; Fahlbruch, Wilpert, Evans, Taylor 2006, 27). Moreover, Breakwell (2007, 156) highlights that it is also important to take into account public values and affective aspects.

The effectiveness of informing and educating the public about risks is claimed to contribute to better public awareness and knowledge, helping to correct their misconceptions and attitudes, strengthen 'right' beliefs and diminish peripheral ones, as well as induce positive behavioural intentions (Palenchar and Heath 2007, 123). Renn (2008, 203) pinpoints risk communication as preparing people to face and cope with risks in risk situations. Finally, better risk awareness encourages people's involvement and participation in risk-related decision-making, as well as contributes to higher trust in involved organizations (Amendola 2001).

2.2.2 Public involvement and participation

As the nature of risk requires the collaboration of and coordination between involved parties (Renn 2008, 9), risk communication efforts are supposed to provide stakeholders and the public at large an opportunity to participate in risk governance and express their concerns, interests and values (Palenchar and Heath 2007, 124–125; Renn 2008, 203). The OECD (2002, 43) delineates three major goals for stakeholder involvement that are as follows:

- reducing complexity
- dealing with uncertainty
- coping with ambiguity.

Dealing with risk issues often leads to the emergence of social conflict. Therefore, it is argued that cooperation between involved parties should start as early as risk-framing activities are being launched, and continue throughout the whole risk governance process. (Gregory et al. 1995; Amendola 2001; OECD 2002, 43; Fahlbruch et al. 2006, 5; Renn 2008, 279.)

Governments' legislations have been constantly changing towards more cooperative (or at least transparent) risk governance policies. However, quite often risk-related decisions are seen as unsatisfactory by the public who have certain concerns, interests and values that risk professionals have not taken into consideration (Amendola 2001). In order to avoid any public outcry, risk-related organizations are advised to involve the relevant parties of the public at large, who may offer valuable input into assessing risks and related uncertainties as well as possible approaches to risks, enabling an evaluation of their impacts on various targets (Gregory et al. 1995, 7; OECD 2002, 29; Renn 2008, 281).

In terms of public involvement and participation, risk communication should provide equal and fair opportunities for all relevant parties to voice their opinions and preferences, knowledge and expertise, interest and value, ethical principles and legal norms (Renn 2008, 275–276). Therefore, participation processes should be designed so that various actors are encouraged to contribute to risk governance processes in those areas in which they have some competence or ideas (OECD 2002, 29; Renn 2008, 276). According to Renn (2008, 277–279), the higher the degree of risk-related complexity, controversy, ambiguity and uncertainty, the more an inclusive strategy of participation is needed.

Collaborative exchanges of risk-related messages can take different forms. For instance, forums, roundtables, public hearings, citizen panels or juries, committees and other public involvement and participation methods were pinpointed in resent literature (Rowe and Frewer 2000; Renn 2008, 277). Since all of the methods have both pros and cons, Rowe and Frewer (2000) suggest to combine some of them by choosing their best elements or to employ certain packages of possible approaches.

Breakwell (2007, 172) argues that public involvement and participation has become something like an eagerly pursued holy grail that is a highly preferred but very demanding tool of risk communication and risk governance. According to Renn (2008, 284), risk-related decision making is difficult, since it has to address complex cause-effect relationships, trade-offs between benefits and damages, the distribution of potential benefits and risks among different regions, times or social groups, and deep-rooted values or desirable lifestyles. Therefore, the more actors, viewpoints, interests and values that have to be taken into consideration, the more problematic it is to reach a consensus or commonly acceptable agreement (ibid.: 275).

Although public involvement and participation require a great deal of effort, collaborative seeking of risk-related solutions is worth the attempt. Efficient cooperation with the public contributes to better awareness and understanding of risks (Renn 2008, 276). As the Chinese proverb goes, 'Tell me, I will forget; show me and I may remember; involve me and I will understand'. A better comprehension of risks paves the way to the public's approval and acceptance. Furthermore, properly managed joint engagements in risk governance processes boost peoples' trust and confidence in institutions, and they are perceived as effective, efficient, accountable, fair, transparent, and ethically acceptable (Palenchar and Heath 2007; Renn 2008, 275). Nevertheless, Renn (2008, 276) stresses that the potential benefits of successfully implemented risk communication depend upon the quality of the participation process. "If done improperly, it may actually increase overall risk level, lead to inefficiencies, destabilize existing power distributions, and make ignorance and incompetence the guiding principles for decision-making" (ibid.: 283).

2.2.3 Building mutual trust and confidence

The complex nature of risk demands trustworthy relationships between involved parties (OECD 2002, 50) that may be built with the help of risk communication efforts, enabling an enhanced trust and confidence between involved parties through transparent communication about risk management and organization's ability to handle risks effectively, efficiently and fairly (Heath and Pelanchar 2000; Renn 2008, 203). Trust is thus the invisible outcome of a successful communication on concerning issues, as well as matching actions (Heath and Pelanchar 2000; OECD 2002, 51; Renn 2008).

In risk debate, issues of trust revolve around risk-related organizations that are always urged to get their license to operate, or legitimacy, with the smallest mistake being sufficient to destroy fragile trust (OECD 2002, 50; Renn 2008, 228). Numerous scholars denote that the greatest challenge of current organizations that are dealing with risk-related issues is a pervading lack of trust in them and their operations (Beck 1992; 1999; Luoma-aho 2005; Pelanchar and Heath 2007). Failed corporate responsibility efforts as well as exhibited control of risks are some of the reasons behind distrustful attitudes towards them (Beck 1992; Renn 2008). According to the OECD (2002, 51), there is only one general rule for building trust: listening to peoples' concerns and taking part in two-way communication with the public. Information alone is not enough for building or sustaining trustworthy relations. Trust cannot flourish if there is no systematic feedback and dialogue between involved parties. (ibid.)

Trust in risk-initiating and managing organizations, as major sources of risk-related information, is one of the key elements triggering risk responses publically, especially when individuals lack personal knowledge about a certain risk (OECD 2002, 50; Breakwell 2007, 140–141; Renn 2008, 129, 228). Gaining and establishing trust is a demanding task for risk initiating and managing organizations, since it comes with the experience of trustworthiness an organization has created among its stakeholders (OECD 2002, 51; Renn 2008, 223). Heath and Pelanchar (2000) argue that continuous information about organizations' efforts to improve safety and reduce risks encourages the public to feel a greater sense of control that enhances trust and confidence in the source.

As Breakwell (2007, 144) claims, trust is as fragile as a flower: it is hard to build and maintain but very easy to lose, since individuals are more affected by negative issues than positive ones. If people believe that the organization is silent because it is hiding something or a certain risk is not being appropriately handled, there is a high possibility that they will become politically active (OECD 2002, 50; Fahlbruch et al. 2006, 3). More than ever before, people have access to information and are able to voice their opinions and issues through various real-time media channels and in no time spread messages attracting the public's attention and impacting risk comprehension (Breakwell 2007, 165). Current technologies also enable people to form international interactive groups that may have enormous power to influence risk perceptions and reactions. This poses a great challenge for risk-initiating and managing organizations that have to be constantly alert in such a turbulent environment.

Building mutual trust and confidence relies on trustworthy messages (as well as according actions) that should be planned and communicated on the basis of seven interrelated components of trust (see Table 2): objectivity, fairness, transparency, good intentions, competence, consistency and empathy (OECD 2002, 51; Renn 2008, 124). Distrust may arise when individuals' expectations of these trust dimensions are violated (ibid.). Thus, in risk communication, not the quantity but the quality of provided information matters. In other words, more communication does not necessarily enhance trust and credibility (Gower 2006).

Component	Description
Perceived competence	Degree of technical expertise in meeting institutional mandate
Objectivity	Lack of biases in information and performance as perceived by others
Fairness	Acknowledgement and adequate representation of all relevant points of view
Consistency	Predictability of arguments and behaviour based on past experience and previous communication efforts
Sincerity	Honesty and openness
Faith	Perception of "good will" in performance and communication
Empathy	Ability to understand the feelings and expectations of others and to be responsive to them

Table 2 Components of trust (OECD 2002, 51; Renn 2008, 124).

The more people rely on an organization, the more positive they are about it and the related risks (OECD 2002, 50; Renn 2008, 228). This also contributes to a perceived legitimacy guaranteeing effective functioning of the organization and a favourable operating environment.

2.3 Risk perception

In cognitive psychology, the term 'perception' refers to the continuous mental processes by which individuals interpret and arrange sensory information[2] in order to give meaning to their environment (Lindsay and Norman 1977; Robbins 2000, 23). As risk refers to the possibility that adverse effects may occur as a result of natural events or human actions (Kates, Hohenemser and Kasperson 1985, 21 referred in Renn 2008, 1), risk perception can thus be defined as the subjective processing of sensory experiences and/or information about a potentially dangerous event or activity, and the evaluation of its seriousness, probability and acceptability (Sjöberg, Moen and Rundmo 2004, 8; Renn 2008, 98). Renn (2008, 93) believes that risk perception is the most significant drive for human behaviour, since facts tend to play a marginal role for people in risk evaluation process.

Risk perception as an inherently subjective assessment of uncertainties is internalized through social and cultural learning and is continuously modified by peers, media and other communication processes (Tulloch and Lupton 2003, 8; Renn 2008, 98). It is based on common sense reasoning, experience, emotion, as well as worldviews, ideologies and values that are impacted by a variety of psychological, social, cultural, governmental and political aspects (Fischhoff, Slovic, Lichtenstein, Read and Combs 1978; Slovic 1999; Slovic, Finucane, Peters and MacGregor 2004; Sjöberg 2000; 2002; Sjöberg et al. 2004; Renn 2008).

Subjective risk evaluations are rational if seen in the light of the context. They commonly follow the logical patterns of risk perception that have evolved while coping with dangerous situations (Slovic 1999). With the lapse of time, basic patterns of constructing images of risks were enriched with cultural patterns going beyond probability and harm evaluation – the two classical factors of risk judgement (Renn 2008, 93–94). Therefore, the attributes of risks are not universal, but case or context dependent (Sjöberg et al. 2004, 17; Slovic 1999, 691–692). It is argued that risk perceptions tend to form certain patterns which are shaped by social as well as cultural norms (Tulloch and Lupton 2003, 8).

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[2] Sensory information means the relatively unprocessed information gained through the five senses: sight, hearing, touch, smell and taste (Lindsay and Norman 1977).

There is no consensus of opinion on how to treat risk perceptions of the general public in risk assessment and management processes, since different stakeholder groups conceptualize risk contradictorily. On the one hand, it is assumed that risk perceptions have no scientific ground and are based on subjective sensual and emotional evaluation, and have no substantial weight. However, the experiences of risk are a part of contextual aspects that have to be taken into consideration while assessing, negotiating and managing risks. (Renn 2008, 96–97.) Renn (ibid.) argues that both positions should be equally legitimate in risk governance.

The psychometric perspective that is regarded as one of the technical-scientific approaches was constructed with the purpose to explain peoples' risk perceptions. Psychometric research methods provide an empirically based explanation of factors or contextual attributes, impacting risk experience and behaviour. Those qualitative perception patterns are:

- risk-related patterns grounded on the properties of the source of risk, and
- situation-related patterns based on the characteristics of the situation in which the risk manifests itself (Fischhoff et al. 1978; Sjöberg 2002, 379–380; Renn 2008, 93–94, 107–108).

A set of psychometric factors that were mentioned in the research on the subject is presented in Table 3.

Perception pattern	Characteristic	Explanation
Risk-related characteristics		
Evaluation of a risk	Newness	Is a risk new?
	Familiarity	To what extent is a risk known to a person?
	Likelihood	How likely is a risk?
	Commonness vs. dread	Is a risk so usual that people have learned to live with it, or does it raise fear?
	Potential for catastrophic consequences	Does a risk affect people one at a time (chronic) or large number of people at once (catastrophic)?
	Immediacy of consequences	How immediate is the effect of a risk?
	Severity of consequences	How fatal are consequences of a risk?
Situation related characteristics		
Evaluation of a situation	Voluntariness	Does a person face the risk voluntarily?
	Control	To what extent it is possible to avoid the risk by using personal skills and abilities?
	Distribution of risks and benefits	Are risks and benefits equally distributed?
	Trust	Can risk-related organizations be trusted in risk management?

Table 3 The main qualitative attributes of risk and risky situations (Fischhoff et al. 1978; Slovic, Flynn and Layman 1991; Slovic, Layman and Flynn 1991).

Although the Psychometric Paradigm was met with enthusiasm and has been applied in numerous multidisciplinary studies, the credibility of this perspective is still questioned (see Marris, Langford and O'Riordan 1998; Sjöberg 2000; 2002; Sjöberg, Moen and Rundmo 2004). Traditional studies on risk perception have been confined to the core characteristics of a risk, forgetting the relationship between the risk or technology and its context (Sjöberg 2002, 382; Zinn 2008, 6). Renn and Rohrmann (2000 referred in Renn 2008, 141–145) propose an integrative model of risk perception that seeks to overcome this problem by incorporating psychological, social and cultural aspects influencing individual and social risk perceptions.

The framework, illustrated in Figure 2, constitutes of four contextual levels:

1. heuristics of information processing;
2. cognitive-effective factors;
3. socio-political institutions;
4. cultural background. (Renn 2008, 141.)

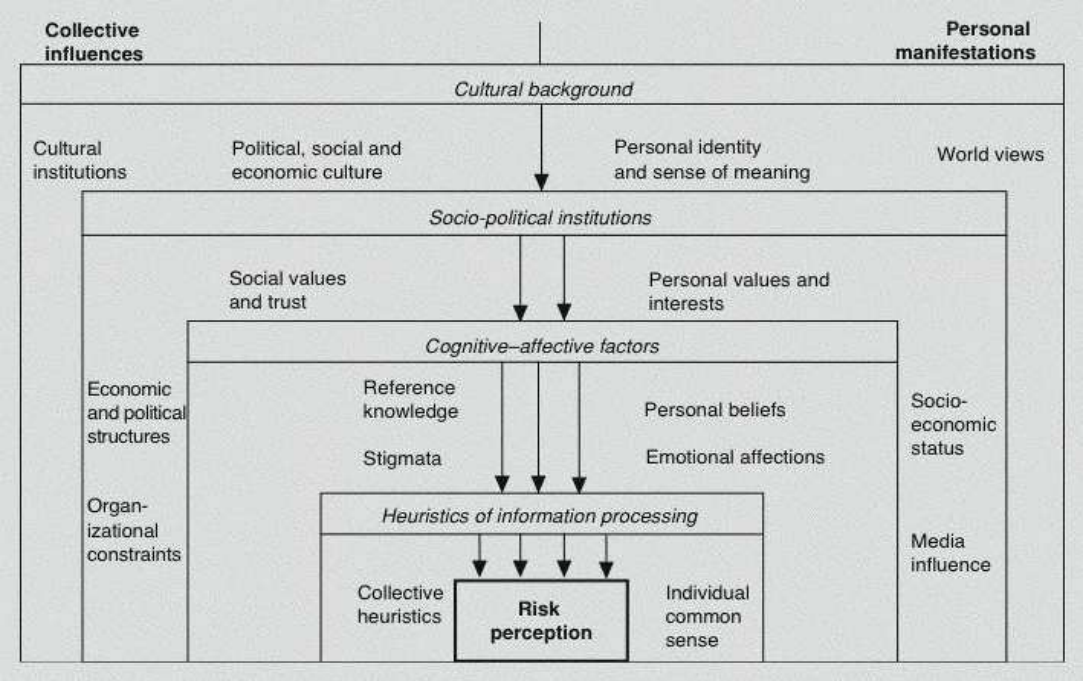

Figure 2 Context levels of risk perception (Renn and Rohrmann 2000 adapted in Renn 2008, 141).

The first two levels of the integrative model of risk perception focus on the psychological perspectives of risk experience providing a better

understanding of how people process information, attribute contextual factors and emotions to different types and situations of risk, and form certain conclusions. Social and cultural dimensions, covered in the last two levels of the model, partially affect psychological risk characterization, and partially impact the formation of risk perceptions directly. A deeper insight into social and cultural dimensions thus provides a more specific knowledge of certain social and cultural stimuli, raising particular risk characterizations and reactions. Furthermore, the levels of the model have two dimensions: individual and collective expressions of risk perceptions. Each contextual level is incorporated into the following higher level in order to indicate the interdependence of psychological, social and cultural factors of risk perception. (Renn 2008, 99–148.)

Each contextual level of the integrative model of risk perception will be discussed in more detail in successive subsections.

2.3.1 Heuristics of information processing

The first level of the integrative model of risk perception focuses on collective and individual heuristics which individuals employ while evaluating risks. In psychology, heuristic stands for the mental procedures applied in a search for decisions or problem solutions. They are commonly based on analogies between the problem at stake, and already known or experienced effective ways out of a complicated situation (Lindsay and Norman 1977, 555). In other words, heuristics are rules of thumb, intuitive judgments or common-sense reasoning that was learned through biological and cultural evolution (Lindsay and Norman 1977, 555; Renn 2008, 142).

Heuristics are applied in many everyday circumstances. Commonly, they are effective and efficient ways of making decisions and solving problems; however, sometimes they can lead to systematic errors or cognitive biases (Lindsay and Norman 1977, 555). According to Renn (2008, 142), heuristics are also used as the primary mechanisms of selecting, memorizing and processing signals from the environment, enabling a pre-shaping of judgements about the seriousness of the risk in question. Thus, heuristics is a primary level of risk perception formation.

2.3.2 Cognitive and affective factors

On the second level of the integrative model of risk perception, Renn and Rohrmann (referred in Renn 2008, 142–143) place cognitive and affective, or emotional, factors. Recent literature on risk perception shows that individuals' reactions and behaviours are determined by the interplay between cognitive evaluations and emotional responses (Slovic 1999; Loewenstein, Hsee, Weber and Welch 2001; Zwick and Renn 2002; Renn 2008).

Loewenstein et al. (2001, 280) claims that people evaluate risks at a cognitive level, largely on the basis of probability and desirability of potential consequences. In contrast to cognitive evaluation, emotional reactions depend on the vividness of associated imagery, proximity in time and other factors that have a minor impact to cognitive information processing (ibid.). Fear, disgust and anger may be ascribed to one end of the risk-related spectrum of emotions, while admiration, identification and immediacy belong to the other end (Renn 2008, 108). According to Slovic (1999, 694), emotions serve as orienting mechanisms that control such essential psychological actions as attention, memory and information processing, and guide individuals in judging risks and uncertainties. Affective evaluation is considered to be especially relevant when people have to make a hard compromise or interpret ambiguous information. In such situations, individuals commonly focus on the strongest affective feelings and draw conclusions. (Renn 2008, 96.)

Risk perceptions lay the ground for stigmatization (Gregory et al. 1995) that denotes negative emotions and feelings elicited by risk aversion, despite the cognitive content of the risk information (Renn 2008, 108). It is an outcome of the social amplification of the risk that tends to raise negative images and emotional reactions, leading to avoidance behaviour and the attendant stigmatization of products, places or technologies (Gregory et al. 1995, 4; Kasperson, Jhaveri and Kasperson 2000, 9–10).

2.3.3 Social and political institutions

Social and political institutions, which are associated with the cause of risk or the risk itself, are on the third level of the integrative model of risk

perception. The network of risk-related authorities constituting of, for instance, science communities, governmental authorities, private organizations and interest groups as well as media shape individual and collective experiences of risk (Renn 2008, 143).

Currently, the majority of risks that society faces are not directly experienced but learned from information provided by risk-related organizations. Personal control has also shifted to institutional risk management. (Renn 2008, 123). Therefore, more than ever before people have to count on the credibility and sincerity of risk-generating and risk-managing organizations (Beck 1992; OECD 2002; Renn 2008). It is not a secret that they tend to select and frame risk-related information as well as amplify and attenuate different aspects of certain issues in a way that legitimizes their existence and performance (Beck 1992; Breakwell 2007). Varying perspectives on risks usually generate contradicting messages that intrigue the media but confuse the public.

In such a seemingly chaotic pool of varying information about risks, institutional trust plays a very significant role in shaping individual and social risk perceptions (Renn 2008, 124). Trust in risk-related organizations may compensate for negative risk perceptions, whereas distrust encourages opposition of even small risks (OECD 2002, 50; Renn 2008, 228). People investing a large amount of trust in certain organizations rely on their ability to assess and manage risks, and it can take many disappointments before they decide to withdraw this investment (Renn 2008, 125).

Media, as an intermediary source of risk-related information, stimulates peoples' risk perceptions. As Golding (1994, 463–464) puts it, "they are a major source of the imagery, values and ideas with which we make sense of the world around us." Journalists collect information from primary sources, process and frame it according to personal preferences, professional and institutional rules, and the expectations of perceived target audiences (Renn 2008, 127). Society's watchdogs are interested, among others, in technological hazards, dramas and conflicts, uncertain and controversial opinions, as well as the possibility of blaming someone (ibid.: 125). Sjöberg et al. (2004, 21) argues that there is no data indicating strong relations between perceived risk and amount of media coverage. However, Renn (2008, 129) believes that media coverage becomes more relevant and influential, the more individuals lack personal experience and knowledge.

2.3.4 Cultural background

On the forth level Renn and Rohrmann (referred in Renn 2008, 142–143) place cultural factors that are believed to be powerful determinants of perceived risks. Numerous researches have been conducted on cross-cultural comparison of risk perception (for an overview of such research see Sjöberg et al. 2004), finding that individuals conceptualize risks differently depending on their cultural background. Perceived risk attributes are thus not necessarily as universal as was initially thought (Sjöberg et al. 2004).

Sociologists have in particular highlighted that the evaluative process of risk perception is determined by values and cultural peculiarities (Slovic 1999; Renn 2008, 144). Deeply embedded within specific cultural context of beliefs, norms and moral convictions, values provide orientations for judging and guiding behaviour, and allow individuals to evaluate issues, including risks, as positive or negative (Renn 2008, 119). Table 4 illustrates value clusters with their social and cultural conditions proposed by Renn (2008, 120).

Cluster name	Examples	Function
Traditional values		
	Patriotism, regional or ethnic identity, social status and family stability	Group and cultural identity
Work ethics		
	Diligence, punctuality, efficiency, discipline and deferred gratification	Functionality and efficiency
Hedonistic values		
	Consumption, enjoyment, fun and immediate gratification	Incentive and motivation
Post-materialistic values		
	Harmony, social responsibility, environmental quality, decentralization and quality of life	Moral legitimization and cultural commitment

Table 4 Value clusters (Renn 2008, 120).

It depends on a persons' value system, whether he or she gives priority to economic benefits while emphasizing the positive aspects of certain technologies, or chooses to support environmental aspects and a healthy lifestyle leading to a more negative attitude towards certain technology. Renn (2008, 120) denotes, however, that commonly, people demonstrate a mix of value clusters. For instance, people valuing efficiency may still care about environment.

There are no clear results on how strong the impact of values on risk perceptions is. It is believed that values have a more indirect influence to risk conceptualization. As Renn (2008, 121) argues, "they act as selection and attention filters and add emotional colour to processing and weighing conflicting information on risks."

2.4 Methodological model of risk communication and risk perception

Reviewed literature on risk communication and risk perception indicates that current approaches are more or less trapped in a certain frame, limiting the conceptualization of and research on risk. For instance, technical-scientific approaches provide valuable insights for risk-related decision-making; however, they have been criticized for a narrowness in risk identification, estimation and management, since technical risk analyses just partially indicate individuals' and society's risk experiences (Bradbury 1989; Beck 1992; Slovic 1999; Amendola 2001; Taylor-Gooby and Zinn 2006; Breakwell 2007; Renn 2008). Therefore, numerous scholars have called for a holistic approach to risk that could widen the overall understanding of the phenomenon by integrating various approaches in a complementary manner (Althaus 2005, 581–582; Renn 2008, 42; Burns and Slovic 2012, 582).

The present study attempts to combine risk communication and risk perception theories while relying on the sociocultural position merged with the psychometric paradigm. The aim is to reconcile objective and subjective aspects of risk, which is seen as a context-bounded cultural phenomenon that can be explained on the grounds of certain factors.

Based on the literature review, a methodological model of risk communication and risk perception was designed for the purpose of this study (see Figure 3). It was inspired by a previously presented integrative model of risk perception (Renn and Rohrmann 2000 referred in Renn 2008, 141–145), and expanded by adding the dimension of risk communication. The methodological model of risk communication and risk perception may not only serve as an abstract representation of involved domains, but also as a systematic tool with a certain body of principles and practices, enabling an understanding of mutual dialogue between organizations and the public at large in the social arena of risk.

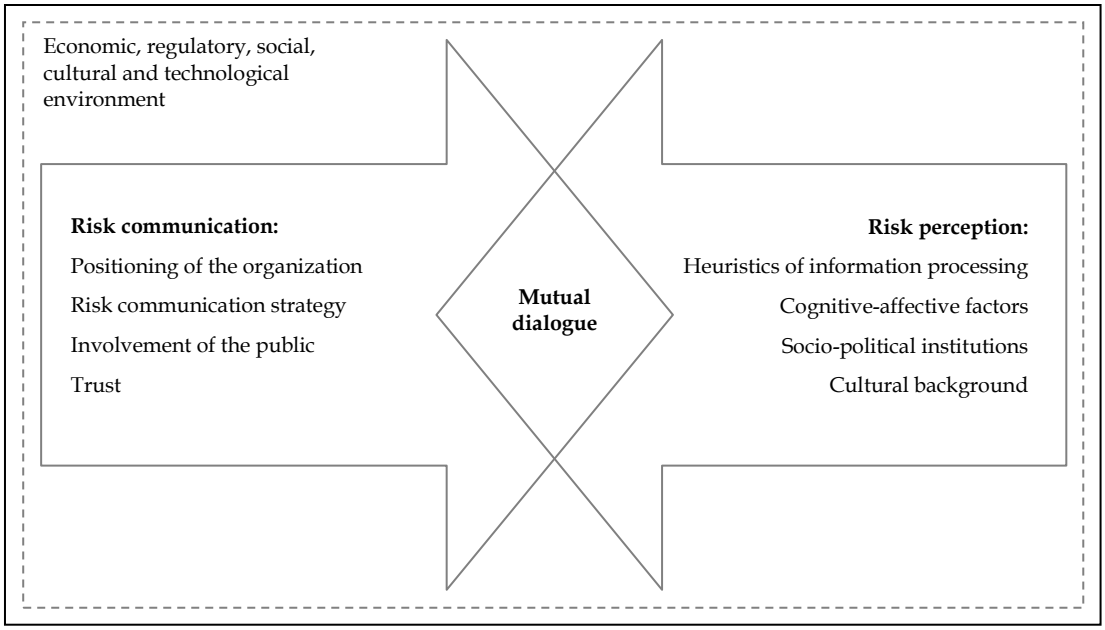

Figure 3 The methodological model of risk communication and risk perception.

The methodological model of risk communication and risk perception constitutes two arrows standing for the research domains in question with distinct contextual levels. Overall risk communication of organization is impacted by the following levels:

- positioning of the organization, that refers to the organization's stand in the social arena of risk in terms of opinion about itself and its status, perceived role and its attitudes towards certain issues;
- risk communication strategy denotes the organization's communication activities, communication channels and monitoring peculiarities of the public's perceptions of the risk in question;
- involvement of the public, or the used public involvement mechanisms by the organization;
- trust that is reflected by the meaning of trustworthiness for the organization and employed means of building it.

Meanwhile, risk perception of the public at large is assumed to be grounded on these contextual levels:

- heuristics of information processing that signifies certain rules of thumb, intuitive judgments or common-sense reasoning in a search for decisions or problem solutions while evaluating certain risks;

- cognitive-effective factors, meaning the evaluation of probability and desirability of potential consequences of, as well as arising emotional responses to the risk in question;
- socio-political institutions, or the risk-initiating and risk-managing organizations that impact public's attitudes towards, and trust in them;
- cultural background, meaning certain values and cultural peculiarities of the public, which provide the grounds for its judgements and behaviour in respect to certain risks. (Renn and Rohrmann 2000 referred in Renn 2008, 141–145.)

The horizontal position of the arrows of risk communication and risk perception denotes the equal importance of both dimensions for mutual dialogue between risk-related organizations and the public at large in the social arena of risk, in certain economic, regulatory, social, cultural and technological environment.

3 EMPIRICAL STUDY DESCRIPTION AND METHODOLOGY

This section is devoted to the delineation of the empirical study and its methodology. Since risk communication and risk perception are assumed to be context-bounded cultural phenomenon, they cannot be studied without a historical and cultural setting. Therefore, the nuclear power debate in Lithuania – the research object of this empirical study – is contextualized while presenting the history of nuclear power in this particular country. Later on, the aims of the case study and research questions are delineated. Finally, qualitative and quantitative parts of the study are described.

3.1 The case of nuclear power in Lithuania

The empirical part of the master's thesis was based on a case study focusing on the nuclear power debate in Lithuania. This particular case was chosen as a research object because of it being recent and actual. Currently, the decommissioning of the State Enterprise Ignalina Nuclear Power Plant, and plans to build a new plant raise intense discussions in Lithuania, with other countries weighing the pros and cons of nuclear power.

Since the 1980s, the Ignalina Nuclear Power Plant[3] (hereafter INPP) was the only nuclear energy source in Lithuania. Its facilities were situated in Visaginas town, in eastern Lithuania. It had two 1380 megawatt electric (MWe) RBMK reactors, also known as the Chernobyl-type rectors, operating since 1985 and 1987. The accident at the Chernobyl Nuclear Power Plant, which occurred during the completion of Unit 1 and at the end of

[3] In Lithuanian *Ignalinos Atominė Elektrinė*, IAE.

construction work of Unit 2 of the INPP, had a great impact on the upraising of Lithuanian independence activism and environmental movement against nuclear power. Lithuanians demanded safety inspections of two Chernobyl-type rectors of the INPP, the discontinuation of construction works of Unit 3, and the cancelation of plans to build a fourth one (INPP 2010; VATESI 2010.). According to Vähä-Sipilä (2004, 7), at that time the INPP was associated with Soviet oppression and occupied a central role in the endeavour of national sovereignty.

The symbolic position of the INPP changed radically after the declaration of Lithuania's independence in March 1990 (Vähä-Sipilä 2004, 7). The INPP proved to be the most significant energy source guaranteeing the country's material wellbeing and independence when the Soviet Union imposed an energy embargo on Lithuania. Around 10 years later the nuclear power dilemma was again on the Lithuanian political agenda, when potential state membership in the European Union (EU) was discussed. The decommissioning of the INPP due to its similarities to the failed Chernobyl Nuclear Power Plant[4] was one of the prerequisites for EU integration. The idea of the closure of the only nuclear power plant in the country seemed unfair[5], and it was associated with the loss of recently gained independence. Thus, the INPP became a symbol of national sovereignty. (Vähä-Sipilä 2004, 7; INPP 2010.)

In May 2004, Lithuania joined the EU and had to fulfil the agreement regarding the INPP. Unit 1 of the plant was terminated in December 2004 and Unit 2 was shut down in December 2009. Since the closure of the INPP, the possibility of the implementation of the Visaginas Nuclear Power Plant project[6] that comprises construction of a new nuclear power plant and the related infrastructure in Lithuania was considered. (INPP 2010; VATESI 2010.)

[4] According to Bodansky (2004, 176–181), the Chernobyl-type reactors were more vulnerable to malfunctions and accidents than more commonly used light water reactors.
[5] In 2002, Lithuania was leading in dependence on nuclear power, compared to other countries. At that time, the INPP generated 80% of Lithuania's electricity. (Bodansky 2004, 50.)
[6] More information about the project is available on the Internet: <URL:http://www.vae.lt/en/>. 26.4.2012.

3.2 Research questions

Since the purpose of the present study was to investigate risk communication and risk perception, the analysis of the nuclear power debate in Lithuania had two aims: to examine the overall risk communication of Lithuanian organizations related to nuclear power, and investigate citizens' perceptions about the technology. The research questions addressing delineated intentions are as follows:

> RQ 1: *How do organizations in Lithuania communicate about nuclear power and related risks?*

The question sought to reveal the risk communication of Lithuanian organizations that are dealing with nuclear power issues by examining their positions in the nuclear power debate, risk communication strategies, efforts to involve the public, as well as trust.

> RQ 2: *How do Lithuanians perceive nuclear power?*

The purpose of this research question was to find out Lithuanians' conceptualization of nuclear power by investigating their attitudes towards the risks and benefits of the technology, as well as its future prospects in the country, their sources of information about nuclear power, their willingness to participate in nuclear power decision-making process, and their cultural values.

3.3 Methodology

In order to answer the posed research questions, multiple data-gathering and analysing methodologies were employed in a complementary manner. The first part of the empirical study, which focused on the risk communication of target organizations, was grounded on the qualitative content analysis of the primary data set gained from interviews. The insight into Lithuanians' perceptions about nuclear power was sought through the quantitative study of the secondary data set, presented in the second part of the empirical investigation. The details of these two parts and their data are further explained in the succeeding subsections.

3.3.1 Qualitative study on risk communication

The risk communication of Lithuanian organizations dealing with nuclear power issues was scrutinized on the basis of qualitative research, as it was expected to generate more in depth perspectives to the examined issue. With the focus on interpretations and experiences of the social world, qualitative research is not necessarily considered as a unified set of approaches and research methods. However, it provides flexible and socially contextual data gathering methods, and analysis possibilities enabling an understanding and explanation of complexity, detail and investigated context (Mason 2002, 2–4).

Research sample

Qualitative sampling is commonly adjusted for the purpose of research objectives (Daymon & Holloway 2002, 157–159). The present qualitative study on risk communication is not an exception, where Lithuanian organizations dealing with nuclear power issues were chosen for the research sample. Desk research and analysis of field of forces of nuclear power (see Appendix 1) were conducted in order to identify the major players of the nuclear power debate in Lithuania, and to find the most suitable interviewees for the study.

Universities, governmental bodies, political parties, and regulatory authorities were among the organizations chosen for the study. In total, nine organizations from Lithuania were contacted with an inquiry about the participation in the research. The following three organizations agreed to contribute to the present study: The Seimas of the Republic of Lithuania represented by the Nuclear Energy Commission, the Nuclear Power Safety Inspectorate (hereafter called VATESI[7]) and the Greens. The informants are presented in Table 5.

[7] In Lithuanian 'Valstybinė atominės energetikos saugos inspekcija', VATESI.

Organization	Description	Additional information
The Seimas of the Republic of Lithuania	The parliament of Lithuania	The Nuclear Energy Commission of Seimas is in charge of nuclear issue management.
The Nuclear Power Safety Inspectorate	Governmental institution responsible for nuclear safety	Similar to the Radiation and Nuclear Safety Authority, known as STUK, that operates in Finland.
The Greens	A group pursuing environmental ideas	The general term "Greens" was used, since at the time of interview, this group have not yet officially registered as a political party.

Table 5 Informants of the qualitative study.

Data collection, treatment and analysis

The target organizations were contacted via email with a short description of the study, and asked for a telephone interview regarding nuclear power issues in Lithuania. However, the representatives of the organizations that were eager to participate in the present study did not want to be interviewed. They preferred answering in written form instead.

The construction of the questionnaire (see Appendix 2 and 3) was based on a structured approach, in order to gather easily comparable data (Frey, Botan and Kreps 2000, 101), and followed the delineated levels of the methodological model of risk communication and risk perception. It consisted primarily of open-ended questions, enabling an avoidance of subjective leading and encouraging informants to respond according to their knowledge and/or feelings about the inquired matter (Frey et al. 2000, 100). The questionnaire was tested twice and improved on the basis of feedback.

The qualitative data were collected between November 2010 and January 2011, as well as May and June 2012. A few follow-up e-mails were sent to the organizations asking for clarification of some answers or additional information. The data were examined using a qualitative content analysis approach. In order to highlight the most outstanding differences between the informants, gained answers were individually interpreted and reported, to avoid subjectivity and generalization – the most common limitations of qualitative studies (Daymon & Holloway 2002, 7).

Evaluated levels

An insight into the risk communication of the target organizations was gained by evaluating them on further levels that were chosen in accordance with the reviewed literature. The summary of these levels and their indicators is provided in Table 6.

Level	Indicators
Positioning of the organization	Opinion of themselves Perceived role in nuclear power debate Importance of nuclear issues in organization's agenda General attitudes towards nuclear power and its future in Lithuania
Risk communication strategy	Communication activities Used communication channels Monitoring of citizens' perceptions of nuclear power
Public involvement	Employed involvement of the public mechanisms Need of referendum concerning the building of a new nuclear power plant
Trust	Meaning of trust to the organization Means of building trust

Table 6 Levels and their indications evaluated in the qualitative study on risk communication.

The positioning that refers to the organization's stand in risk issue arena was analysed on the basis of the target organizations' opinion of themselves, their perceived role in the nuclear power debate, the importance of the nuclear issue in their agenda, as well as attitudes towards the technology and its future in Lithuania.

The peculiarities of the risk communication of target organizations were examined by investigating their communication activities in regard to nuclear power issues in Lithuania, used communication channels, and efforts to monitor citizens' perceptions about nuclear power.

The involvement of the public was evaluated on the grounds of organizations' willingness to involve the public in decision-making on nuclear power issues in Lithuania, as well as their attitudes towards the need of a national referendum where citizens could express their opinions about the building of a new nuclear power plant.

Finally, the trust dimension was examined while analysing the meaning of trust to Lithuanian institutions, and the means they used to gain this asset.

3.3.2 Quantitative study on risk perception

Lithuanians' risk perceptions of nuclear power issues were examined while using quantitative research providing tools and methods for large-scale survey data analysis. With the possibility of sample generalizability, survey research aids in delineating a representative picture of the attitudes and characteristics of an investigated population (Schutt 2006, 235).

Survey data

Quantitative study material was taken from a data set of the RINOVA (Public Risk Perceptions and Communication in Knowledge Society) research project that was conducted in cooperation with Kaunas University of Technology, Vytautas Magnus University, the Social Research Institute and Aalborg University. The project was funded by the Lithuanian Science and Studies Foundation. The final report of the RINOVA project as well as raw quantitative data was obtained from Vytautas Magnus University.

Data from the RISICUS study, which was conducted within the framework of the RINOVA project[8], appeared to be the most suitable, since its goals were similar to the goals of the present study. It focused on risk perceptions of the public and communication in the context of nuclear power, as well as other risks concerning climate change and genetically modified organisms that were left out of the scope of this study.

Survey questionnaire design

The original survey questionnaire with the most relevant issues in Lithuania was constructed for the RISICUS study (RINOVA final report 2009, 33). However, it was not found in any sources available for the researcher. Therefore, further presented description of the survey questionnaire (see

[8] Other interrelated parts of the RINOVA project were the MEDIA focusing on content and contexts of public risk communication in the media, and CIVICUS concentrating on civic society as well as innovative institutional governance.

Appendix 4 and 5) was based on the information gained from the RINOVA final report as well as raw statistical data.

The Lithuanian and Russian survey questionnaire was used for collecting data for the RISICUS study. It was organized according to three themes concerning perceptions about nuclear power, climate change and genetically modified organisms. Additionally, questions related to possible factors as well as background information were included in the survey questionnaire. (RINOVA final report 2009, 33–35.)

The survey questionnaire consisted primarily of closed-ended Likert scale questions allowing a choice from 1 to 5 that best represented the informant's opinion. As it was assumed that some questions might be difficult to answer, there was a "Hard to say" option. In some cases, it was also possible to express an answer that was not mentioned among the answer possibilities. (RINOVA final report 2009, 33–35.)

Data collection, treatment and analysis

The quantitative data for the RISICUS study were gathered four times (see Table 7). In 2008 gathered data for the main investigation of the project were re-examined in the present study, since the other material was not available for the researcher.

No.	Date	Range (N)	Purpose
1.	06.–14.12.2007	1002	Exploratory
2.	19.–30.06.2008	1000	Investigatory
3.	04.–09.09.2009	1004	Complementary
4.	02.–12.10.2009	1004	Complementary

Table 7 Surveys conducted for the RINOVA project (RINOVA final report 2009, 35).

The fieldworks of the RISICUS study were carried out by an independent institution of public opinion and market research Vilmorus Ltd. in 21 cities and 63 villages in Lithuania. Multi-stage sampling, which was employed while collecting the data, was organized so that each person in the population had an equal chance of being selected. In order to diminish the disadvantages of the survey questionnaire method, a face-to-face data-gathering technique in people's homes was conducted on the basis of a semi-structured approach. This enabled more precise answers to be gathered,

concerning such a complex issue as risks by asking follow-up questions or clarifying them to the respondents. (RINOVA final report 2009, 33–35.)

In the present study, the examination of the quantitative material of the RISICUS project was grounded on a secondary data analysis enabling an investigation of readily available statistical data. Secondary data refers to previously collected data that are used in a different manner, or to answer different research questions than intended by those who gathered the data (Schutt 2006, 411). This approach was chosen because of the large high-quality database of the RINOVA research project that would be unfeasible for the researcher to gather on her own. Moreover, it is important to note that the background work that has been already done while collecting the data has a pre-established degree of validity and reliability (Schutt 2006). However, the secondary data analysis set some limitations for the researcher. The use of pre-existing data collected by others and for other purposes restricted the formation of research questions and methodological choices of the present study, as well as to some extent hindered the accomplishment of the analysis of the data.

The raw quantitative data of the RISICUS study were re-examined with the help of the Statistical Package for the Social Sciences 18 (SPSS) software package. The following methods of statistical data analysis were used in order to summarize and generalize the findings:

- Descriptive statistical data analysis

The aim was to characterize the quantitative data in the form of condensed numerical indicators (e.g. percentages, means, standard deviations[9]) summarizing and providing visual displays of the data (e.g. tables, horizontal bar charts, crosstabulations) in order to clarify and highlight important information.

- Inferential statistical data analysis

One purpose of this method was to estimate features of the population from the gathered data on a sample. Moreover, the inferential statistical analysis was employed in order to test for significant statistical differences between groups (e.g. Independent-Sample t Test, one-way ANOVA), and significant statistical relationships between the variables (e.g. Spearman's correlations).

[9] Standard deviation (hereafter SD) refers to a measure explaining how much scores in a set of interval/ ratio data vary from the mean (Frey et al. 2000, 301).

Evaluated variables

The analysis of the quantitative data was based on the evaluation of demographic and risk perception variables that were chosen in accordance with studied literature as well as available data.

Among the most commonly used demographic variables are gender, age and education in prior sociology and psychology research (see, for example, Slovic 1999; Breakwell 2000; Tulloch and Lupton 2003; Special Eurobarometer 324 2010). Therefore, those characteristics of the respondents providing potential sources of demographic variations were chosen to be cross-tabulated throughout the analysis of perceived benefits, risks and future prospects of nuclear power.

In addition to mentioned demographic characteristics, three risk perception variables were measured. They were chosen according to the literature (see subsection 2.3) and available data. The summary of assessed variables and their indicators is provided in Table 8.

Variable	Indicators
Dread	Danger associated with nuclear power
Trust	Trust in science and technology to assure nuclear safety

Table 8 Risk perception variables and their indicators evaluated in the quantitative study on risk perceptions of the public.

The variable 'dread' was chosen in order to find out how dangerous nuclear power is in the eyes of the public at large. This independent variable was assessed while measuring the danger associated with nuclear power, and correlating it with perceived benefits and risks of nuclear power, as well as the future prospects of this technology in Lithuania.

The variable 'trust' was delineated to trust in science and technology to assure nuclear safety, because of the limitations of the quantitative data, as well as the generality of the term. This independent variable was analysed while searching for significant statistical differences and relationships between it and Lithuanians' perceptions about benefits, risks and future prospects of nuclear power.

Respondents

The citizens of Lithuania were the respondents of the RISICUS survey. There were 43.5% (n=435) of men and 56.5% (n=565) of women among the 1,000 respondents of the study. The respondents were between 18 and 97 years of age, and the mean age was 49.4 years. The greatest number of the respondents (32.4%, n=324) had vocational education. 24.4% (n=244) were educated to university level, and 22.1% (n=221) of the interviewed had a secondary education. An overview of the socio-demographic characteristics of the respondents is provided in Appendix 6 Table 10.

4 RESULTS AND ANALYSIS

The results of the empirical study and their analysis are presented in this section where qualitative study on risk communication of Lithuanian organizations is followed by the quantitative evaluation of risk perceptions of the public at large.

4.1 Risk communication of the organizations

The risk communication of Lithuanian organizations that are dealing with nuclear issues was sought to explain through qualitative data analysis. It focused on the positioning of the organizations, their risk communication strategies and efforts to involve the public, as well as organizations' attitudes towards trust. This section is concluded with an overview of the qualitative findings.

4.1.1 Positioning of the organizations

The stances of the organizations in the debate about nuclear power was analysed on the basis of informants' opinions about themselves, their perceived role in the nuclear power debate, the importance of nuclear issues in their agenda, as well as attitudes towards energy generating technologies that should be developed in Lithuania.

VATESI characterized itself as a neutral, independent and professional institution that is responsible for nuclear safety. The informant appeared to be the main regulatory and supervisory institution of nuclear safety in Lithuania that sets safety requirements, controls whether they are complied

with or not, issues licences and permits, as well as performs safety assessments. Nuclear issues are of prime importance for VATESI. Since the institution "*does not make political decisions"*, it did not state its viewpoint on energy generation technologies that should be developed in Lithuania.

Seimas described itself as a body that represents citizens, initiates and makes decisions, and controls implementation of those decisions. This institution, guided by the Nuclear Energy Commission, claimed to be an active player in discussion concerning nuclear power development and safety, in order to assure strategic implementation of the state's interests. The decommissioning of the Ignalina nuclear power plant as well as nuclear power succession, development, and safety parliamentary control emerged as significant issues in this institution's agenda. The representative body of the citizens argued for the development of nuclear power in Lithuania, since the majority of Lithuanians supported this technology.

"*Ecology*", "*idealism*", "*creation*" and "*vision*" are words which best characterise the Greens which argued that, for the moment, the discussion about nuclear power issues is not taking place in Lithuania. Therefore, their aim was to initiate the debate or at least to make society and the decision-makers aware of alternative contra-arguments concerning this technology. Hence, the initiation of and active participation in the discussion on both the national and international levels appeared to be an important matter in the Greens' agenda. The organization was against nuclear industry because of nuclear safety doubts, pollution and the problem of nuclear waste disposal.

> To sum up, the interviewed organizations appeared to occupy different positions in the nuclear power debate in Lithuania, with VATESI representing a neutral but authoritative player, Seimas deciding to support nuclear power, and the Greens choosing an anti-nuclear stand in the nuclear issue arena in Lithuania.

4.1.2 'Yes' or 'No' to nuclear power?

The interviewed organizations' attitudes towards the future prospects of nuclear power in Lithuania, as well as the advantages and disadvantages they associate with the technology are covered in this subsection.

As a neutral organization, VATESI did not express its point of view about the need for a new nuclear power plant in Lithuania. However, it believed that the advantages of nuclear power outweigh the disadvantages. Among the benefits of the technology in question, VATESI mentioned the relatively low exploitation costs, the quite small territory required for nuclear power facilities, the little amount of fuel needed, the possibility of safe disposal of nuclear waste, as well as the eco-friendliness of nuclear power in comparison to fossil fuels that produce carbon dioxide emissions. Lastly, VATESI highlighted that "*properly maintained nuclear power can be safe and competitive, especially when striving to combine the increasing need for electric energy and fight against the greenhouse effect*." VATESI was convinced that "*everything is safe in nuclear power if it is well-maintained*" when considering possible drawbacks of the technology. The only concern of the institution appeared to be the unresolved issue of nuclear waste and its disposal in Lithuania.

Seimas – the advocate of nuclear power – was assured that "*Lithuania needs a new nuclear power plant in order to ensure the balance of the supply and demand of electric energy, the diversity of energy sources, the energetic independence and security of the country, and the decrease of the dependence on fossil fuels, and natural gas, that is provided by only one external supplier*." In addition to this, Seimas was similar to VATESI in claiming that the positive aspects of nuclear power overshadow the negative ones. The institution believed that properly exploited nuclear power is a safe, clean and cheap source of energy. Moreover, according to Seimas, "*Lithuania has all the prerequisites to develop nuclear power: experience (a legal base and specialists), infrastructure (the inheritance of the infrastructure of the Ignalina nuclear power plant), and the substantial support of the public*." Expensive decommissioning of a nuclear power plant and nuclear waste disposal were pinpointed as the disadvantages of nuclear power for Lithuania.

The Greens opposed the idea of building a new nuclear power plant in Lithuania, arguing that it is an inadequate object for Lithuania's "*environmental and economic conditions, as well as energy demand and long-term strategic plans*." They could not find any advantages of nuclear power that would outweigh its possible disadvantages such as pollution, doubtful economic validity, waste disposal, and the need of uranium.

> In conclusion, the discussed results show that VATESI stressed safety, Seimas political-legal and the Greens environmental aspects, while weighing 'Yes' or 'No' to nuclear power. Moreover, VATESI together with

> Seimas were inclined to support nuclear power, with the Greens occupying the opposite camp of the debate.

4.1.3 Risk communication strategy and public involvement

In the present subsection, the risk communication strategies of the target organizations and their effort to involve the public in nuclear power decision-making processes are analysed. Moreover, the informants' insight into citizens' opinions about and awareness of nuclear power issues is discussed in order to gain a deeper understanding of the overall communication strategies of the target organizations.

VATESI appeared to be well acquainted with citizens' attitudes towards and their knowledge about nuclear power. Media monitoring and public surveys were key procedures used by the organization that enabled them "*to find out the frailties of public communication and take them into consideration*." According to VATESI, in 2006 and 2009 ordered research, as well as a Eurobarometer study conducted in 2007 revealed a substantial support by Lithuanians towards nuclear technology. Nevertheless, the results also disclosed that citizens felt that they are not sufficiently informed about the issue. Public opinions regarding nuclear power issues had no direct influence on VATESI's decision-making. As a neutral institution, it has "*to make nuclear safety decisions independently from interest groups and their opinions*."

With one communication specialist out of a total of 68 employees, VATESI followed a more passive than active risk communication strategy, avoiding the promotion of nuclear power, but seeking to help society to come to informed decisions on the basis of expert opinions about the issue. The Department of International Communication and Public Relations in VATESI is responsible for the implementation of such communication strategy.

VATESI communicated about nuclear power to the public via press releases, website, annual reports, interviews and comments for the media, conferences, seminars and the like. However, it did not organize direct meetings with citizens (e.g. the inhabitants of Visaginas town that is close to nuclear facilities). All communication channels were important for the organization but especially significant were those, which enabled them to reach the largest audience.

As a neutral body, VATESI did not involve the public in nuclear decision-making processes. However, the organization together with other authorities and the public at large was able to participate in nuclear decision-making through the evaluation of the Environmental Impact Assessment Report, which concerns plans to build a new nuclear power plant. During the public meetings, involved citizens may comment on presented programmes. Their ideas must be considered before making any final decisions about nuclear power development possibilities in the country. Furthermore, VATESI did not state its position about the need for a referendum that would provide an opportunity for the public at large to express their attitudes towards the building of a new nuclear power plant.

Seimas of the Republic of Lithuania also claimed to be knowledgeable about the affirmative opinions of citizens regarding nuclear technology. However, the institution pinpointed that "*society needs to be further enlightened about the advantages and disadvantages of nuclear power, since it is still surrounded by numerous myths*." While talking about the awareness of the public regarding the issue, Seimas said the opposite though. According to the organization, "*the society of Lithuania is fairly well informed about nuclear power*". Such insights of the institution were based on surveys, news provided in the media, as well as the attitudes of members of society. The opinion of the public had a direct influence on the decisions concerning the nuclear power issues of Seimas, since it is "*the representative body of the citizens, and it cannot ignore opinion of the public about nuclear power*."

In the nuclear power debate, Seimas, having 33 communication specialists out of a total of 503 employees, took an active communicator's role, guided by the chairman of the Nuclear Energy Commission of Seimas. The media were pinpointed as one of the most significant mediums for the institution because "*their [journalists'] knowledge and position are especially important while shaping public opinion*." All media channels were equally important for Seimas in informing society about nuclear power. The institution argued that channels reaching a small auditory are commonly specialized, and enables them to go deeper into a matter. Moreover, Seimas appeared to use face-to-face communication with electrical power specialists, scientists, the inhabitants of Visaginas town, the representatives of society, and other interested parties in an on-going discussion about the prospects of nuclear power in Lithuania.

As the representative body of the citizens, Seimas directly involved society in nuclear decision-making by organizing special meetings for the interested members of the society. Hence, "*the decisions of the Nuclear Energy Commission of Seimas are determined by the interests of the state that are totally corresponding with the interests of the society*." Furthermore, the institution did not consider it necessary to organize a referendum concerning a new nuclear power plant building, since "*Lithuania is already a nuclear country, and, according to surveys, the society approves of further development of this technology*."

The Greens admitted that nuclear technology is substantially supported by the public at large because of a myth that "*a nuclear power plant may realize the nostalgic dream of a big country*." Nevertheless, the organization noticed that the unsmooth progress of a "*mysterious project"* regarding a new nuclear power plant building in Lithuania has increased uncertainty among members of the public and even politicians. The Greens regretted that Lithuanians do not know enough about the technology and are not interested in "*this risk*" because of "*opinion formers, general public mood, dominating 'ideas'*." The Greens gained insight into the public's attitudes towards nuclear power from the media, informal networks and channels. The opinions of the public at large had a significant impact on the decision-making of the Greens that expressed themselves with these words: "*From this [nuclear power] point of view we are more the society than an institution*."

Different from the other two institutions, the Lithuanian Greens appeared to be active communicators that strived for a more proactive position in the nuclear power debate. However, this young organization, with 500 members and five persons responsible for communication, did not have a proper work apparatus that could enable it to react to or initiate debates. The Greens communicated about nuclear power via social media and social networks, as well as conferences and discussions, but not directly with members of society. Social networking appeared to be the most significant channel of communication for the institution, since it was direct and fast.

The Greens were convinced that currently public participation does not exist in the nuclear power issue arena in Lithuania. Therefore, the organization was planning to involve society through ecological enlightenment. In other words, the Greens aimed to make Lithuanians aware of risks related to nuclear technology, hoping that this could eventually lead to the support of the organization and anti-nuclear decisions on the state level. The institution

did not see the need for a referendum concerning nuclear development or, as it was put, "*the destruction of environment*".

> In short, the results suggest that the positions of the interviewed organizations in the nuclear power debate tend to determine their risk communication strategy. VATESI, occupying a neutral stand, seemed to be a passive communicator, Seimas played a more active communicator's role, while the Greens strived for a proactive way of communication with the society.

4.1.4 Trust

The focus of this subsection is on the trust of the interviewed organizations. The matter is discussed while analysing what the trust of the public means to them, and how they seek this asset.

While talking about the value of trust of the public, VATESI stated: "*in our institution, the trust of the society means appreciation that we work well*." The interviewed institution claimed that it does not seek this asset directly because of its neutral regulator's role. However, VATESI strived to draw independent professional inferences regarding the safety of nuclear power facilities. The organization believed that this contributes to a better awareness of and trust in nuclear power, as well as the institution.

The trust of the people was the most important asset for Seimas, since it is the representative body of the citizens. The institution claimed that it seeks trust while "*enlightening society about nuclear power, involving it into an open discussion, explaining the meaning of decisions, striving that those decisions would be as transparent and beneficial as possible for society, [and] corresponding to strategic interests of the state*."

"*The trust of society would be the highest value*" for the Greens. The institution argued that it has to prove the destructive potential of nuclear power, as well as the benefits of alternative energy sources and an ecological life-style, in order to build trust in the organization.

> In sum, trust appeared to be a very significant asset to the interviewed organizations. It denoted acknowledgement for VATESI, the right to

> represent the citizens for Seimas, and the public's acceptance of ecologic ideas for the Greens.

4.1.5 Overview of qualitative findings

The results concerning the positioning of the target organizations, their risk communication strategies, efforts to involve the public, and attitudes towards trust suggest some implications that are presented in this subsection. The findings of the analysis are summarised in Table 9.

	VATESI	Seimas	The Greens
Positioning of the organization			
Function	Independent regulator of nuclear safety	Representative of the citizens	Proponent of ecology
Role in nuclear power debate	Regulator, consultant	Decision-maker	Influencer
Stressed issues	Safety issues	Political-legal issues	Environmental issues
Viewpoints on nuclear power	Neutral (supportive)	Supportive	Opposing
Position in nuclear power debate	Neutral	Pro-nuclear	Anti-nuclear
Risk communication strategy			
Organization size	68 employees	503 employees	500 persons
Number of communication specialists	1 employee	33 employees	5 persons
Sources of information about the public	Media, surveys	Media, surveys, direct contact with citizens	Media, informal networks and channels
Communication channels	Press releases, website, annual reports, interviews and comments for the media, conferences, seminars	Interviews and comments for the media , face-to-face meetings with citizens	Social media, social networks, conferences, discussions
Communication policy	Passive	Active	Active (proactive)
Communication purpose	To enlighten and help society to come to informed decisions	To inform society and shape its opinions	To enlighten and canvass society for anti-nuclear issues
Involvement of the public			
Involvement mechanisms	None	Direct	Direct
Need of referendum	No opinion	No need	No need
Trust			
Meaning of trust	Acknowledgement of work	Right to represent citizens	Acceptance of ecologic ideas
Used means of trust building	Enlightenment of the public about nuclear power	Enlightenment of the public about nuclear power, involvement of citizens into discussion, explaining made decisions, striving for transparency, as well as benefit for society and the state	Convincing about the destructive potential of nuclear power, as well as the benefits of alternative energy and an ecological life-style

Table 9 Summary of the results of the quantitative study.

The findings of the qualitative study suggest that the position which interviewed organizations occupied in the nuclear power debate tended to be impacted by their intrinsic function in society. VATESI has positioned itself as a neutral but authoritative organization, since it is an independent regulator of nuclear safety. As the representative body of the citizens that supports and makes decisions consistent with the majority's opinions, Seimas has chosen a pro-nuclear position in the debate. The Greens decided to stand for the anti-nuclear point of view because of their main purpose to promote ecology.

The risk communication strategies of the interviewed organizations depended on their occupied position in the debate about nuclear power. As a neutral institution, VATESI practised passive communication with a "neutral" purpose to enlighten society and help individuals to come to informed decisions. Seimas, the advocate of nuclear power, appeared to be an active communicator seeking to inform society and shape its opinions. The Greens used active communication policy and strived to take a more proactive step (e.g. initiate debates in society) in the near future. The aim of their communication was to enlighten and canvass society for anti-nuclear issues.

In respect to the involvement of citizens in nuclear power decision-making processes, VATESI appeared to be an impartial organization that did not consult with the public about nuclear issues. However, Seimas, the representative body of the citizens, directly involved the interested members of society in nuclear decision-making. The Greens believed that public participation does not exist in the nuclear power issue arena in Lithuania, and planned to involve society through communication about risks related to nuclear technology, and environmentally friendly alternatives.

Trust appeared to be a significant asset for the organizations, although they tended to attribute different meanings to it. Trust denoted the acknowledgement of work for VATESI, the right to represent citizens for Seimas, and society's acceptance of ecologic ideas for the Greens. Communication about nuclear power with the purpose to inform the public was the means to acquire this valuable asset for VATESI. Seimas strived not only to communicate with, but also involve citizens in discussions about the issue, while hoping to boost trust in the organization. Meanwhile, the Greens

aimed to convince society about the risks of nuclear power and the benefits of available alternatives in the fight for trust and support.

4.2 Risk perceptions of the public

Risk perceptions of the citizens of Lithuania were examined on the grounds of the scrutiny of the quantitative survey data. After an overview of the general concerns of the people, their attitudes towards risks and the benefits of nuclear power, as well as perceived future prospects of the technology were studied. Moreover, information sources, willingness to participate in nuclear power decision-making processes, and cultural values of the citizens of Lithuania were covered. An overview of the findings concludes the quantitative analysis.

4.2.1 General concerns of the public

Before focusing on nuclear power, the general concerns of Lithuanians were investigated in the broader context of social, political, ecological and economic issue arenas.

As illustrated in Figure 4, among the most relevant problems in Lithuania were the increase in prices (97.3%, n=974), road safety (91.4%, n=915), alcoholism (91.0%, n=911), criminal offence (88.5%, n=886) and corruption (86.9%, n=870). Energy dependence, influencing economic growth and wellbeing of the state, appeared at number nine on the list. The issue was significant for 78.4% (n=785) of the respondents. Moreover, environmental issues (e.g. air and water pollution, household waste, climate change) got moderate attention in Lithuanian society.

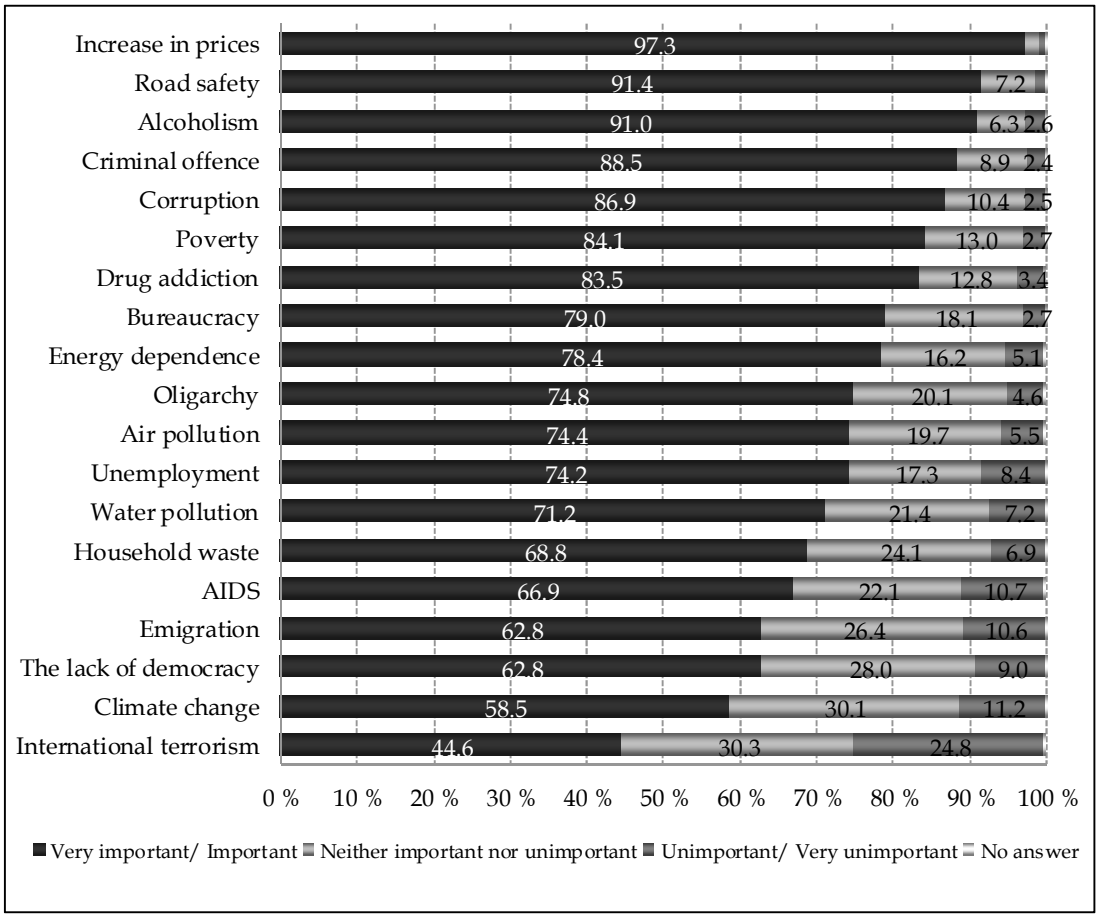

Figure 4 Percentage distribution of answers to the question: "*What, in your opinion, is the most relevant problem in Lithuania?*" Values below 2% are not indicated in the figure.

Some respondents (6.2%, n=62) expressed other concerns that were not on the provided list. However, nuclear power and related risks were not mentioned among these problems. Instead, mainly social concerns (e.g. healthcare, education, homeless people etc.) were highlighted.

> To sum up, economic and social wellbeing problems were prioritized, while environmental issues attracted less attention in Lithuanian society.

4.2.2 Perceived value and future prospects of nuclear power

The focus of this subsection was on the perceived benefits of nuclear power as well as its future in the energy mix of Lithuania.

Perceived value of nuclear power

The comparison with the perceived benefits of the Ignalina nuclear power plant and a new plant, which may possibly be built in Lithuania in the near future, revealed quite similar attitudes of the public at large[10] (see Figure 5). Further analysis of people's perceptions regarding a new nuclear power plant was left out of the scope of this study. A deeper insight into the perceived advantages of nuclear power was gained by examining the respondents' attitudes towards positive aspects of the Ignalina. This choice was made because there were no prominent differences between the cases. Additionally, direct or indirect people's experiences of the Ignalina nuclear power plant were more likely to yield reliable results than the examination of perceptions about the vision of the building of a new nuclear power plant.

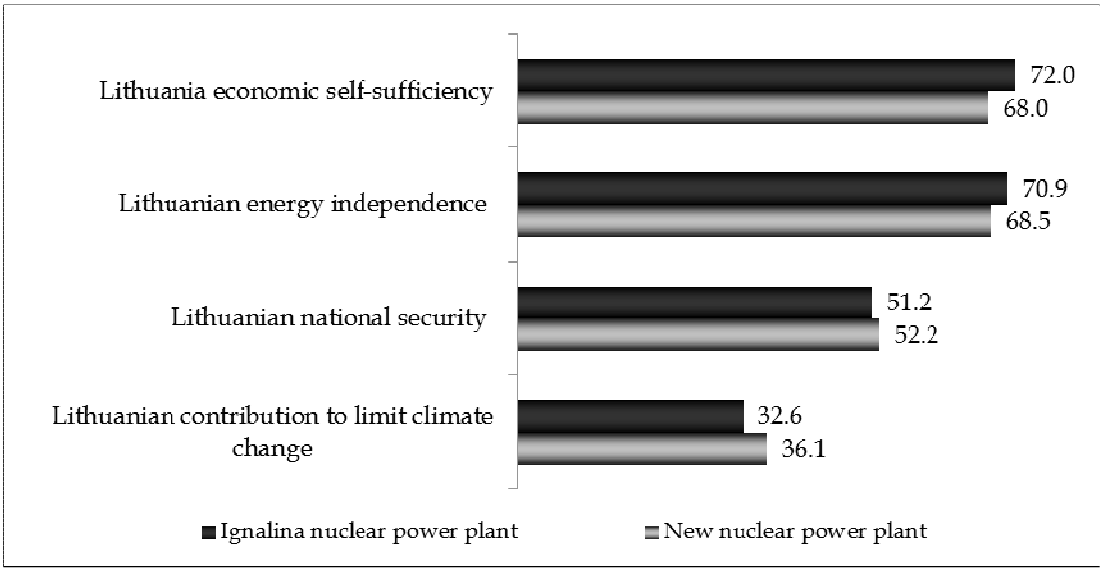

Figure 5 Percentage distribution of answers to the question: "*What does, in your opinion, the current Ignalina and new nuclear power plant mean for Lithuania?*" Ranking is based on "Totally agree" and "Tend to agree" results.

According to the results, the Ignalina nuclear power plant was associated with such beneficial aspects as economic self-sufficiency (72.0%, n=721) and energy independence (70.9%, n=710) of the country. A substantially minor group of the respondents believed in the plant's contribution to enhance the national security of the country (51.2%, n=513) or limit climate change (32.6%, n=326).

[10] Questions 7 and 8 from the survey of the RISICUS study were combined and presented here.

The statements concerning the benefits of the Ignalina nuclear power plant were further analysed by socio-demographic and risk perception factors. Males and females evaluated the plant's advantages for the country similarly. Hence, gender had no statistically significant influence on Lithuanians' perceived value of nuclear power.

A socio-demographic breakdown by age disclosed a correlation between the variable 'age' and the statement regarding the national security of Lithuania, but the relationship was very weak (Spearman's rho=0.112, $p<0.01$). People of 65 years of age and older were more likely to perceive nuclear power as a guarantee of Lithuania's national security than the respondents between 18–44 years old.

No statistically significant relationship was detected between the education variable and the perceived benefits of nuclear power. However, the favourable opinions of the respondents with an incomplete university degree significantly diverged from the other respondents. Thus, education had a minor overall impact on perceptions of the advantages of nuclear power.

Very weak negative correlations as well as considerable opinion differences were detected between the variable 'danger' and nuclear power's positive influence on Lithuania's economic self-sufficiency (Spearman's rho=-0.199, $p<0.01$), and energy independence (Spearman's rho=-0.155, $p<0.01$). These results suggest that the higher the danger associated with nuclear energy, the lower the perceived value of the benefits and vice versa.

Moderate but somewhat significant weak correlations between trust in science and technology to assure nuclear safety and benefits of nuclear power revealed that the more people trust in science and technology, the more they accept the advantages of nuclear power and vice versa. Prominent trust in science and technology of the respondents was prevailing in all cases (see Table 11 in Appendix 6).

> To sum up, economic-political aspects emerged as the most significant advantages of nuclear power among Lithuanians, with the older generation believing that nuclear power may guarantee the national security of the country. Past experience of, for instance, occupations, might have had an impact on such perceptions about nuclear power. The attributed value to the Ignalina nuclear power plant tended to rely on a

perceived low extent of danger, as well as trust in science and technology to assure nuclear safety.

Future prospects of nuclear power

Future prospects of nuclear power in Lithuania were analysed on the basis of the citizens' attitudes towards the considerations to build a new nuclear power plant, as well as possible scenarios of nuclear policy development in Lithuania.

According to the results presented in Figure 6, almost half of the respondents (49.2%, n=492) supported and one fifth (20.9%, n=209) rejected the idea of the building of a new nuclear power plant in Lithuania. In consistence with the previously presented results, 48.7% (n=487) of Lithuanians opposed a statement that there is no need of building a new nuclear power plant in Lithuania, since energy demand of the state may be supplied by other energy sources. However, 22.0% (n=220) of the respondents were of the same opinion with the statement.

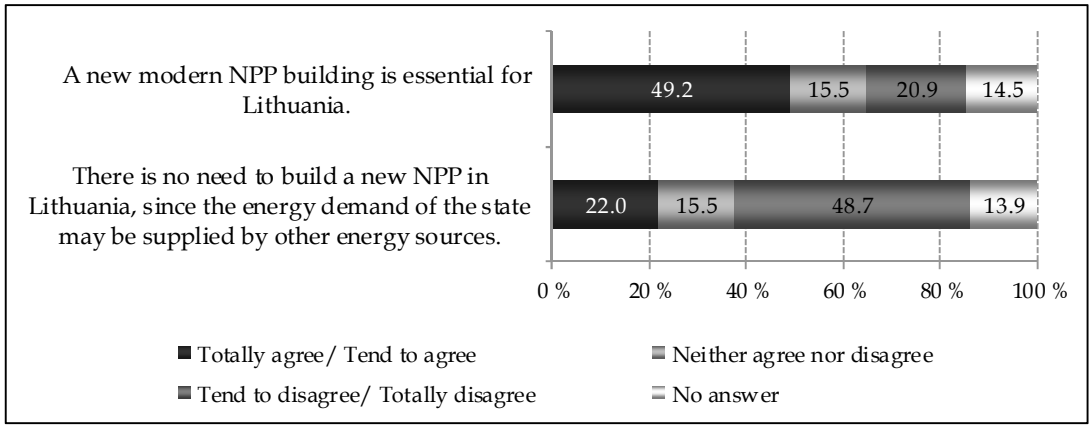

Figure 6 Percentage distribution of the perceived future prospects of nuclear power in Lithuania.

Figure 7 illustrates the results of what an energy policy strategy would be most appealing for the citizens of Lithuania. The state's monopoly in a new nuclear power plant building, and management without a private share capital was supported by 57.6% (n=577) and opposed by 15.3% (n=153) of the respondents. The idea of a joint new nuclear power plant building in Lithuania with neighbouring states seemed acceptable for 50.6% (n=507) of the respondents and not acceptable for the 21.3% (n=213).

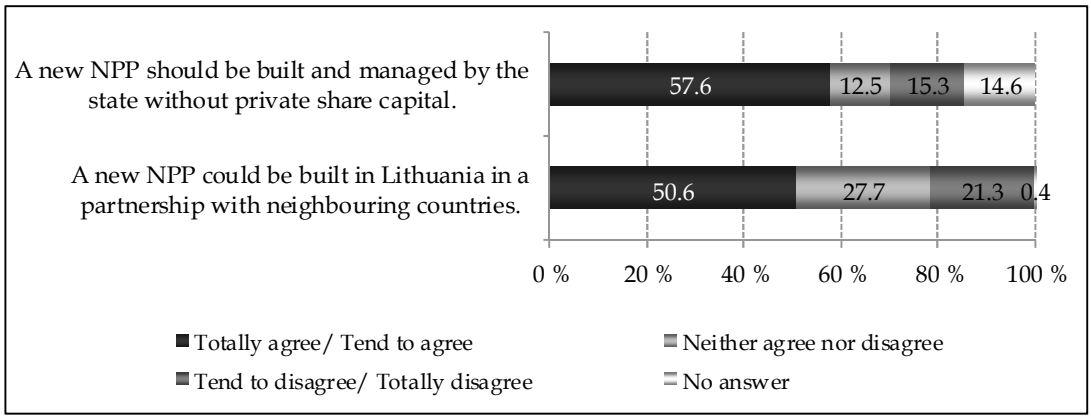

Figure 7 Percentage distribution of possible scenarios of energy policy development in Lithuania.

Some attitudinal patterns were detected while scrutinizing the latter four statements by demographic and risk perception variables. The results show a number of significant gender differences in perceptions about the future prospects of nuclear power and energy policy in Lithuania. Males recognised the necessity of a new nuclear power plant for Lithuania significantly more than females (M=3.7, SD=1.45 vs. M=3.4, SD=1.38; t(854)=2.44, p=0.005 while 1 meant "Totally disagree" and 5 – "Totally agree"). Accordingly, females agreed more than males (M=3.7, SD=1.41 vs. M=3.4, SD=1.34; t(860)=2.99, p=0.003) that there is no need to build a new nuclear power plant in Lithuania because of other options to generate energy. Moreover, males and females expressed similar opinions that a new nuclear power plant should be built and managed by the state without a private share capital. However, males tended to support statistically more a joint nuclear power plant building with neighbouring countries, compared to females (M=3.6, SD=1.33 vs. M=3.3, SD=1.26; t(995)=2.99, p=0.003).

Weak but significant correlating relationships were detected between the variable 'age' and statements regarding the state's monopoly in a new nuclear power plant building and management (Spearman's rho=0.122, p<0.01), as well as a new nuclear power plant building with neighbouring countries (Spearman's rho=0.122, p<0.01). All age groups, except the youngest, significantly agreed with the former statement. The interviewed people from the age groups of 18–24 and 35–44 were significantly more reluctant about the later statement than the rest of the respondents.

Demographic analysis by education revealed weak correlations between the 'education' variable and cases concerning the necessity or lack thereof of a

new nuclear power plant building in Lithuania because of other energy sources (Spearman's rho=0.087, $p<0.05$), and a new nuclear power plant building with other countries (Spearman's rho=-0.077, $p<0.05$). Respondents with a lower level of education tended to agree more with the first statement than the higher educated ones. Furthermore, the lower educated group of the respondents was also more likely to support the monopoly of Lithuania's government in the project of a new nuclear power plant building, while the higher educated respondents were more in favour of the development of nuclear power in Lithuania with other states.

The variable 'danger' had some statistically significant impact on respondents' opinions about the future prospects of nuclear power in Lithuania. Negative relationships between perceived danger and the need of a new nuclear power plant (Spearman's rho=-0.245, $p<0.01$), as well as the possibility of building it with other countries (Spearman's rho=-0.131, $p<0.01$) denote that the higher the perceived danger, the lower the support of the ideas. However, the necessity of a new nuclear power plant for the state, and its building with other countries were not associated with danger.

Trust in science and technology influenced Lithuanians' attitudes towards the necessity of a new nuclear power plant and the possibility of building joint nuclear power facilities for neighbouring states and Lithuania. Positive correlations (Spearman's rho=0.354, $p<0.00$ and Spearman's rho=0.274, $p<0.00$) suggest that the more people trust science and technology, the more they support those options.

> In short, despite favourable attributes towards nuclear power, support of the future development of this technology is not dominating in the country. There is also no clear consensus of opinions whether a new nuclear power plant should be built and managed by the state, or in a partnership with neighbouring countries. Better educated middle-aged men tended to believe that there is a need for a new nuclear power plant in Lithuania, and that it could be built together with other states. Lower educated women between the age of 18 and 44 years correspond to the profile of people having the opposite viewpoints. The perceived extent of danger and trust in science and technology appeared to have an impact on peoples' opinions concerning the future prospects of nuclear power in Lithuania.

4.2.3 Perceived risks of nuclear power

The analysis of perceived risks of nuclear power was based on the comparison of Lithuanians' attitudes towards nuclear technology and other debatable issues, as well as the scrutiny of the negative aspects of the Ignalina nuclear power plant that worried society.

In the wider context of various issues concerning science and technology development, as well as human health and environment, nuclear energy with the mean of 3.5 (while 1 meant "Not dangerous at all" and 5 – "Very dangerous") appeared at number nine on the list (see Figure 8). 54.3% (n=544) of the respondents regarded nuclear energy as dangerous, while 15.8% (n=158) did not attribute this characteristic to the technology. 29.9% (n=299) of the interviewed Lithuanians took a middle line, or did not state their opinions on the statement. Thus, in Lithuanians' opinion, nuclear power does not pose that much of a significant risk to human health and the environment as, for instance, food preservatives and additives (M=4.4), depletion of the ozone layer (M=4.1) or the disappearance of species (M=4.0).

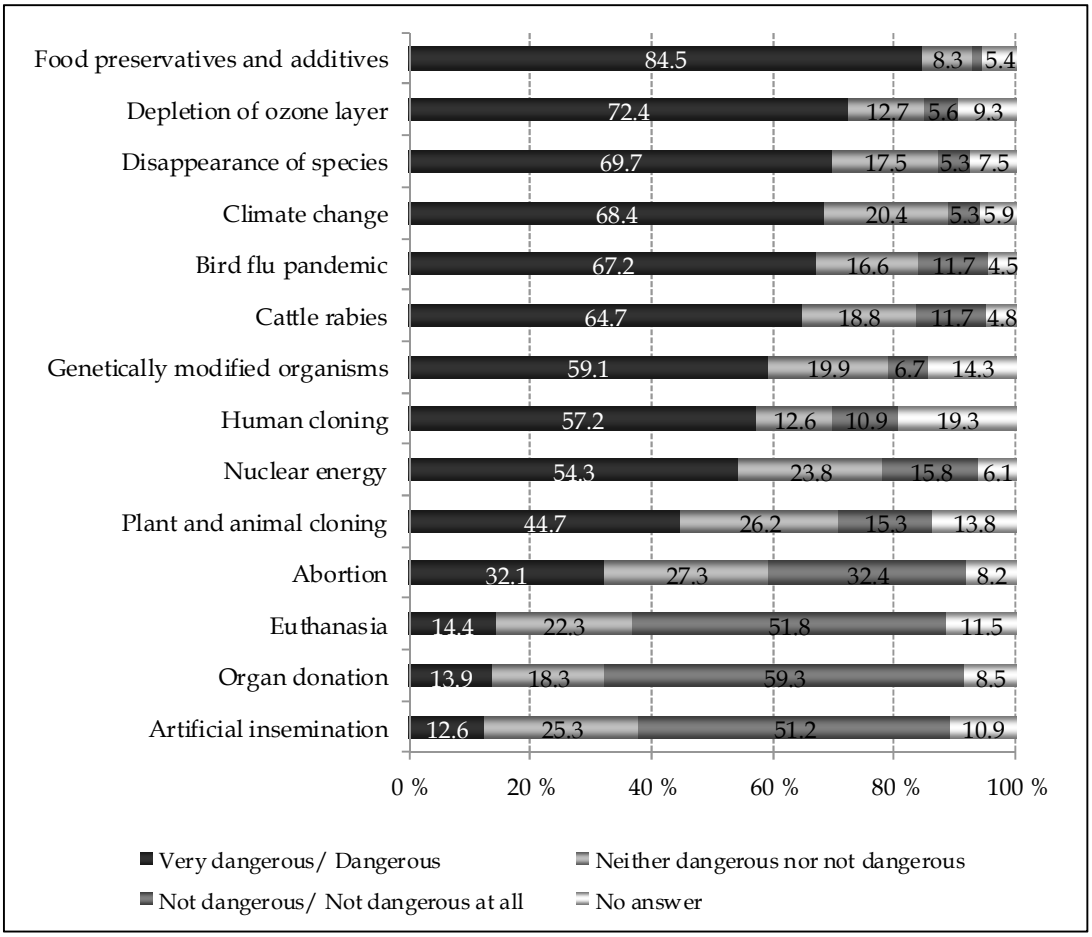

Figure 8 Percentage distribution of answers to the question: "*How dangerous are the issues related to science and technology development as well as human health and environment?*" The ranking is based on "Very dangerous" and "Dangerous" results. Values below 2% are not indicated in the figure.

Further analysis of Lithuanians' attitudes towards nuclear technology revealed certain patterns. Statistically significant differences were detected while comparing males' and females' opinions about the dangerousness of nuclear power. According to the results, nuclear technology was considered more dangerous by females than by males (M=3.6, SD=0.95 vs. M=3.4, SD=1.05; t(829.5)=-4.09, p=0.000).

The variable 'age' did not correlate with the perceived dangerousness of nuclear power. However, a weak but significant correlating relationship (Spearman's rho=0.114, p<0.01) was detected between variable 'education' and associated danger to nuclear technology. Significant opinion differences were observed between the respondents having a university and a vocational degree (M=3.4, SD=1.12 and M=3.4, SD=0.99), as well as secondary and primary (M=3.7, SD=0.90 and M=3.8, SD=0.79) education.

Trust in science and technology to assure nuclear safety significantly correlated (Spearman's rho=-0.189, $p<0.01$) with the perceived danger of nuclear power. Negative relationship between mentioned variables denotes that the higher the trust in science and technology, the lower the danger associated with nuclear power.

In order to find out what aspects determine negative attitudes towards nuclear power, the respondents' opinions about the disadvantages of the Ignalina and a new nuclear power plant were examined. The comparison of Lithuanians' attitudes towards these cases revealed quite similar perceptions (see Figure 9). Nevertheless, the Ignalina nuclear power plant was associated with a higher risk of malfunction than a new plant. The threat of oligarchy as well as economic burden for Lithuania's citizens was related more with a new nuclear power plant than with the Ignalina. Further analysis of people's perceptions regarding a new nuclear power plant was left out of the scope of this study, and an insight into the perceived risks of nuclear power was gained instead by investigating the respondents' attitudes towards negative aspects associated with the Ignalina nuclear power plant.

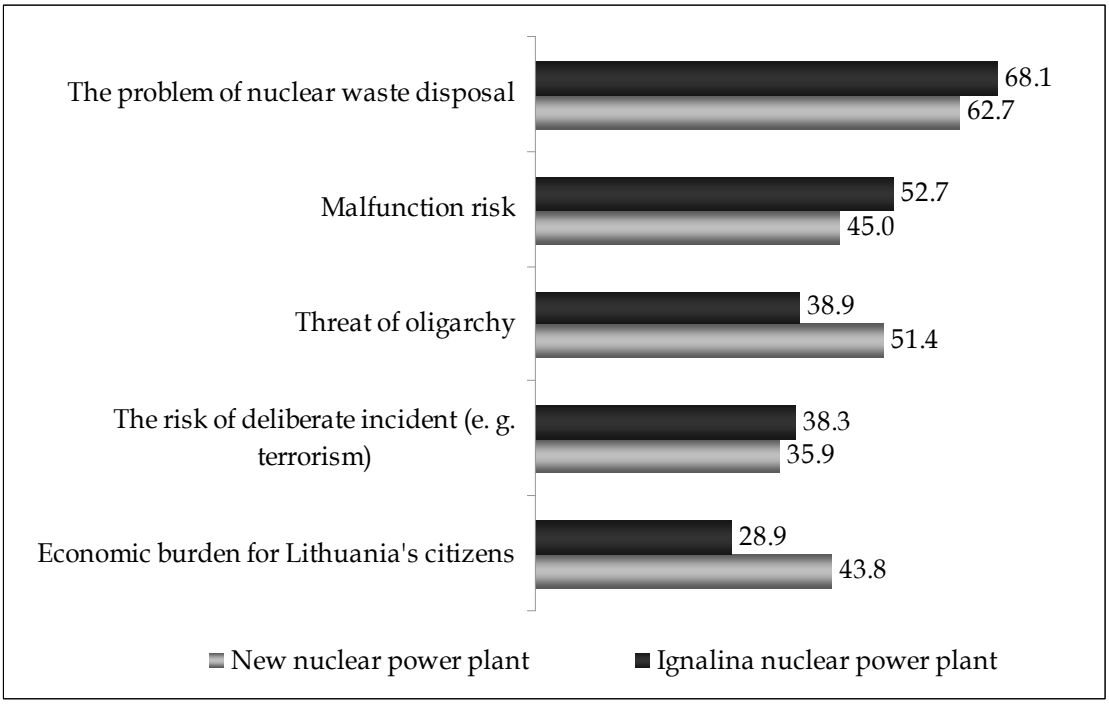

Figure 9 Percentage distribution of answers to the question: "*What does, in your opinion, the current Ignalina and new nuclear power plant mean for Lithuania?*" Ranking is based on "Totally agree" and "Tend to agree" results.

As the results indicate, the problem of nuclear waste disposal (68.1%, n=682) and the possibility of plants malfunctioning due to technical failures, human mistakes or natural disasters (52.7%, n=528) were pinpointed as being main concerns that diminish the perceived value of nuclear power. The threat of oligarchy (38.9%, n=389), the risk of deliberate incident (38.3%, n=383), and economic burden for Lithuania's citizens (28.9%, n=289) appeared among the minor issues affecting people's risk perceptions about nuclear power.

The breakdown of statements concerning the drawbacks of nuclear power by socio-demographic and risk perception factors revealed some patterns. Statistically significant differences were observed in males' and females' nuclear risk perceptions in all but one case regarding the threat of oligarchy (see Table 12 in Appendix 6). Females tended to agree more with the statements than male respondents did. This suggests that females are more risk averse compared to males.

The variable 'age' was weakly correlated with statements regarding economic burden for the citizens of Lithuania (Spearman's rho=0.075, $p<0.05$), as well as the threat of oligarchy (Spearman's rho=0.130, $p<0.01$). In the former case, 75+ year olds were more likely to associate the Ignalina nuclear power plant with economic burden than respondents between 25 and 55 years old. The results of the latter statement indicated a similar tendency: the age groups of 65–74 and 75+ statistically believed more in the threat of oligarchy than respondents aged between 18 and 44.

The results also revealed weak correlating relationships between education and the perceived risk of deliberate incident (Spearman's rho=0.066, $p<0.05$), as well as economic burden for the citizens of Lithuania (Spearman's rho=0.129, $p<0.01$). In both cases, higher educated respondents tended to regard the mentioned risks as irrelevant for the country than lower educated people.

The variable 'danger' significantly but weakly correlated with all the statements concerning the disadvantages of nuclear power (see Table 13 in Appendix 6). The positive relationship between the mentioned variables implies that the stronger the perceived danger, the higher the risk associated with nuclear power. The disadvantages of nuclear power emerged as significantly dangerous in all the cases.

Statistically significant negative relationships were detected between trust in science and technology and nuclear power risks regarding possible malfunctions (Spearman's rho=-0.181, $p<0.01$), deliberate incidents (Spearman's rho=-0.218, $p<0.01$), as well as the possible economic burden for the citizens of Lithuania (Spearman's rho=-0.151, $p<0.01$). Such relationship signifies that the higher the trust in science and technology, the lower the risks associated with nuclear power.

The comparison of Lithuanians' attitudes towards the risks reaching the mean of 3.4 and benefits associated with nuclear power (see the subsection 4.2.3) with the mean of 3.8 indicated that nuclear power is associated more with advantageous than with disadvantageous aspects. Thus, respondents seem to feel that the benefits of nuclear power slightly outweigh the risks it poses.

> To sum up, Lithuanians did not consider nuclear power as a very serious danger, and therefore its risks tended to be overshadowed by the benefits it provides to Lithuania. Nevertheless, the drawbacks of nuclear power commonly emerged behind Lithuanians' reluctance to support the technology due to the problems of nuclear waste disposal and malfunction risks. Women seemed to be especially prone to associate nuclear power with danger and potential risks, compared to men. Economic aspects of nuclear technology mostly worried the older generation and lower educated people. Finally, trust in science and technology to assure nuclear safety appeared to have a substantial impact on a lower extent of danger being associated with nuclear power.

4.2.4 Information on nuclear power

Besides Lithuanians' attitudes towards the benefits and risks of nuclear power, their interest in nuclear issues was examined. In addition to this, information sources and respondents' opinions about them were analysed with particular attention to the media.

The results indicate (see Table 14 in Appendix 6) that more than half (55.7%, n=557) of the respondents do not read popular science magazines that may provide a deeper insight into various technologies, nuclear power being one of them. Just 6.5% (n=65) of the interviewed people were regular readers of

these information sources. A similar tendency was observed in the analysis of commonly watched TV programmes (see Figure 10). Science-related programmes and documentaries were not very popular among Lithuanians. The society is thus not very keen on science and technologies.

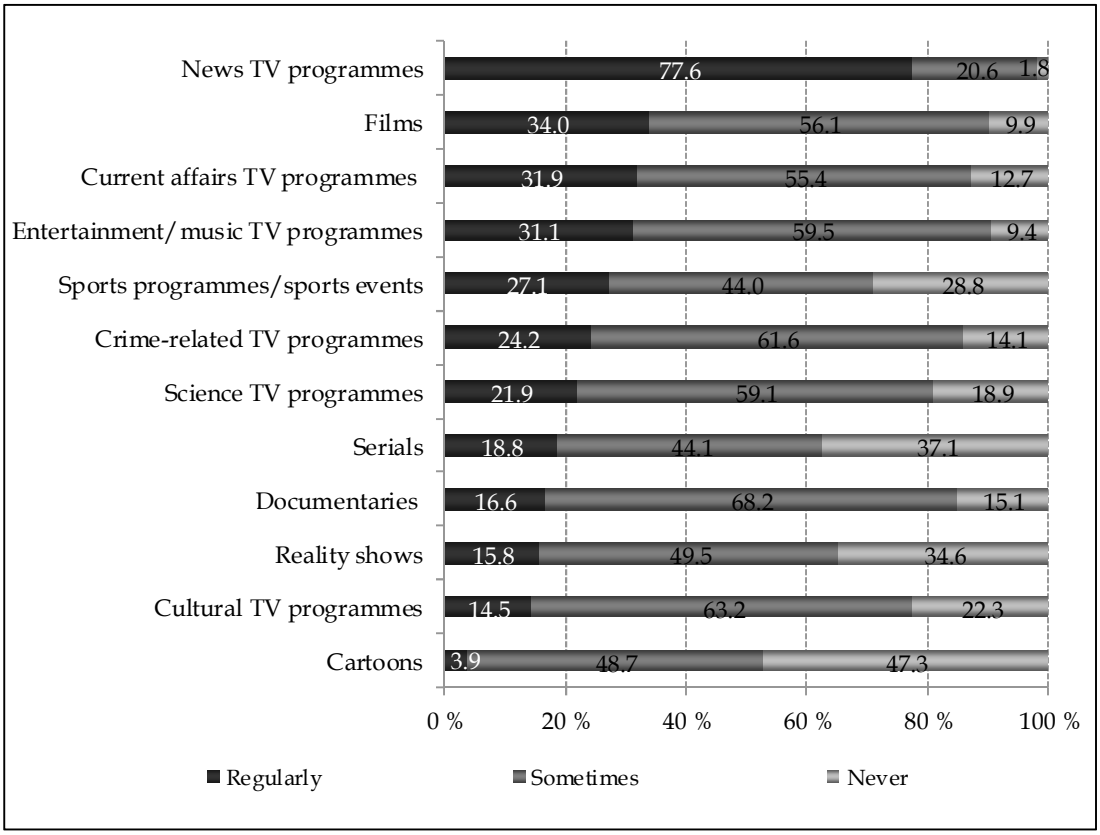

Figure 10 Percentage distribution of answers to the question: "*What TV programmes do you commonly watch?*"

The results in Figure 11 show that Lithuanians consider state institutions as being the most important sources of information about ecological problems that simultaneously raise the ecological consciousness of the society. State health care institutions (74.7%, n=747) as well as state environmental institutions (72.6%, n=726) were ranked as the most valued information sources. They were followed by national media (67.0%, n=670), as well as science and education institutions (63.8%, n=638).

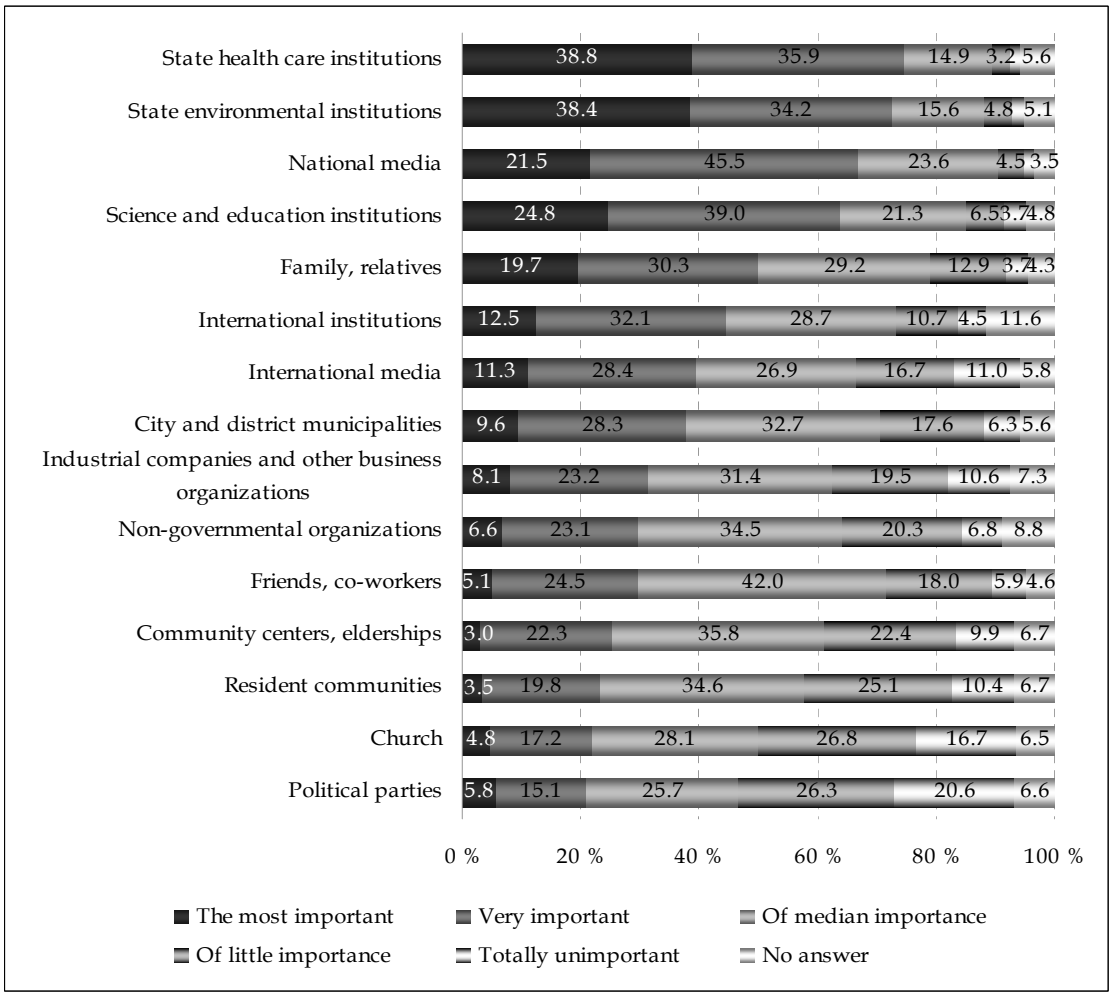

Figure 11 Percentage distribution of answers to the question: "*What are the most important institutions for you in the sense of informing about acute ecological problems and raising ecological consciousness?*" Ranking is based on "The most important" and "Very important" results. Values below 3% are not indicated in the figure.

Further analysis regarding the use of media indicated that television with the mean of 4.1 (while 1 denotes "Never" and 5 – "Very frequently") is the most significant source of information about nuclear power among Lithuanians (see Figure 12). People say that they gain less knowledge about the issue from radio (M=3.3) or newspapers (M=3.2). Magazines (M=2.4) as well as the Internet (M=2.2) appeared to be the least used media sources.

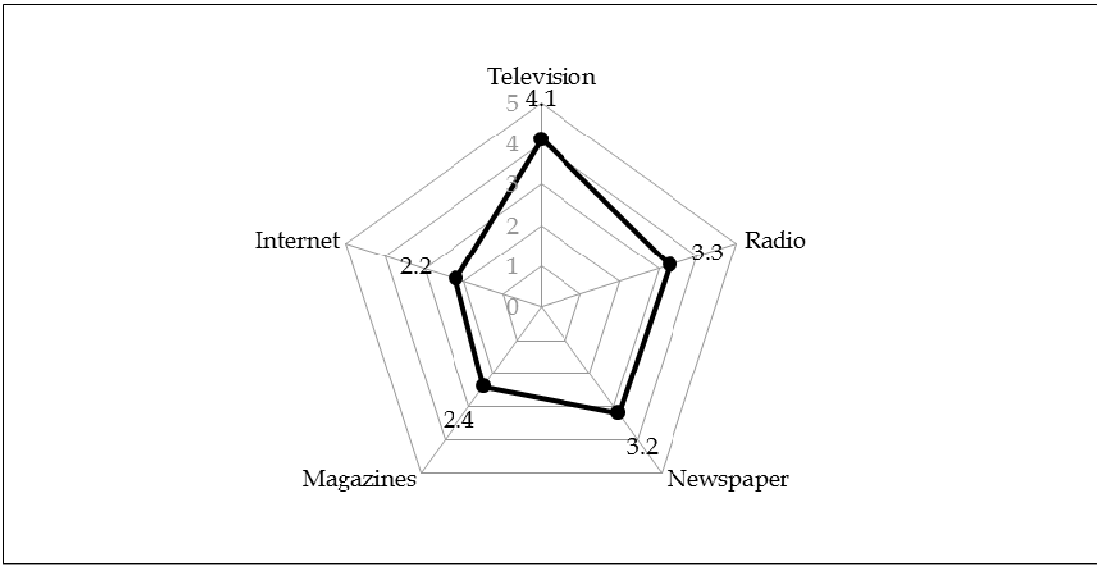

Figure 12 Distribution of means regarding the answers to the question: "*How often do you use these media technologies in order to gain information about nuclear power?*"

What characteristics Lithuanians attribute to the national media are illustrated in Figure 13. The results show that there were no prominent features ascribed to the media. Nevertheless, the media was assumed somewhat interesting (M=3.2), of good quality (M=3.3) and democratic (M=3.2) but at the same time it was characterised more as pulp (M=2.9), corrupted (M=2.8) and sensational (M=2.5).

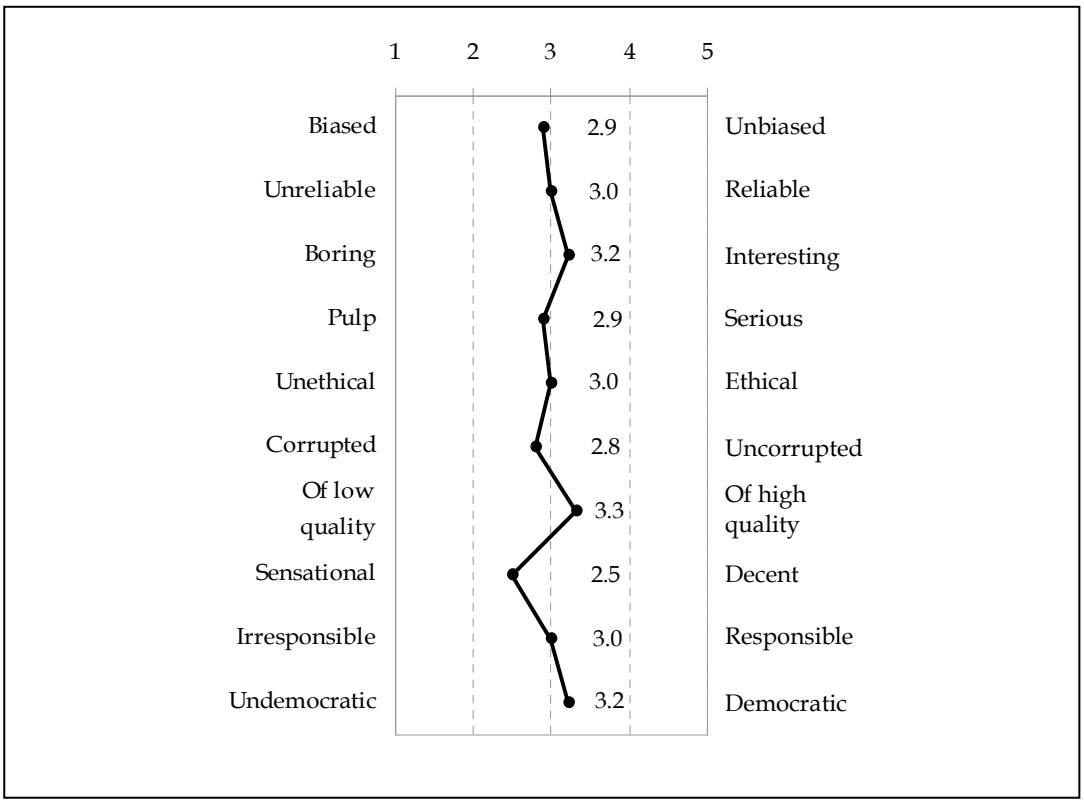

Figure 13 Distribution of means regarding the answers to the question: "*What is your opinion of the media of Lithuania?*"

Percent distribution of Lithuanians' opinions on the news about nuclear power provided in the media is presented in Figure 14. The results show that 48.6% (n=486) of the respondents thought that the media underestimate the seriousness of the nuclear power issue. 32.5% (n=325) believed that the media present a truthful picture of the technology, while only 17.6% (n=176) claimed that the nuclear issues are exaggerated.

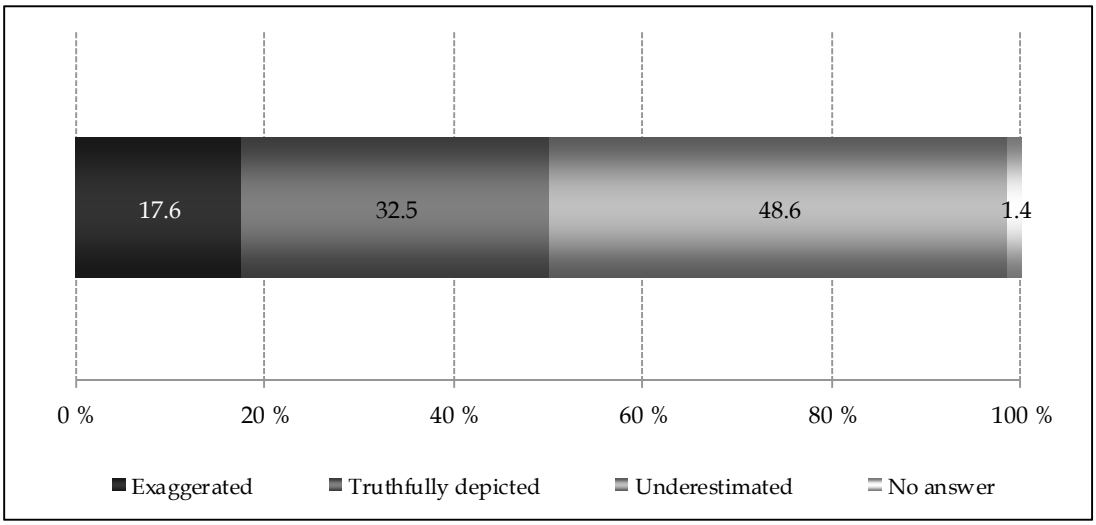

Figure 14 Percentage distribution of answers to the question: "*What is your opinion on the news about nuclear energetics provided in the media?*"

> In sum, Lithuanians appeared to have no particular interest in science and technologies. This suggests that they are not very keen on finding more in-depth information about nuclear power issues either. State institutions and the national media turned out to be the most important sources of information regarding this technology. Although the media were quite neutrally characterised, the respondents felt that they underestimate the seriousness of the nuclear power issue.

4.2.5 Attitudes towards public involvement

The focus of this subsection is on citizens' general activity and willingness to participate in nuclear decision-making processes. Additionally, the public's perceptions about the institutions related to nuclear development and safety issues in Lithuania is examined.

The results showed that the most actively citizens vote in elections (68.7%, n=688), devote two or more percents of their income-tax to non-governmental organizations (24.3%, n=243) or discuss political and societal issues with friends, neighbours or co-workers (16.9%, n=169). The general activity of Lithuanians is presented in Appendix 6 Table 15.

The perceived need for a referendum where citizens of Lithuania could express their opinions about the building of a new nuclear power plant was also measured in hopes of revealing how willingly the public would participate in a nuclear decision-making process. As shown in Figure 15, 48.2% (n=482) of the respondents considered that a referendum is needed, while 51.8% (n=518) had the opposite viewpoint or no opinion at all on this matter.

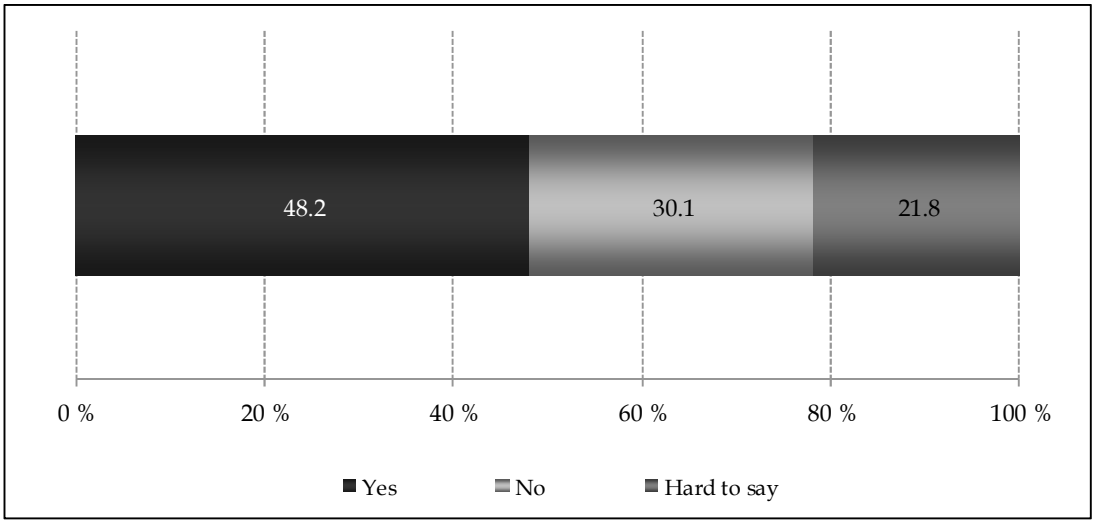

Figure 15 Percentage distribution of answers to the question: "*Is, in your opinion, a referendum regarding a new nuclear power plant building in Lithuania necessary?*" Values below 3% are not indicated in the figure.

The results in Figure 16 indicate that 93.7% (n=937) of the respondents think that nuclear development and safety questions should be the concern of scientists. Such political organizations at the national and international level as the government of Lithuania (91.0%, n=910), the parliament of the country, Seimas, (82.9%, n=829), and the European Union (84.2%, n=842) were also seen as responsible for nuclear power issues. Non-governmental organizations (45.4%, n=454) and the society (44.1%, n=441) were regarded as the least responsible for nuclear power development and safety.

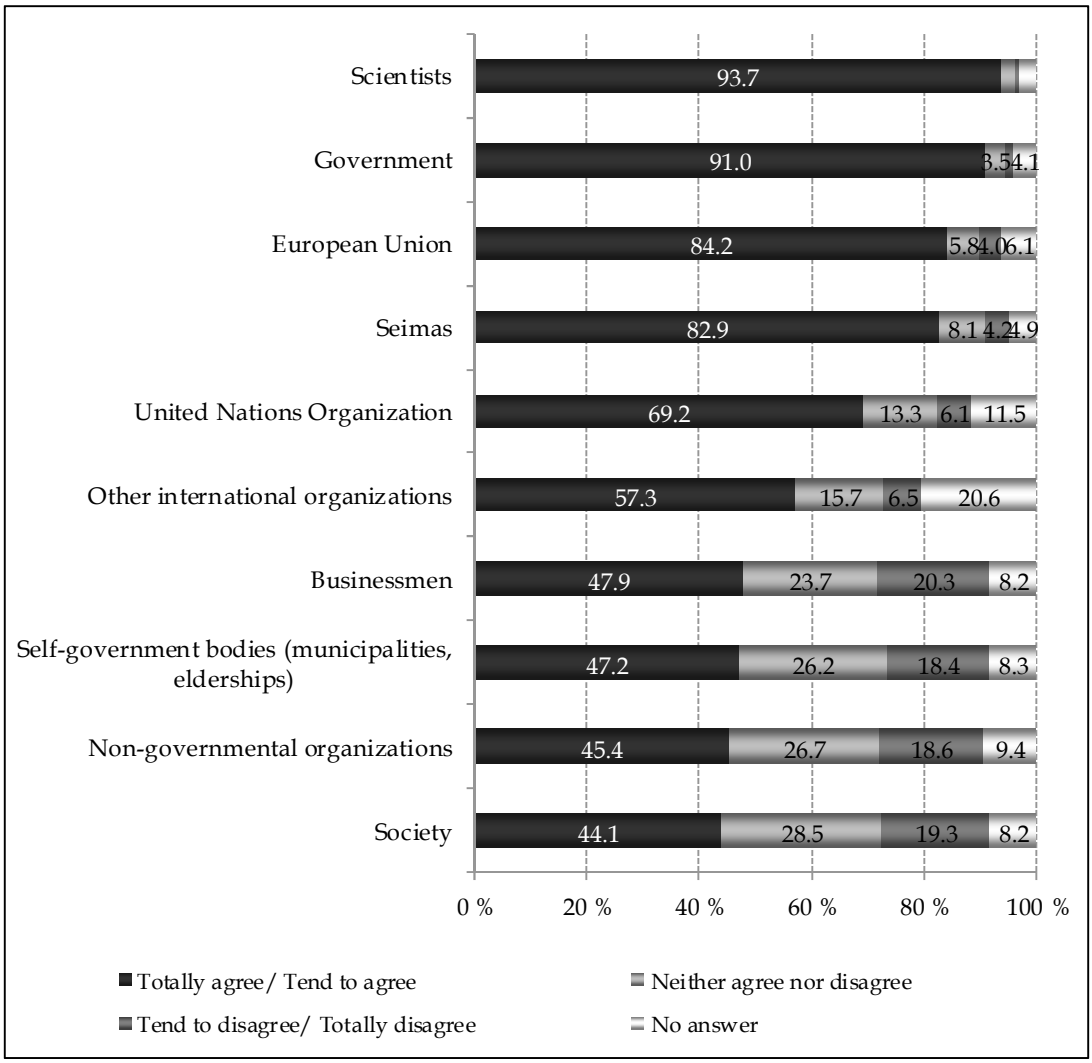

Figure 16 Percentage distribution of answers to the question: "*Who, in your opinion, should take care of nuclear development and safety questions?*" Values below 3% are not indicated in the figure.

The results in Figure 17 indicate that over half (53.8%, n=538) of the respondents trusted science and technology to guarantee nuclear safety. However, about every third of the interviewed people did not express their clear viewpoint on the matter. Lithuanians' perceptions about scientists' role in nuclear power development and safety issues solving weakly correlated (Spearman's rho=0.193, $p<0.01$) with associated trust. This suggests that the more people trust in science and technology, the more they rely on scientists' ability to solve nuclear power development and safety problems.

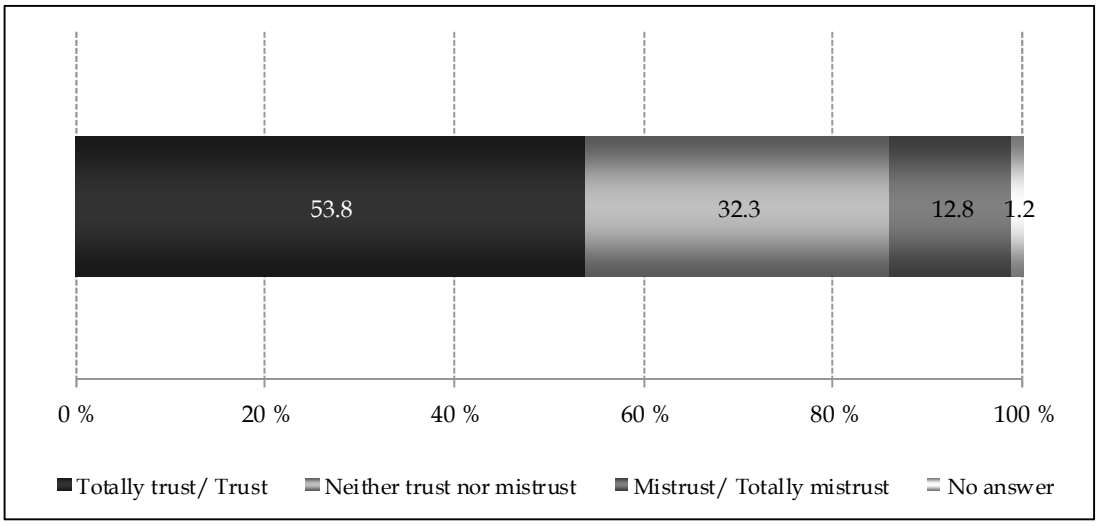

Figure 17 Percentage distribution of answers to the question: "*How much do you trust in contemporary science and technology to ensure nuclear safety?*"

In short, trust in science and technology explains why Lithuanians significantly rely on scientific institutions in nuclear development and safety management. National and international political organizations were also assumed to be responsible for nuclear issues. However, the results suggest that people seem to delegate such responsibilities to the involved organizations to avoid participation and involvement in decision-making processes.

4.2.6 Cultural background

The cultural background of the Lithuanians was evaluated on the basis of their values measured on the grounds of perceived similarity to other people, general evaluation of the Lithuanian society, as well as the most important matters for them.

The results in Figure 18 indicate that most of the respondents are similar to individuals who have strong bonds with family (93.2%, n=931), comply with traditions and customs (84.6%, n=845), and protect nature (81.0%, n=809). The respondents have little in common with those, who live an exciting life with adventures and risks (21.0%, n=210), are leaders (31.4%, n=313) or seek to show off their achievements (35.7%, n=357).

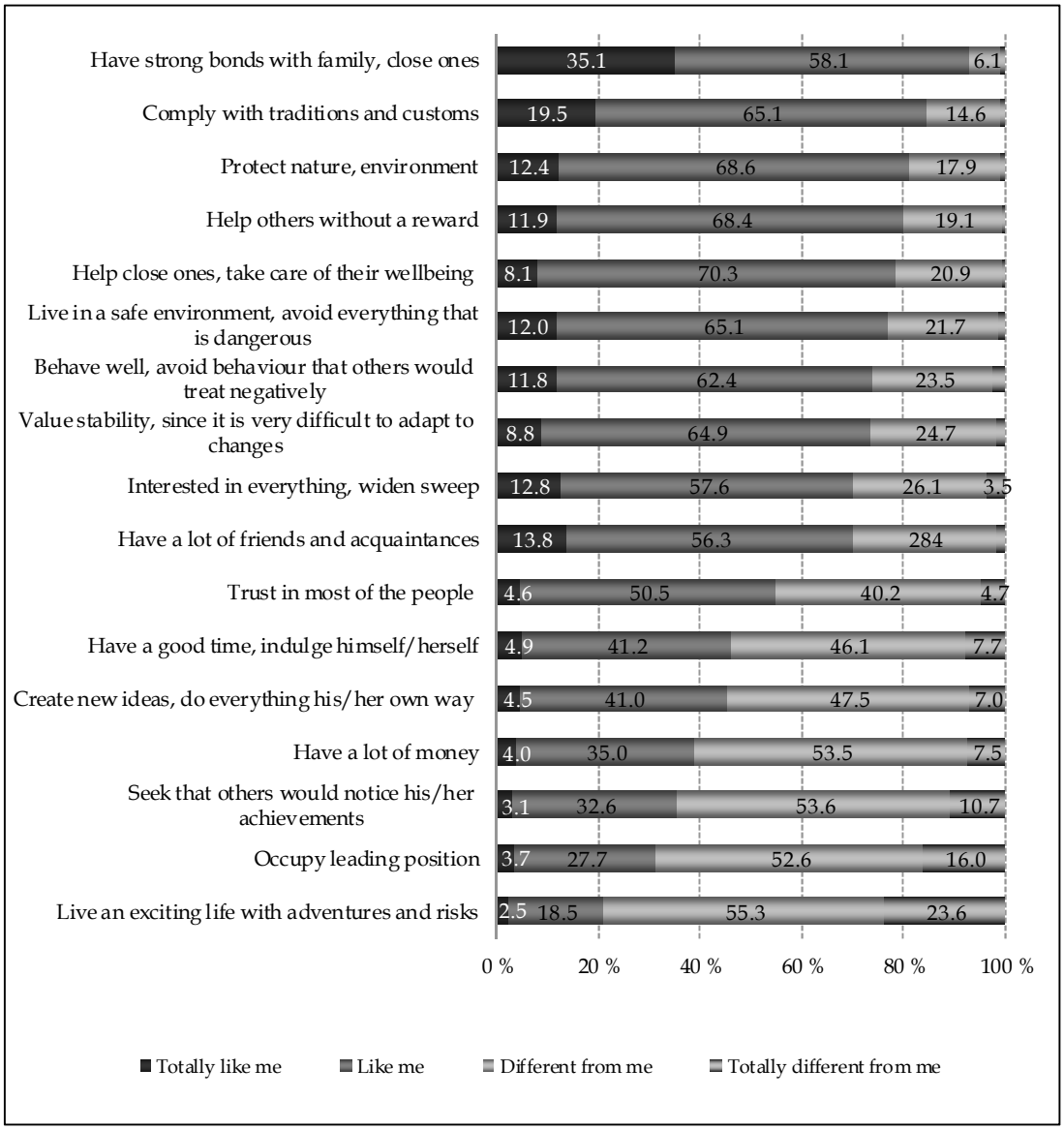

Figure 18 Percentage distribution of answers to the question: "*Which of the following people are like you?*" Ranking is based on "Totally like me" and "Like me" results. Values below 2.5% are not indicated in the figure.

A more general analysis regarding the characteristics of Lithuanian society as illustrated in Figure 19 shows that there are no outstanding features. However, Lithuanian society was described as somewhat more democratic (M=2.9) and nonconformistic (M=2.8), with prevailing passiveness (M=2.4), mistrust (M=2.4), individualism (M=2.4), as well as tight bonds (M=2.4) between people.

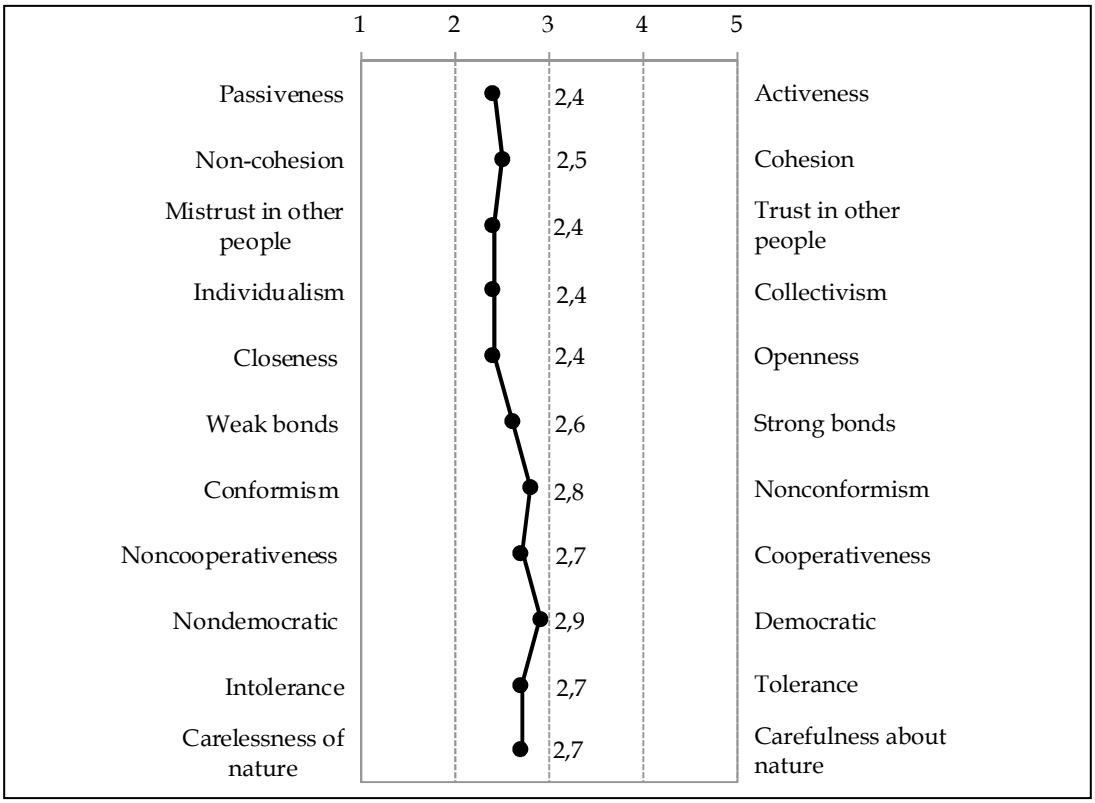

Figure 19 Distribution of means regarding the answers to the question: "*What features, in your opinion, characterize Lithuanian society?*"

The answers to the question "*If you could choose, what would be the most important matter for you?*" show (see Figure 20) that the most important matters for the respondents were related to such material aspects as the fight against inflation (31.9%, n=619) and stable economics (27.1%, n=525). Assurance of the freedom of speech (1.8%, n=35) and development towards a society where ideas are more appreciated than money (1.8%, n=35) appeared to be of less importance for Lithuanians.

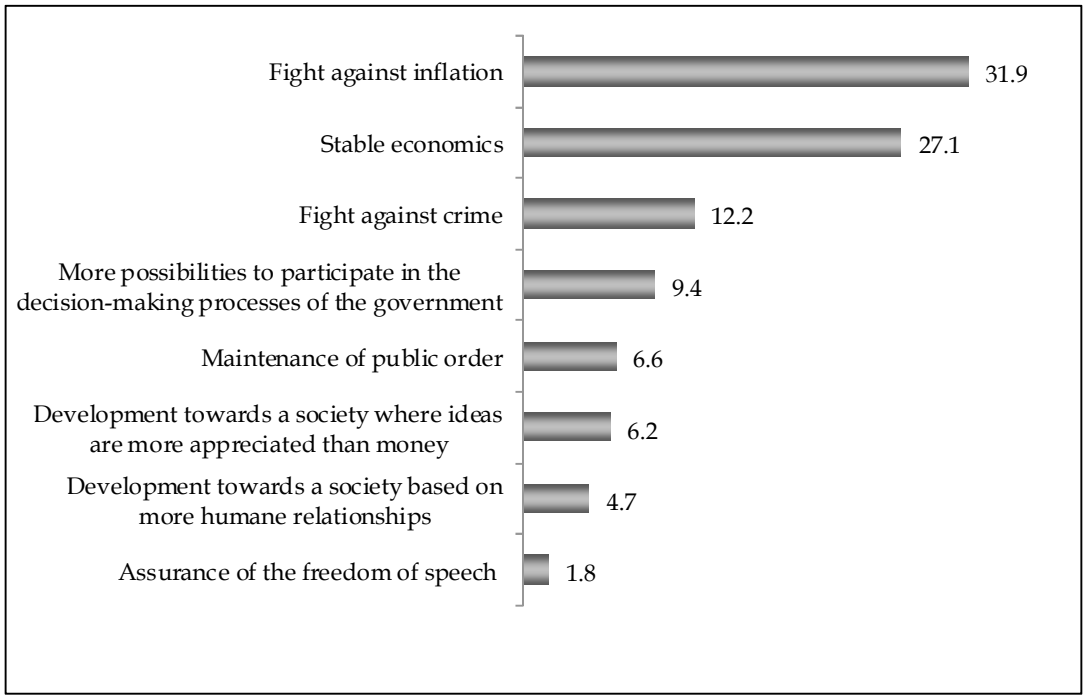

Figure 20 Percentage distribution of answers to the question: "*If you could choose, what would be the most important matter for you?*"

In sum, Lithuanians appeared to adhere to traditional values with traditions, nature and family, as well as economic security being the most important priorities in their lives.

4.2.7 Overview of quantitative findings

The main findings of the quantitative study focusing on Lithuanians' risk perceptions regarding nuclear power are overviewed in this subsection.

The findings suggest that Lithuanian society was more concerned about economic and social wellbeing issues than environmental problems. Therefore, economic-political aspects were pinpointed as being the most significant advantages of nuclear power. Although Lithuanians did not consider nuclear power as being a very serious danger, support of the future development of nuclear facilities in Lithuania was not dominant amongst citizens. The drawbacks of nuclear power commonly emerged behind Lithuanians' reluctance to support the technology.

The most significant sources of information about nuclear power were state institutions and the national media. Although the respondents believed that

the latter underestimates the seriousness of the nuclear power issue, they were not eager to gain more information about it from other sources which may provide an in-depth understanding of science and technology. Moreover, Lithuanians were not very interested in involvement with and participation in decision-making processes concerning nuclear power issues. They eagerly delegated the responsibilities to the academic community, as well as national and international political organizations. The quantitative study also suggests that Lithuanians relied more on traditional values than on hedonistic or post-modernistic ones.

Analyses on the grounds of demographic and risk perception factors disclosed relatively clear patterns dominating in risk perceptions of Lithuanian society. The demographic variable 'gender' appeared to have an especially significant impact on the conceptualization of nuclear technology. Men were more prone than women to support nuclear power's future development in the country, despite the risks this technology poses to people and environment. Furthermore, there were some differences in perception of nuclear issues between certain age groups, with the older generation being more risk averse than younger people. Educational background also seemed to determine the risk perceptions of Lithuanians. Better educated individuals tended to be in favour of nuclear power and its future development, with certain nuclear risks being regarded as irrelevant for the country.

Besides the demographic aspects, Lithuanians' perceptions were coloured by an attributed danger to nuclear power, as well as trust in science and technology to assure nuclear safety. These citizens did not consider nuclear power as a very serious danger, and therefore its risks tended to be somewhat overshadowed by the benefits it provides to the country. The substantial extent of trust associated with science and technology contributed to a greater acceptance of nuclear power and its future prospects in the country, and diminished the perceived extent of the potential risks of nuclear power.

5 DISCUSSION

The purpose of the present study was to investigate the risk communication of organizations, and risk perceptions of the public at large. The interrelationship of these domains was examined in the case study of the nuclear power debate in Lithuania. In the final section of this study, the main results are summarised and presented on the grounds of the theoretical framework. The evaluation of the study and some suggestions for future research are proposed before presenting the final conclusions.

5.1 Main results

The research questions addressing the intentions of the present study were as follows:

> RQ 1: *How do organisations in Lithuania communicate about nuclear power and related risks?*
> RQ 2: *How do Lithuanians perceive nuclear power?*

The first question sought to reveal the overall risk communication of Lithuanian organizations that are related to nuclear power. The results confirmed the assumption, formed on the basis of the overviewed literature, that overall risk communication of these organizations is cumulatively impacted by such dimensions as their positioning, risk communication strategy, practised involvement of the public, and attributed meaning to trust.

The investigated organizations' communication about nuclear power tended to correlate with the stand they occupy in the issue arena. In other words, their designated functions, expertise and status in Lithuanian society

appeared to determine their risk communication. Furthermore, the investigated organizations practised one-way communication, and there was no mutual dialogue between them and the public at large. The organizations strived to shape the risk perceptions of the citizens by disseminating information about nuclear power. To some extent, they did monitor the publics' perceptions, but they seemed to not apply this insight in their risk communication practice.

The investigation also indicated that currently, the public involvement in nuclear power decision-making processes is nothing more than the legal obligation for the organizations. However, some hints suggest that they might want to cooperate more with the public but such obstacles as, for instance, a lack of legal possibilities of involvement, or apathy of the general population hinder a more active mutual collaboration. Moreover, risk communication tended to be influenced by the meaning of trust for the investigated organizations. Although they attributed different connotations, it appeared to be a highly significant asset denoting the legitimacy to operate. The organizations clearly understood that risk communication, as well as corresponding actions, pave the way to mutually trustworthy relationships with society.

The second research question investigated Lithuanians' conceptualization of nuclear power. The results told that controversial perceptions of the public were shaped by numerous psychological, social and cultural aspects as literature on the issue suggests.

The heuristics of information processing of the citizens appeared to be guided by a primary need for safety that seemed to be closely interrelated with the demands of both physical and economic security. Knowledge about nuclear power, as well as contradicting feelings, also influenced Lithuanians' attitudes towards the technology. The results showed that the society was not very interested in nuclear issues. Therefore, most likely the level of its awareness about the technology is relatively low. As prior research on risk perception claim, unknown matters frighten. Emotions of the citizens tended to show a conflict between the tempting benefits and future prospects of nuclear power, and a dread associated with potential risks of the technology. On the one hand, the citizens pragmatically evaluated the pros and cons of nuclear power; however, on the other hand, they were anxious about their safety and wellbeing.

State bodies as well as the academic community were among the most trusted socio-political institutions in the nuclear power issue arena in Lithuania. They emerged as the most significant sources of information about the technology. The national media were also seen as an important medium between the institutions and the public at large, although the Lithuanians felt that they somewhat underestimate the seriousness of nuclear issues. Moreover, the citizens eagerly delegated the responsibility of nuclear development and safety question-solving for the substantially trusted scientists, and national and international political organizations.

Lithuanians saw nuclear issues through the lenses of their cultural background, with a domination of traditional values over hedonistic and post-modernistic ones. They were more concerned about material issues guaranteeing safety and stability, but not matters related to self-expression and realisation. Additionally, Lithuanian society emerged as somewhat passive and closed, with a prevailing individualism and mistrust among the members of society.

The results of the present study were embedded in the methodological model of risk communication and risk perception, summarizing the major conclusions of the study (see Figure 21). The absence of mutual dialogue between organizations and the public at large in the nuclear power issue arena in Lithuania was illustrated with vertical (instead of horizontal) arrows, signifying a top-down influence of risk communication to risk perceptions of the public at large.

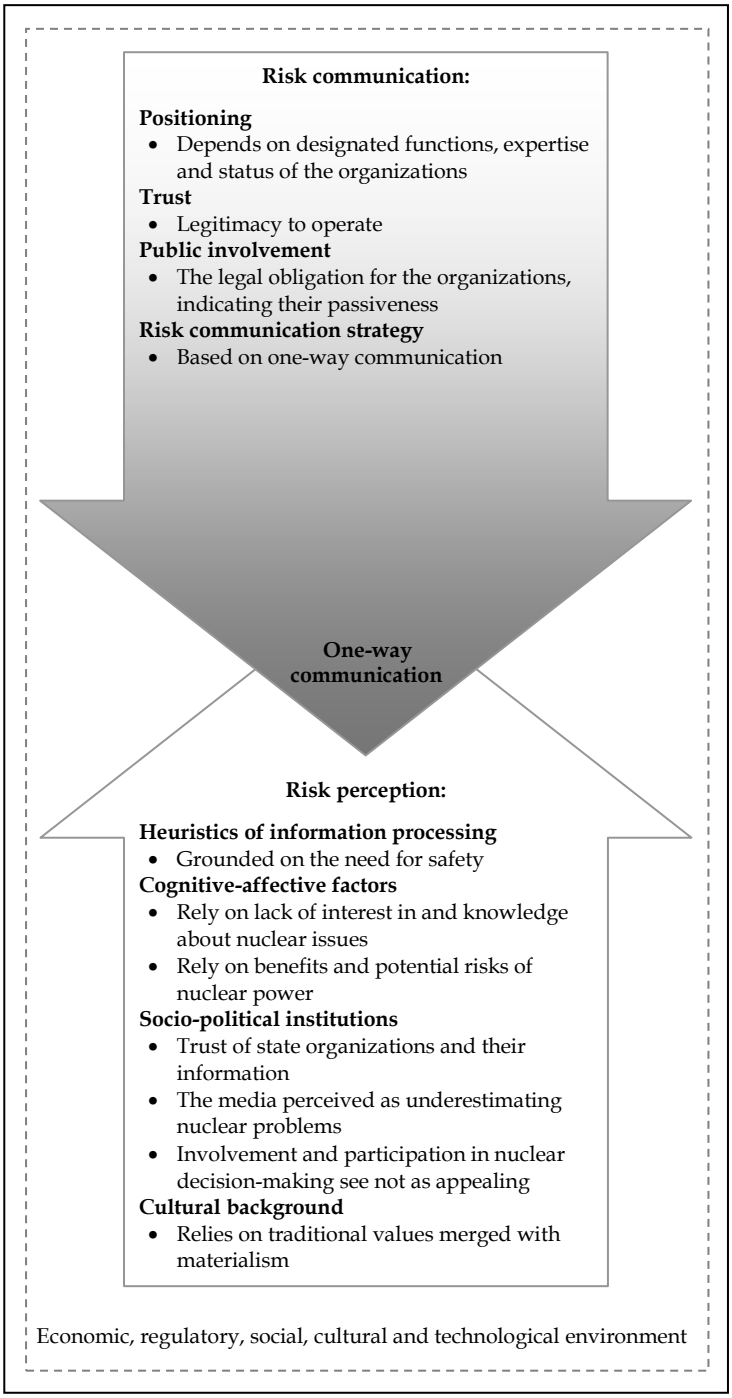

Figure 21 The methodological model of risk communication and risk perception with the major conclusions of the study.

5.2 Evaluation of the study and its data

With a focus on the risk communication of organizations, and the risk perceptions of the public, the present study analysed the nuclear power

debate in Lithuania. A great deal of overviewed literature provided the grounds for the methodological model of risk communication and risk perception that guided the empirical research of the study.

The empirical investigation was based on a content analysis of qualitative data concerning risk communication of the target organizations, as well as statistical research of a quantitative data set related to risk perceptions of the public. The qualitative study provided a substantial amount of flexibility for the researcher, in terms of approaches and methodology, impacting the analysis and interpretation of the data. As the qualitative material was rather small, the results cannot be generalized to other organizations.

The examination of the quantitative material was based on the secondary data analysis. The use of readily available statistical data collected by others and for other purposes restricted the formation of research questions and the methodological choices of the present study, as well as to some extent constrained the analysis of the data. Despite the limitations, this choice was made because of the large high-quality database with a pre-established degree of validity and reliability that would be unfeasible for the researcher to gather on her own.

As a native of Lithuania, the researcher of the present study used her insights, knowledge and experience while analysing and interpreting data related to the Lithuanian context and culture. In order to avoid possible bias, the researcher relied on tendencies and facts emerging from the study material, and did not express her own opinion about examined issues.

The combined research on risk communication and risk perceptions was original and therefore fruitful in respect of the results. The Lithuanians' risk perceptions about nuclear power have been substantially examined, and the findings of the present study seem not to contribute anything striking. However, with previously unstudied risk communication of Lithuanian organizations, this study revealed new perspectives in both fields, and offered a framework for future research.

5.3 Suggestions for future studies

The present study has only scratched the surface of such complex phenomena as risk communication and risk perception. Therefore, further research on these subjects is needed.

As risk communication of organizations was scrutinized on the basis of a small sample in this study, it is not possible to generalize the results and draw firm conclusions. A qualitative or even a quantitative study with a wider range of communicators about nuclear power and/or other risks could provide a better insight into the matter. Meanwhile, future research on risk perceptions of the public at large could focus on longitudinal studies of public responses to nuclear power and other risks, enabling researchers to detect possible attitudinal changes.

Finally, it would be interesting to test in more detail the methodological model of risk communication and risk perception that was constructed for the purpose of the present study. Future research could yield other significant dimensions that were not taken into account in this study.

5.4 Conclusion

The present study focusing on risk communication and risk perception exhibits a great complexity of both domains that are mutually interrelated and context-bonded phenomena. The results show that the present study is consistent with other research claiming that risk communication should be guided by the risk perceptions of the public at large. However, how to communicate about risks while knowing the risk perceptions of the public?

According to prior literature, risk communication should be a continuous dialogue with a mutual exchange of information between risk professionals and the public, as well as active participation and trustworthy relationship building. As beliefs about nuclear power are both subtle and complex in Lithuanian society without any clear support or rejection of the technology, there would be a need for extensive and meaningful dialogue among involved parties. However, this seems a hardly achievable goal, as there are still no required legal possibilities, as well as an initiative from the public at large. Therefore, for the time being, organizations should strive for at least a

proactive risk communication that could possibly develop into a dialogue in the future.

Planning, implementation and evaluation of risk communication efforts should be based on the concerns of the public. In the case of Lithuania, the most worrying issues related to economic and social wellbeing should be particularly highlighted while communicating about nuclear power and related risks.

Risk communication should be tailored according to the needs of various public groups. As the present study disclosed, there are certain clusters of people in respect of their gender, age and educational background holding certain perceptions which should be separately addressed when communicating about nuclear issues.

While communicating about risks, organizations should also keep in mind the importance of mutual trust. This intangible asset not only provides the grounds for the legitimacy of risk initiating and managing organizations, but also gives confidence to an anxious society that risks are and can be controllable. In the case of Lithuania where scientists enjoy the highest extent of trust, organizations could cooperate more with the academic community, as well as stress this collaboration in their risk communication.

In short, effective risk communication has a major bearing on how people perceive and handle risks. Therefore, it is of crucial importance for contemporary society living with constantly developing technologies and their inherent risks and hazards.

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APPENDICES

Appendix 1 Field of forces concerning nuclear power issue arena in Lithuania

Figure 22 illustrates the field of forces concerning nuclear power issue arena in Lithuania. Like any other risk debate, discussion about nuclear power in this Baltic state focuses on two issues: what is an acceptable level for nuclear risk, and how equally risks and benefits are distributed in society (Renn 2008, 133). The debate takes place in the economic, regulatory, social, cultural and technological context of the country, with numerous local, national and even international actors having an impact on its progress.

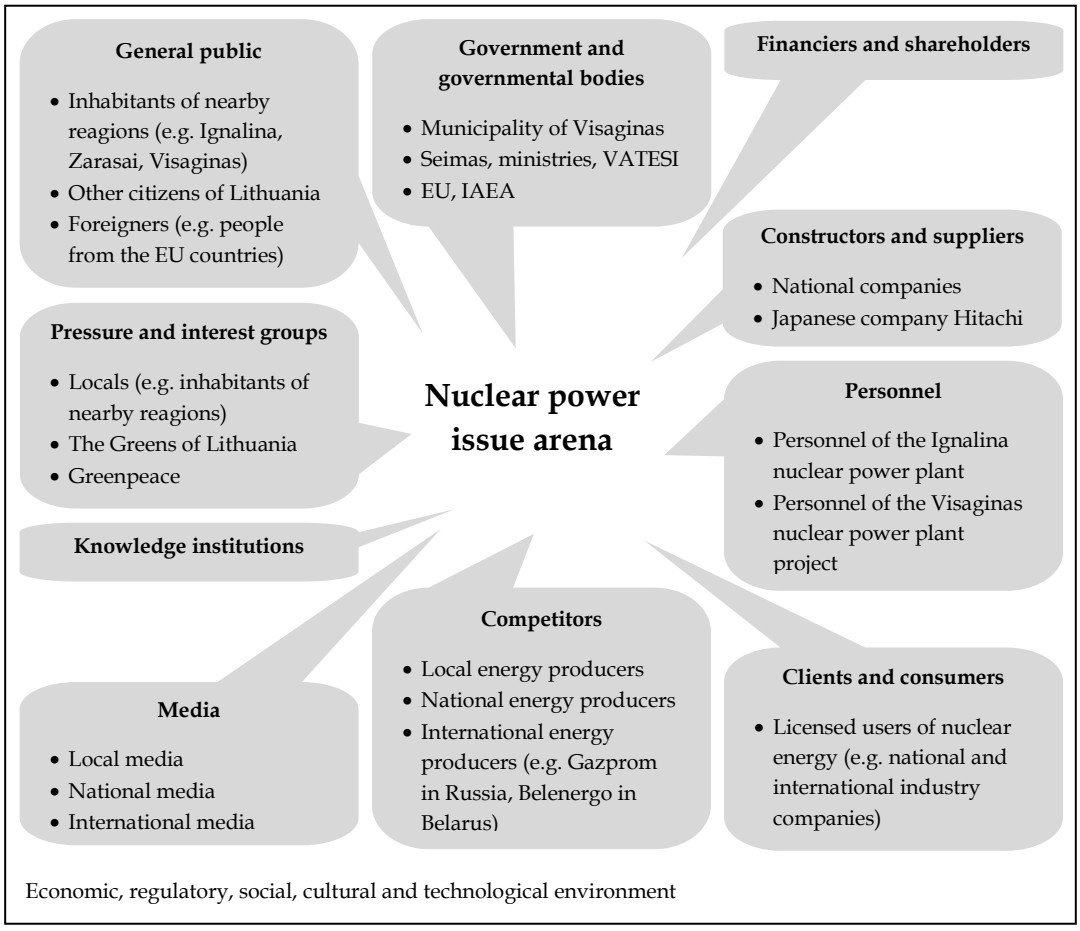

Figure 22 Field of forces concerning nuclear issue arena in Lithuania.

The involved parties use such resources as power, money, social influence, value commitment, and evidence, providing the means to achieve their goals

in the risk arena (Renn 2008, 130–131). With power, or a legal right to impose decisions on others (ibid.), the Lithuanian government and other national and international institutions coordinate the processes of interaction and negotiation among involved parties, control the debate about nuclear power, and make final decisions. These organizations are sought to be impacted by other actors through public pressure and/or evidence.

The money of financiers and shareholders provides opportunities for the development of nuclear power initiatives with the help of constructors and suppliers, as well as the personnel of the Ignalina nuclear power plant and the Visaginas nuclear power plant project. Moreover, financial compensations help to gain support from certain societal groups (e.g. inhabitants of nearby regions, lobbyers of clients, customers or competitors).

Local, national and international media observe, interpret the actions of other actors of the issue arena, and use social influence while transmitting their reports to the public at large. Social influence is also a "weapon" of the public at large that may strive to influence other actors through solidarity. Knowledge institutions (e.g. Vilnius Gediminas Technical University with the Department of Physics, which focuses on nuclear power), pressure and interest groups (e.g. the Greens of Lithuania) rely on evidential resources to help in informing others about the likely consequences of their actions (ibid.), as well as value commitment aiding to induce support through persuasion and trust (ibid.).

Appendix 2 Questionnaire for target organizations in English

1. Which energy generation technologies should be developed in Lithuania?
2. How important nuclear power issue is in the agenda of your organization?
3. What is your organization's role in nuclear power debate?
4. How nuclear safety is related to your organization?
5. Does Lithuania need a new nuclear power plant? Why?
6. What are the advantages of nuclear power for Lithuania?
7. What are the disadvantages of nuclear power for Lithuania?
8. From your organization's point of view, are advantages of nuclear power outweighing the disadvantages or not?
9. Is referendum regarding building a new nuclear power plant needed in Lithuania? Why?
10. What Lithuanian society thinks about nuclear power? Is it exaggerating, underestimating or perceiving correctly nuclear power and related risks?
11. Could you describe what kind of communicator your organization is in Lithuanian society?
12. Who is responsible for communication in your organization?
13. How does your organization reach the public when communicating about nuclear power?
14. Which of your mentioned ways of communication are the most important for your organization while communicating with the public about nuclear power? Why?
15. Does your organization communicate directly to the society or involved parties (e.g. the inhabitants of Visaginas) about nuclear power? If yes, how?
16. How does your organization involve society or interested parties in nuclear power decision making process?
17. How does your organization monitor and study the public opinion about nuclear power?
18. How does the feedback and opinions of the public impact decision making about nuclear power in your organization?
19. How well is the Lithuanian society informed about nuclear power?
20. Which nuclear power and people risk perception research is your organization aware of? How these studies impact your organization's activities and communication with the public?
21. How would you describe your organization in four words? Motivate your choice.

22. How Lithuanian society evaluate your organization's activities regarding nuclear power?
23. What trust of the public means to your organization?
24. How does your organization seek trust regarding nuclear power?
25. What is your status in the organization you are working in?
26. How many employees work in your organization?
27. How many employees are responsible for the communication and public relations of the organization?

Appendix 3 Questionnaire for target organizations in Lithuanian

1. Kokias energijos gamybos technologijas reikėtų vystyti Lietuvoje?
2. Koks svarbus atominės energetikos klausimas yra Jūsų institucijos darbotvarkėje?
3. Kokia yra Jūsų institucijos rolė atominės energijos diskusijoje?
4. Kaip atominės energijos saugumo užtikrinimas yra susijęs su Jūsų institucija?
5. Ar Lietuvai reikia naujos atominės elektrinės? Kodėl?
6. Kokie yra atominės energijos privalumai Lietuvai?
7. Kokie yra atominės energijos trūkumai Lietuvai?
8. Jūsų institucijos požiūriu, atominės energijos privalumai atsveria trūkumus ar ne?
9. Ar reikalingas referendumas dėl naujos atominės jėgainės statymo Lietuvoje? Kodėl?
10. Ką Lietuvos visuomenė mano apie atominę energiją? Ar ji sureikšmina, nepakankamai įvertina ar teisingai supranta atominę energiją ir su ja susijusią riziką?
11. Koks kalbėtojas visuomenėje yra Jūsų institucija?
12. Kas yra atsakingas už komunikaciją Jūsų institucijoje?
13. Kaip Jūsų institucija pasiekia visuomenę komunikuodama apie atominę energiją?
14. Kuri iš Jūsų išvardytų visuomenės informavimo priemonių yra svarbiausia Jūsų institucijai komunikuojant apie atominę energiją visuomenei? Kodėl?
15. Ar Jūsų institucija bendrauja tiesiogiai su visuomene ar suinteresuotomis grupėmis (pvz., Visagino gyventojais) apie atominę energiją? Jei taip – kaip?
16. Kaip Jūsų institucija įtraukia visuomenę ar suinteresuotas grupes į sprendimų, susijusių su atomine energija, priėmimo procesą?
17. Kaip Jūsų institucija seka ir analizuoja visuomenės nuomonę apie atominę energiją?
18. Kokią įtaką Jūsų institucijai daro visuomenės atsiliepimai ir nuomonės priimant sprendimus susijusius su atomine energija?
19. Kaip gerai Lietuvos visuomenė yra informuota apie atominę energiją?
20. Su kokiomis studijomis, susijusiomis su atomine energetika ir žmonių požiūriu į šią technologiją, yra susipažinusi Jūsų institucija? Kaip tyrimai daro įtaką Jūsų institucijos veiklai ir bendravimui su visuomene?

21. Kokie keturi žodžiai geriausiai apibūdina Jūsų instituciją? Motyvuokite pasirinkimą.
22. Kaip Lietuvos visuomenė vertina Jūsų institucijos veiklą, turint omeny atominę energiją?
23. Ką visuomenės pasitikėjimas reiškia jūsų institucijai?
24. Kaip Jūsų institucija siekia visuomenės pasitikėjimo, turint omeny atominę energiją?
25. Kokias pareigas užimate?
26. Kiek darbuotojų Jūsų organizacijoje?
27. Kiek darbuotojų yra atsakingi už komunikaciją ir ryšius su visuomene?

Appendix 4 Survey questionnaire of the RISICUS study in English

Questions related to climate change and genetically modified organisms are excluded, as they are not relevant for the present study. However, all other questions are presented here, whether they were analysed in this study or not. Numbering of the questions is the same as in the raw material of RISICUS study. Researcher's comments are written in angle brackets.

1. What, in your opinion, is the most relevant problem in Lithuania? [*A Likert scale question with a scale from 1 to 6, with (1) corresponding to "Very important" and (5) "Very unimportant", as well as (6) "Hard to say".*]

1) AIDS
2) Alcoholism
3) Unemployment
4) Bureaucracy
5) Household waste
6) Emigration
7) Energy dependence
8) Lack of democracy
9) Increase in prices
10) Road safety
11) Climate change
12) Corruption
13) Criminal offence
14) Drug addiction
15) Air pollution
16) International terrorism
17) Water pollution
18) Oligarchy
19) Poverty
20) Other problems

2. What of previously mentioned problem is, in your opinion, the most relevant in Lithuania? [*A Likert scale question with a scale from 1 to 6, with (1) corresponding to "Very important" and (5) "Very unimportant", as well as (6) "Hard to say".*]

1) AIDS
2) Alcoholism
3) Unemployment
4) Bureaucracy
5) Household waste
6) Emigration
7) Energy dependence
8) Lack of democracy
9) Increase in prices
10) Road safety
11) Climate change
12) Corruption
13) Criminal offence
14) Drug addiction
15) Air pollution
16) International terrorism
17) Water pollution
18) Oligarchy
19) Poverty
20) Other problems

3. How dangerous are the issues related to science and technology development, as well as human health and environment? *[A Likert scale question with a scale from 1 to 6, with (1) corresponding to "Very dangerous" and (5) "Not dangerous at all", as well as (6) "Hard to say".*]

1) Abortion
2) Nuclear energy
3) Plant and animal cloning
4) Artificial insemination
5) Euthanasia
6) Cattle rabies
7) Genetically modified organisms
8) Disappearance of species
9) Climate change
10) Food preservatives and additives
11) Bird flu pandemic
12) Organ donation
13) Depletion of ozone layer
14) Human cloning

4. What are the most important institutions for you in the sense of informing about acute ecological problems and raising ecological consciousness? [*A Likert scale question with a scale from 1 to 6, with (1) corresponding to "The most important" and (5) "Totally unimportant", as well as (6) "Hard to say".*]

1) International institutions
2) Church
3) Community centers, elderships
4) Friends, co-workers
5) Resident communities
6) National media
7) International media
8) Science and education institutions
9) City and district municipalities
10) Non-governmental organizations
11) Political parties
12) Industrial companies and other business organizations
13) Family, relatives
14) State environmental institutions
15) State health care institutions
16) Other institutions

5. What do you think about the statement claiming that a new modern nuclear power plant building is essential for Lithuania?

1) Totally agree
2) Tend to agree
3) Neither agree nor disagree
4) Tend to disagree
5) Totally disagree
6) Hard to say

6. What do you think about the statement claiming that there is no need to build a new nuclear power plant in Lithuania, since the energy demand of the state may be supplied by other energy sources?

1) Totally agree
2) Tend to agree
3) Neither agree nor disagree
4) Tend to disagree
5) Totally disagree
6) Hard to say

7. What does, in your opinion, the Ignalina nuclear power plant mean for Lithuania? [*A Likert scale question with a scale from 1 to 6, with (1) corresponding to "The most important" and (5) "Totally unimportant", as well as (6) "Hard to say"*.]

1) Lithuanian economic self-sufficiency
2) Malfunction risk
3) The risk of deliberate incident (e.g. terrorism)
4) Lithuanian energy independence
5) Economic burden for Lithuania's citizens
6) The problem of nuclear waste disposal
7) Lithuanian national security
8) Threat of oligarchy
9) Lithuanian contribution to limit climate change
10) Other

8. What does, in your opinion, a new nuclear power plant mean for Lithuania? [*A Likert scale question with a scale from 1 to 6, with (1) corresponding to "Totally agree" and (5) "Totally disagree", as well as (6) "Hard to say"*.]

1) Lithuania economic self-sufficiency
2) Malfunction risk
3) The risk of deliberate incident (e.g. terrorism)
4) Lithuanian energy independence
5) Economic burden for Lithuania's citizens
6) The problem of nuclear waste disposal
7) Lithuanian national security
8) Threat of oligarchy
9) Lithuanian contribution to limit climate change
10) Other

9. What do you think about the statement claiming that a new nuclear power plant should be built and managed by the state without private share capital?

1) Totally agree
2) Tend to agree
3) Neither agree nor disagree
4) Tend to disagree
5) Totally disagree
6) Hard to say

10. What do you think about the statement claiming that a new nuclear power plant could be built in Lithuania in a partnership with neighbouring countries?

1) Totally agree
2) Tend to agree
3) Neither agree nor disagree
4) Tend to disagree
5) Totally disagree
6) Hard to say

11. In your opinion, should the question regarding nuclear power development in Lithuania be one of the most important issues to the government and the nation?

1) Yes
2) No
3) Hard to say

12. Is, in your opinion, a referendum regarding a new nuclear power plant building in Lithuania necessary?

1) Yes
2) No
3) Hard to say

13. How much do you trust in contemporary science and technology to ensure nuclear safety?

1) Totally trust
2) Trust
3) Neither trust nor mistrust
4) Mistrust
5) Totally mistrust

14. Who, in your opinion, should take care of nuclear development and safety questions? [*A Likert scale question with a scale from 1 to 6, with (1) corresponding to "Totally agree" and (5) "Totally disagree", as well as (6) "Hard to say".*]

1) Society
2) Scientists
3) Businessmen
4) Non-governmental organizations
5) Self-government bodies (municipalities, elderships)
6) Government
7) Seimas
8) European Union
9) United Nations Organization
10) Other international organizations

15. How often do you use these media technologies in order to gain information about nuclear power? [*A Likert scale question with a scale from 1 to 5, with (1) corresponding to "Never" and (5) "Very frequently".*]

1) Newspaper
2) Magazines
3) Television
4) Radio
5) Internet
6) Other sources

16. What is your opinion on the news about nuclear power provided in the media?

1) Exaggerated
2) Truthfully depicted
3) Underestimated

17. What do you think about scientists' opinions regarding nuclear power?

1) [*A part of the statement is missing.*]
2) [*A part of the statement is missing.*]
3) Most of the scientists are not sure whether nuclear power is safe.

42. How often do you use these information sources? [*A Likert scale question with a scale from 1 to 3, with (1) corresponding to "Never" and (3) "Regularly".*]

1) Read national newspapers
2) Read city/district newspapers
3) Read magazines
4) Read popular science publications
5) Watch Lithuanian TV channels
6) Watch local/regional TV channels
7) Watch foreign TV channels
8) Listen to Lithuanian radio stations
9) Listen to foreign radio stations
10) Search for information on Lithuanian online news portals
11) Search for information on foreign online news portals

43. What is your opinion of the media of Lithuania? [*A bipolar question with a scale from 1 to 5.*]

1) Biased – Unbiased
2) Unreliable - Reliable
3) Boring - Interesting
4) Pulp – Serious
5) Unethical – Ethical
6) Corrupted – Uncorrupted
7) Of low quality – Of high quality
8) Sensational – Decent
9) Irresponsible – Responsible
10) Undemocratic – Democratic

44. What newspapers do you commonly read? [*A Likert scale question with a scale from 1 to 3, with (1) corresponding to "Never" and (3) "Regularly".*]

1) Atgimimas
2) Kauno diena
3) Lietuvos rytas
4) Literatūra ir menas
5) Lietuvos žinios
6) District newspaper
7) Respublika
8) Vakarų ekspresas
9) Vakaro žinios
10) 15 minučių
11) Other newspapers

45. What magazines do you commonly read?

46. What TV programmes do you commonly watch? [*A Likert scale question with a scale from 1 to 3, with (1) corresponding to "Never" and (3) "Regularly".*]

1) Cartoons
2) Documentaries
3) News TV programmes
4) Cultural TV programmes
5) Crime-related TV programmes
6) Films
7) Science TV programmes
8) Entertainment/music TV programmes
9) Current affairs TV programmes
10) Reality shows
11) Serials
12) Sports programmes/sports events
13) Other TV programmes

47. What Internet news pages do you commonly visit? [*A Likert scale question with a scale from 1 to 3, with (1) corresponding to "Never" and (3) "Regularly*".]

1) Alfa
2) Akiračiai
3) Balsas
4) Bernardinai
5) Delfi
6) Internet pages of newspapers, magazines
7) Other Internet pages

48. How often do you engage in the following voluntary and societal activities? [*A Likert scale question with a scale from 1 to 3, with (1) corresponding to "Never" and (3) "Regularly*".]

1) Cooperate with other inhabitants of your city/village in solving acute problems of city/village community
2) Take part in demonstrations and protest actions
3) Participate in community's (apartment block community's) activities without any gratification
4) Participate in bees, respond to neighbours' asking for help
5) Donate, give alms, help others with money or things
6) Devote 2% (or other part) of my income-tax to non-governmental organizations
7) Vote in elections
8) Express opinion in press, television, radio
9) Express opinion (write articles, comment) on the Internet
10) Sign petitions
11) Participate in boycotts
12) Take part in non-governmental organizations
13) Organize or in other ways help in financing projects for the community's problem solving
14) Take part in discussions about political and societal issues with friends, neighbours, co-workers
15) Other

49. What organizations or movements do you belong to? [*A leading question with such choices as (1) "I belong", (2) "I belonged but not anymore", (3) "I do not belong*", and (4) "*I do not belong but I would like to*".]

1) Political party
2) Non-governmental organization
3) Community organization on the basis of hobbies
4) Trade union
5) Social movement
6) Other informal communities

50. What would be the most efficient way to participate in environment-related activities? [*A Likert scale question with a scale from 1 to 3, with (1) corresponding to "The least efficient way", (2) "Fair-to-middling efficient way", (3) "Most efficient way*".]

1) Individuals – owners of accommodation, buyers, consumers
2) Citizens – members of communities, non-governmental organizations, political parties
3) Workers – business people, workers in the public sector and other institutions

51. What features, in your opinion, characterize Lithuanian society? [*A bipolar question with a scale from 1 to 5.*]

1) Passiveness – Activeness
2) Non-cohesion – Cohesion
3) Mistrust in other people – Trust in other people
4) Individualism – Collectivism
5) Closeness – Openness
6) Weak bonds – Strong bonds
7) Conformism – Nonconformism
8) Noncooperativeness – Cooperativeness
9) Nondemocratic – Democratic
10) Intolerance – Tolerance
11) Carelessness of nature – Carefulness of nature

52. People often talk about the state's aims for the next 10 years. People prioritize further mentioned aims. Could you tell which of the following aims is the most important?

1) To guarantee fast economic development
2) To guarantee the defence potential of the republic
3) To guarantee more opportunities to participate in decision-making concerning work and place problems
4) To put an effort to make our cities and villages nicer

52. People often talk about the state's aims for the next 10 years. People prioritize further mentioned aims. What would be the second most important aim?

1) To guarantee fast economic development
2) To guarantee the defence potential of the republic
3) To guarantee more opportunities to participate in decision-making concerning work and place problems
4) To put an effort to make our cities and villages nicer

53. If you could choose, what would be the most important matter for you?

1) Maintenance of public order
2) More possibilities to participate in the decision-making processes of the government
3) Fight against inflation
4) Assurance of the freedom of speech

53. If you could choose, what would be the second most important matter for you?

1) Maintenance of public order
2) More possibilities to participate in the decision-making processes of the government
3) Fight against inflation
4) Assurance of the freedom of speech

54. If you could choose, what would be the most important matter for you?

1) Development towards a society based on more humane relationships
2) Development towards a society where ideas are more appreciated than money
3) Fight against crime
4) Stable economics

54. If you could choose, what would be the second most important matter for you?

1) Development towards a society based on more humane relationships
2) Development towards a society where ideas are more appreciated than money
3) Fight against crime
4) Stable economics

55. In the following pictures, the ball depicts nature. The position of the ball illustrates the consequences of human interference with nature. Which of the following four schemes best depict your attitudes towards nature?

1) Nature is unpredictable [*A part of the rest of the statement is missing.*]
2) Nature is predictable to some extent [*A part of the rest of the statement is missing.*]
3) Nature is fragile, unreliable and unforgiving [*A part of the rest of the statement is missing.*]
4) Nature is predictable, generous, stable and forgiving for humans [*A part of the rest of the statement is missing.*]

56. What is your political viewpoint in a scale from 1 to 7 if (1) means a far left political viewpoint and (7) a far right political viewpoint?

57. What is your opinion about the following statements concerning the state, politics, and economics. [*A Likert scale question with a scale from 1 to 5, with (1) corresponding to "Totally disagree" and (5) "Totally agree".*]

1) The state has to have stronger armed forces than it has now
2) People too often doubt the decisions of the government
3) It is very important to preserve the traditions and heritage of the nation
4) Young people should be more disciplined
5) In the right system, people with better skills should earn more
6) Free society can exist only if organizations can operate in the free market
7) The state should provide possibilities for those people who want to work hard and earn accordingly
8) If an individual has the will and skills to acquire wealth, he or she must have the right to dispose and bask in it
9) The state should ensure equal opportunities for everyone
10) The most intelligent individuals should carry the greatest responsibilities in the state
11) Constant economic growth enhances quality of life
12) The state should ensure a good quality of life for everyone
13) Those who earn more should pay higher taxes
14) The fight against poverty should be an integral part of the state's activities
15) There would be fewer wars in the world if wealth was more evenly distributed among states
16) It is better to cooperate with others as little as possible, since there are few people whom you can trust
17) It is impossible to make substantial plans, since the future is uncertain
18) It does not matter whom people vote for in elections, as there is no hope of significant changes
19) Many people are not interested in politics, as they have no influence of them
20) Although an individual works hard, he or she cannot be sure about enhancing their quality of life

58. Which of the following people are like you? [*A Likert scale question with a scale from 1 to 6, with (1) corresponding to "Totally like me" and (6) "Totally different from me"*.]

1) Create new ideas, do everything his/her own way
2) Have a lot of money
3) Live in a safe environment, avoid everything that is dangerous
4) Have a good time, indulge himself/herself
5) Help close ones, take care of their wellbeing
6) Seek that others would notice his/her achievements
7) Live an exciting life with adventures and risks
8) Behave well, avoid behaviour that others would treat negatively
9) Protect nature, environment
10) Comply with traditions and customs
11) Help others without a reward
12) Have a lot of friends and acquaintances
13) Have strong bonds with family, close ones
14) Value stability, since it is very difficult to adapt to changes
15) Occupy leading position
16) Interested in everything, widen sweep
17) Trust in most of the people

59. What is your religious standpoint?

1) I am very religious
2) I am religious
3) I comply with traditions that are related to religion
4) I am not religious
5) My religious standpoint is unsettled
6) Hard to say

60. What is your religion?

1) Catholic
2) Orthodox
3) Lutheran
4) Evangelical
5) Other

61. Gender

1) Male
2) Female

62. Age

1) 18–24
2) 25–34
3) 35–44
4) 45–54
5) 55–64
6) 65–74
7) 75 +

63. Occupation

1) Self-employed (owner)
2) Employee in private sector
3) Employee in public sector
4) On maternity leave/housewife
5) Unemployed
6) Pensioner
7) Schoolchild
8) Student
9) Other

64. Marital status

1) Married
2) Single
3) Unmarried partners
4) Divorced
5) Widower/widow

65. Your academic degree

1) University
2) Incomplete university
3) Vocational
4) Secondary
5) Compulsory
6) Primary

66. What is the field of your education?

1) Engineering
2) Economics
3) Natural sciences
4) Social sciences
5) Humanitarian sciences
6) Other

67. Your nationality

1) Lithuanian
2) Polish
3) Russian
4) Other

68. Could you tell what the average montly salary of one of your family member is?

1) To 200 Lt
2) 201–350 Lt
3) 351–450 Lt
4) 451–600 Lt
5) 601–800 Lt
6) 801–1000 Lt
7) 1001–1200 Lt
8) 1201–1500 Lt
9) More than 1500 Lt

Appendix 5 Survey questionnaire of the RISICUS study in Lithuanian

Klausimai, susiję su klimato kaita ir genetiškai modifikuotais organizmais, nėra teikiami, nes jie neaktualūs šiam darbui. Tačiau visi kiti klausimai yra teikiami nepaisant to, ar jie buvo analizuojami tyrime, ar ne. Klausimų numeracija yra tokia pati kaip ir RISICUS tyrimo medžiagoje. Pastabos apie trūkstančius atsakymus į klausimus yra nurodytos laužtiniuose skliaustuose.

1. Kokios, Jūsų supratimu, šiuo metu aktualiausios problemos Lietuvai?

1) AIDS
2) Alkoholizmas
3) Bedarbystė
4) Biurokratizmas
5) Buitinės atliekos ir šiukšlės
6) Emigracija
7) Energetinė priklausomybė
8) Demokratiškumo stoka
9) Kainų kilimas (infliacija)
10) Karas keliuose
11) Klimato kaita
12) Korupcija
13) Kriminaliniai nusikaltimai
14) Narkomanija
15) Oro tarša
16) Tarptautinis terorizmas
17) Vandens tarša
18) Verslo grupuočių įsigalėjimas valstybės valdyme ir žiniasklaidoje (oligarchija)
19) Skurdas
20) Kitos problemos

2. Kuri iš aukščiau išvardintų problemų Jūsų nuomone yra šiuo metu aktualiausia Lietuvoje?

1) AIDS
2) Alkoholizmas
3) Bedarbystė
4) Biurokratizmas
5) Buitinės atliekos ir šiukšlės
6) Emigracija
7) Energetinė priklausomybė
8) Demokratiškumo stoka
9) Kainų kilimas (infliacija)
10) Karas keliuose
11) Klimato kaita
12) Korupcija
13) Kriminaliniai nusikaltimai
14) Narkomanija
15) Oro tarša
16) Tarptautinis terorizmas
17) Vandens tarša
18) Verslo grupuočių įsigalėjimas valstybės valdyme ir žiniasklaidoje (oligarchija)
19) Skurdas
20) Kitos problemos

3. Kokią grėsmę, Jūsų nuomone, kelia šios sritys/problemos, susijusios su mokslo ir technologine pažanga bei žmogaus sveikata, gyvybe, ekologija?

1) Abortai
2) Atominė energetika
3) Augalų ir gyvūnų klonavimas
4) Dirbtinis apvaisinimas
5) Eutanazija
6) Galvijų pasiutligė
7) Genetiškai modifikuoti organizmai
8) Gyvosios gamtos rūšių nykimas
9) Klimato kaita
10) Konservantų bei kitų biocheminių medžiagų naudojimas maiste
11) Paukščių gripo epidemija
12) Organų donorystė
13) Ozono sluoksnio retėjimas
14) Žmogaus klonavimas

4. Kokios institucijos Jums svarbiausios, informuojant apie aktualias ekologines problemas ir keliant ekologinį sąmoningumą?

1) Tarptautinės organizacijos
2) Bažnyčia
3) Bendruomenių centrai, seniūnijos
4) Draugai, bendradarbiai
5) Gyventojų bendrijos
6) Lietuvos žiniasklaida
7) Užsienio žiniasklaida
8) Mokslo ir švietimo įstaigos
9) Miestų bei rajonų savivaldybės
10) Nevyriausybinės (visuomeninės) organizacijos
11) Politinės partijos
12) Pramonės įmonės bei kitos verslo organizacijos
13) Šeima, artimieji, giminės
14) Valstybinės aplinkos apsaugos institucijos
15) Valstybinės sveikatos apsaugos institucijos
16) Kitos institucijos

5. Ką manote apie teiginį, kad Lietuvai būtina naujos modernios atominės elektrinės statyba?

1) Visiškai nepritariu
2) Labiau nepritariu nei pritariu
3) Nei pritariu, nei nepritariu
4) Labiau pritariu nei nepritariu
5) Visiškai pritariu
6) Sunku pasakyti

6. Ką manote apie teiginį, kad naujos atominės elektrinės Lietuvai nereikia, – kad šalies poreikius patenkins kiti energijos šaltiniai?

1) Visiškai nepritariu
2) Labiau nepritariu nei pritariu
3) Nei pritariu, nei nepritariu
4) Labiau pritariu nei nepritariu
5) Visiškai pritariu
6) Sunku pasakyti

7. Ką, Jūsų požiūriu, dabartinė Ignalinos atominė elektrinė reiškia Lietuvai?

1) Ekonominį Lietuvos savarankiškumą
2) Avarijos grėsmę
3) Tyčinės avarijos grėsmę
4) Energetinę Lietuvos nepriklausomybę
5) Ekonominę naštą Lietuvos žmonėms
6) Radioaktyvių atliekų laidojimo problemą
7) Lietuvos nacionalinio saugumo garantą
8) Oligarchijos (verslo ir valstybinės valdžios persipynimo) grėsmę
9) Lietuvos indėlį mažinant globalinį atšilimą
10) Kita

8. Ką, Jūsų požiūriu, naujos atominės elektrinės statyba reiškia Lietuvai?

1) Ekonominį Lietuvos savarankiškumą
2) Avarijos grėsmę
3) Tyčinės avarijos grėsmę
4) Energetinę Lietuvos nepriklausomybę
5) Ekonominę naštą Lietuvos žmonėms
6) Radioaktyvių atliekų laidojimo problemą
7) Lietuvos nacionalinio saugumo garantą
8) Oligarchijos (verslo ir valstybinės valdžios persipynimo) grėsmę
9) Lietuvos indėlį mažinant globalinį atšilimą
10) Kita

9. Ką Jūs manote apie teiginį, kad nauja atominė elektrinė Lietuvoje turėtų būti statoma bei valdoma tik valstybės, be privataus akcinio kapitalo

1) Visiškai nepritariu
2) Labiau nepritariu nei pritariu
3) Nei pritariu, nei nepritariu
4) Labiau pritariu nei nepritariu
5) Visiškai pritariu
6) Sunku pasakyti

10. Ką Jūs manote apie idėją statyti Lietuvoje atominę elektrinę partnerystėje kartu su kitomis kaimyninėmis šalimis?

1) Visiškai nepritariu
2) Labiau nepritariu nei pritariu
3) Nei pritariu, nei nepritariu
4) Labiau pritariu nei nepritariu
5) Visiškai pritariu
6) Sunku pasakyti

11. Ar, Jūsų nuomone, reikėtų atominės energetikos plėtotės Lietuvoje klausimą priskirti prie svarbiausių Valstybės bei Tautos gyvenimo klausimų?

1) Taip
2) Ne
3) Sunku pasakyti

12. Ar, Jūsų nuomone, būtinas referendumas dėl naujos atominės elektrinės statybos Lietuvoje?

1) Taip
2) Ne
3) Sunku pasakyti

13. Kiek Jūs pasitikite šiuolaikinio mokslo ir technologijų gebėjimu užtikrinti atominės energetikos saugumą?

1) Visiškai nepasitikiu
2) Nepasitikiu
3) Nei pasitikiu, nei nepasitikiu
4) Pasitikiu
5) Visiškai pasitikiu

14. Kas, Jūsų nuomone, turėtų rūpintis atominės energetikos plėtros ir saugumo klausimais?

1) Visuomenė
2) Mokslininkai
3) Verslininkai
4) Nevyriausybinės organizacijos
5) Savivaldos organai (savivaldybės, seniūnijos)
6) Vyriausybė
7) Seimas
8) Europos Sąjunga
9) Jungtinių tautų organizacija
10) Kitos tarptautinės organizacijos

15. Kaip dažnai Jūs naudojatės šiais žiniasklaidos šaltiniais gaudami informaciją apie atominę energetiką?

1) Laikraščiai
2) Žurnalai
3) Televizija
4) Radijas
5) Internetas
6) Kiti šaltiniai

16. Ką manote apie žiniasklaidoje pateikiamas naujienas dėl atominės energetikos?

1) Žiniasklaida per daug sureikšmina tikrąją padėtį ir klausimo svarbą
2) Žiniasklaida atspindi tikrąją padėtį ir klausimo svarbą
3) Žiniasklaida per menkai atspindi padėtį ir klausimo

17. Ką manote apie mokslininkų nuostatas dėl atominės energetikos?

1) [*Neaiškiai nurodyta duomenyse.*]
2) [*Neaiškiai nurodyta duomenyse.*]
3) Dauguma mokslininkų nėra tikri, ar atominė energetika saugi.

42. Kaip dažnai Jūs naudojatės šiais žiniasklaidos šaltiniais?

1) Skaitote respublikinius laikraščius
2) Skaitote miesto/rajono laikraščius
3) Skaitote žurnalus
4) Skaitote mokslo populiarinimo leidinius
5) Žiūrite lietuviškus TV kanalus
6) Žiūrite vietinius/regioninius TV kanalus
7) Žiūrite užsienio TV kanalus
8) Klausotės lietuviškų radijo stočių
9) Klausotės užsienio radijo stočių
10) Ieškote informacijos Internete Lietuvos žinių portaluose
11) Ieškote informacijos Internete užsienio žinių portaluose

43. Kokia Jūsų nuomonė apie Lietuvos žiniasklaidą?

1) Šališka – Nešališka
2) Nepatikima – Patikima
3) Nuobodi – Įdomi
4) Bulvarinė – Rimta
5) Neetiška – Etiška
6) Korumpuota – Nekorumpuota
7) Nekokybiška – Kokybiška
8) Skandalų besivaikanti – Padori
9) Neatsakinga – Atsakinga
10) Nedemokratiška – Demokratiška

44. Kokius laikraščius dažniausiai skaitote?

1) Atgimimas
2) Kauno diena
3) Lietuvos rytas
4) Literatūra ir menas
5) Lietuvos žinios
6) Rajoninis laikraštis
7) Respublika
8) Vakarų ekspresas
9) Vakaro žinios
10) 15 minučių
11) Kiti laikraščiai

45. Kokius žurnalus dažniausiai skaitote?

46. Kokias TV laidas dažniausiai žiūrite?

1) Animaciniai filmai
2) Dokumentiniai filmai
3) Informacinės žinių laidos
4) Kultūros laidos
5) Kriminalinio pobūdžio laidos
6) Meniniai vaidybiniai filmai
7) Mokslo-pažintinės laidos
8) Pramoginės/humoro/ muzikinės laidos
9) Publicistinės laidos
10) Realybės šou
11) Serialai
12) Sporto laidos/sporto varžybos
13) Kitos laidos

47. Kokiose internetinėse naujienų svetainėse dažniausiai lankotės?

1) Alfa
2) Akiračiai
3) Balsas
4) Bernardinai
5) Delfi
6) Laikraščių, žurnalų e-svetainės
7) Kitos internetinės svetainės

48. Kaip dažnai Jūs dalyvaujate savanoriškoje ir pilietinėje veikloje?

1) Bendradarbiauju su kitais kaimo/miesto gyventojais sprendžiant aktualias kaimo/miesto/rajono bendruomenės problemas
2) Dalyvauju demonstracijose ar protesto akcijose
3) Neatlygintinai dalyvauju bendruomenės (namo bendrijos) veikloje
4) Dalyvauju talkose, atsiliepiu į kaimynų prašymus padėti
5) Aukoju, duodu išmaldos, šelpiu kitus pinigais ar daiktais
6) Skiriu 2% (ar kitą dalį) savo pajamų mokesčių sumos nevyriausybinėms organizacijoms
7) Balsuoju rinkimuose
8) Pasisakau spaudoje, TV, radijuje
9) Pasisakau (rašau straipsnius, komentarus) internete
10) Pasirašau peticijas
11) Dalyvauju boikotuose
12) Dalyvauju nevyriausybinėse (ne pelno) organizacijose
13) Rengiu ar kitaip prisidedu rengiant projektus gauti finansavimą bendruomenės problemoms spręsti
14) Dalyvauju diskusijose su draugais, kaimynais, bendradarbiais politikos bei visuomenės klausimais
15) Kita

49. Kokioms organizacijoms ar judėjimams priklausote?

1) Priklausau politinei partijai
2) Priklausau nevyriausybinei organizacijai
3) Priklausau visuomeninei organizacijai pagal pomėgius
4) Priklausau profsąjungai
5) Priklausau socialiniam judėjimui
6) Priklausau kitoms neformalioms bendrijoms

50. Kokiais būdais Jūs galėtumėte veiksmingiausiai dalyvauti aplinkosauginėje veikloje?

1) Individai – būsto sąvininkai, gaminių pirkėjai, vartotojai
2) Piliečiai – bendruomenių, nevyriausybinių organizacijų, politinių partijų nariai
3) Darbuotojai – verslo žmonių, valstybinių ir kitų įstaigų

51. Kokie bruožai, Jūsų nuomone, yra būdingi Lietuvos visuomenei?

1) Pasyvumas – Aktyvumas
2) Nesitelkimas – Susitelkimas
3) Nepasitikėjimas kitais žmonėmis – Pasitikėjimas kitais žmonėmis
4) Individualizmas – Kolektyviškumas, bendruomeniškumas
5) Uždarumas – Atvirumas
6) Silpni tarpusavio ryšiai – Stiprūs tarpusavio ryšiai
7) Komformizmas – Pasipriešinimas
8) Atsiribojimas/ nebendradarbiavimas – Savitarpiškumas/bendradarbiavimas
9) Nedemokratiškumas – Demokratiškumas
10) Netolerancija – Tolerancija
11) Nesirūpinimas gamta ir aplinka – Rūpinimasis gamta ir aplinka

52. Žmonės dažnai kalba apie šalies tikslus per artimiausius 10 metų. Žemiau išvardinti tikslai, kuriems žmonės suteikia prioritetą. Ar galėtumėte pasakyti, kuris iš žemiau pasirinktų tikslų yra svarbiausias?

1) Užtikrinti spartų ekonominį vystymąsi
2) Užtikrinti Respublikos gynybinį pajėgumą
3) Užtikrinti didesnes galimybes dalyvauti sprendžiant darbo ir vietos problemas
4) Stengtis gražiau sutvarkyti mūsų miestus ir kaimus

52. Žmonės dažnai kalba apie šalies tikslus per artimiausius 10 metų. Žemiau išvardinti tikslai, kuriems žmonės suteikia prioritetą. Ką pasirinktumėte antroje vietoje?

1) Užtikrinti spartų ekonominį vystymąsi
2) Užtikrinti Respublikos gynybinį pajėgumą
3) Užtikrinti didesnes galimybes dalyvauti sprendžiant darbo ir vietos problemas
4) Stengtis gražiau sutvarkyti mūsų miestus ir kaimus

53. Jei Jums tektų rinktis, kas iš išvardintų dalykų Jums būtų svarbiausias?

1) Palaikyti viešąją tvarką respublikoje
2) Sudaryti žmonėms daugiau galimybių dalyvauti priimant svarbius Vyriausybės sprendimus
3) Kovoti prieš kainų augimą
4) Užtikrinti žodžio laisvę

53. Jei Jums tektų rinktis, ką pasirinktumėte antroje vietoje?

1) Palaikyti viešąją tvarką respublikoje
2) Sudaryti žmonėms daugiau galimybių dalyvauti priimant svarbius Vyriausybės sprendimus
3) Kovoti prieš kainų augimą
4) Užtikrinti žodžio laisvę

54. Jei Jums tektų rinktis, kas iš išvardintų dalykų Jums būtų svarbiausias?

1) Vystymasis link visuomenės, pagrįstos humaniškesniais santykiais
2) Vystymasis link visuomenės, kurioje idėjos vertinamas labiau nei pinigai
3) Kova su nusikalstamumu
4) Stabili ekonomika

54. Jei Jums tektų rinktis, ką pasirinktumėte antroje vietoje?

1) Vystymasis link visuomenės, pagrįstos humaniškesniais santykiais
2) Vystymasis link visuomenės, kurioje idėjos vertinamas labiau nei pinigai
3) Kova su nusikalstamumu
4) Stabili ekonomika

55. Pateiktuose piešinėliuose kamuolys atspindi gamtą: Kamuolio elgesys schemoje apibūdina žmogaus veiklos pasekmes gamtai: Nurodykite, kuris iš keturių požiūrių geriausiai atspindi Jūsų požiūrį į gamtą?

1) Gamta yra neprognozuojama [*Tolesnė teiginio dalis neaiškiai nurodyta duomenyse.*]
2) Gamta tam tikrose ribose yra prognozuojama [*Tolesnė teiginio dalis neaiškiai nurodyta duomenyse.*]
3) Gamta yra trapi, nepatikima ir neatlaidi [*Tolesnė teiginio dalis neaiškiai nurodyta duomenyse.*]
4) Gamta yra prognozuojama, dosni, stabili ir atleidžianti žmogui [*Tolesnė teiginio dalis neaiškiai nurodyta duomenyse.*]

56. Kaip galėtumėte apibūdinti savo politines pažiūras skalėje nuo 1 iki 7, jei 1 reikštų kairiosios politinės pažiūros, o 7 – dešiniosios politinės pažiūros?

57. Toliau pateikiami įvairūs teiginiai apie valstybę, politiką, ekonomiką.

1) Valstybė privalo turėti stipresnes karines pajėgas nei dabar
2) Žmonės per dažnai abejoja valdžios sprendimais
3) Labai svarbu išsaugoti tautos tradicijas ir paveldą
4) Šių dienų jaunimas turėtų būti labiau disciplinuotas
5) Teisingoje sistemoje žmonės su didesniais gabumais turėtų uždirbti daugiau
6) Laisva visuomenė gali egzistuoti tik tuomet, jei įmonių veiklai yra sudarytos laisvos rinkos sąlygos
7) Žmonėms, kurie nori, valstybė turėtų suteikti galimybes daug dirbti ir atitinkamai uždirbti
8) Jei žmogus turi valios ir gabumų užgyventi turtą, jam turi būti garantuota teisė juo naudotis ir džiaugtis
9) Valstybė turėtų užtikrinti visiems piliečiams lygias galimybes
10) Protingiausieji turėtų prisiimti didžiausią atsakomybę valstybėje
11) Nuolatinis ekonominis augimas garantuoja gyvenimo kokybės augimą
12) Valstybė turėtų visiems užtikrinti gerą gyvenimo kokybę
13) Tie, kurie daugiau uždirba, turėtų mokėti didesnį mokesčių procentą
14) Skurdo mažinimas turėtų būti neatsiejama Vyriausybės veiklos dalimi
15) Pasaulyje vyktų mažiau karų, jei turtas tarp valstybių būtų pasiskirstęs tolygiau
16) Geriau kuo mažiau bendradarbiauti su kitais žmonėmis, nes mažai kuo galima pasitikėti

17) Ateitis yra per daug neapibrėžta, todėl neįmanoma kurti rimtų planų
18) Nesvarbu už ką žmonės balsuoja per rinkimus, vis tiek neverta tikėtis ženklių pokyčių
19) Daugeliui žmonių nerūpi politika, nes jie negali jos įtakoti
20) Net ir sunkiai dirbdamas, žmogus negali būti tikras, kad jo gyvenimo kokybė pagerės

58. Kuris iš žemiau apibūdintų žmonių yra panašus į Jus?

1) Kurti naujas idėjas, viską daryti savaip
2) Būti turtingam, turėti daug pinigų
3) Gyventi saugioje aplinkoje, vengti visko, kas pavojinga
4) Gerai leisti laiką, lepinti save
5) Padėti šalia esantiems žmonėms rūpintis jų gerove
6) Siekti, kad kiti pastebėtų jo(s) pasiekimus
7) Gyventi jaudinantį gyvenimą su nuotykiais ir rizika
8) Visada gerai elgtis, vengti elgesio, kurį aplinkiniai traktuotų kaip netinkamą
9) Rūpintis aplinka, gamtosauga
10) Laikytis tradicijų papročių, perduodamų iš kartos į kartą
11) Padėti kitiems be atlygio
12) Turėti daug draugų ir pažįstamų
13) Palaikyti tamprius ryšius su šeima, artimaisiais
14) Jaustis stabiliai, nes itin sunku prisitaikyti prie pokyčių
15) Būti lyderiu
16) Viskuo domėtis, plėsti akiratį
17) Pasitikėti dauguma žmonių

59. Kokios Jūsų religinės pažiūros?

1) Esu giliai tikinti(s)
2) Esu tikinti(s)
3) Laikausi papročių, kurie tradiciškai susiję su religija
4) Esu netikinti(s)
5) Mano religinės nuostatos permainingos
6) Sunku pasakyti

60. Kuriai religinei konfesijai priklausote?

1) Katalikų
2) Stačiatikių
3) Liuteronų
4) Evangelikų
5) Kitai

61. Respondento lytis

1) Vyras
2) Moteris

62. Amžius

1) 18–24
2) 25–34
3) 35–44
4) 45–54
5) 55–64
6) 65–74
7) 75 +

63. Jūsų užsiėmimas

1) Pats sau darbdavys (-ė) (savininkas)
2) Samdomas darbuotojas privačiame sektoriuje
3) Darbuotojas valstybiniame sektoriuje
4) Dekretinėse/vaiko priežiūros atostogose/namų šeimininkė
5) Bedarbis, ieškote darbo
6) Pensijoje
7) Moksleivis
8) Studentas
9) Kita

64. Jūsų šeimyninė padėtis

1) Vedęs/ištekėjusi
2) Nevedęs/netekėjusi
3) Gyvenu su partneriu
4) Išsiskyręs (-usi)
5) Našlys (-ė)

65. Jūsų išsimokslinimas

1) Aukštasis
2) Nebaigtas aukštasis
3) Aukštesnysis
4) Vidurinis
5) Pagrindinis
6) Pradinis

66. Kurios srities yra Jūsų išsimokslinimas?

1) Inžinierinis
2) Ekonominis
3) Gamtos mokslų
4) Socialinių mokslų
5) Humanitarinių mokslų
6) Kita

67. Jūsų tautybė

1) Lietuvis (-ė)
2) Lenkas (-ė)
3) Rusas (-ė)
4) Kita

68. Gal galėtumėte nurodyti vidutines vieno Jūsų šeimos nario pajamas per mėnesį?

1) Iki 200 Lt
2) 201–350 Lt
3) 351–450 Lt
4) 451–600 Lt
5) 601–800 Lt
6) 801–1000 Lt
7) 1001–1200 Lt
8) 1201–1500 Lt
9) Daugiau nei 1500 Lt

Appendix 6 Numerical results of the quantitative study

Table 10 Socio-demographic characteristics of the respondents.

Demographic characteristic	Frequency	Percentage
N	1000	100
Gender		
Male	435	43.5
Female	563	56.3
Age		
18–24	118	11.8
25–34	124	12.4
35–44	176	17.6
45–54	160	16.0
55–64	174	17.4
65–74	166	16.6
75 +	82	8.2
Education		
University	244	24.4
Incomplete university	59	5.9
Vocational	324	32.4
Secondary	221	22.1
Compulsory	88	8.8
Primary	64	6.4

Table 11 Results of correlation analysis concerning nuclear benefits and trust in science and technology to assure nuclear safety.

What does, in your opinion, current Ignalina nuclear power plant mean for Lithuania?	Lithuanian economic self-sufficiency	Lithuanian energy independence	Lithuanian national security	Lithuanian contribution to limit climate change
Trust in science and technology to assure nuclear safety	Spearman's rho=0.303, p<0.01	Spearman's rho=0.215, p<0.01	Spearman's rho=0.233, p<0.01	Spearman's rho=0.104, p<0.05

Table 12 Results of T test analysis concerning nuclear risks and gender.

What does, in your opinion, current Ignalina nuclear power plant mean for Lithuania?	Malfunction risk	The risk of deliberate incident (e.g. terrorism)	Economic burden for Lithuania's citizens	The problem of nuclear waste disposal
Gender	t(795)=-4.56, p=0.000	t(892)=-2.06, p=0.039	t(886)=-2.62, p=0.009	t(835)=-2.35, p=0.018
Males	M=3.4, SD=0.87	M=3.1, SD=1.12	M=2.8, SD=1.17	M=3.8, SD=0.93
Females	M=3.7, SD=0.84	M=3.3, SD=1.09	M=3.0, SD=1.13	M=4.0, SD=0.86

Table 13 Results of correlation analysis concerning nuclear risks and associated danger.

What does, in your opinion, current Ignalina nuclear power plant mean for Lithuania?	Malfunction risk	The risk of deliberate incident (e.g. terrorism)	Economic burden for Lithuania's citizens	The problem of nuclear waste disposal	The threat of oligarchy
Associated danger	Spearman's rho=0.436, p<0.01	Spearman's rho=0.383, p<0.01	Spearman's rho=0.265, p<0.01	Spearman's rho=0.243, p<0.01	Spearman's rho=0.162, p<0.01

Table 14 Frequency and percentage distribution of answers to the question: "*What magazines do you commonly read?*"

What magazines do you commonly read?	Frequency	Percentage	What magazines do you commonly read?	Frequency	Percentage
Žmonės	171	17.1	Mūsų sodai	2	0.2
Moteris	59	5.9	Mokslas ir gyvenimas	2	0.2
Laima	26	2.6	Darbštuolė	2	0.2
Ji	24	2.4	Liza	1	0.1
Stilius	22	2.2	National Geographic	1	0.1
Panelė	21	2.1	Lemtis	1	0.1
Veidas	17	1.7	Spotkania	1	0.1
TV antena	17	1.7	Moters savaitė	1	0.1
TV savaitė	15	1.5	Mūsų girios	1	0.1
Moters savaitgalis	12	1.2	Policija	1	0.1
Savaitė su TV	11	1.2	Žurnalas apie gamtą	1	0.1
Ekstra	10	1.0	Meškeriotojas	1	0.1
Sodo spalvos	10	1.0	Nuo iki	1	0.1
Cosmopolitan	8	0.8	Sodo idėjos	1	0.1
Edita	8	0.8	Gydymo menas	1	0.1
4 ratai	7	0.7	Versus	1	0.1
Mano namai	7	0.7	Vestnik	1	0.1
Gyvenimiškos istorijos	6	0.6	Laisvalaikis	1	0.1
Ieva	6	0.6	Technika mums	1	0.1
Krepšinis	6	0.6	Oho	1	0.1
Tavo vaikas	5	0.5	Žemės ūkis	1	0.1
Verslo klasė	5	0.5	SPO	1	0.1
Naujoji komunikacija	5	0.5	Rankdarbių kraitelė	1	0.1
Psichologija tau	5	0.5	Statyk	1	0.1
Žvejys ir žuvis	4	0.4	Klubas	1	0.1
Artuma	4	0.4	Moto +	1	0.1
Tik vyrams	4	0.4	Gramofonas	1	0.1
Iliustruotas mokslas	4	0.4	Provincija	1	0.1
Julius/Brigita	4	0.4	Statyba ir architektūra	1	0.1

Verslo labirintas	4	0.4	TV diena	1	0.1
Mano ūkis	4	0.4	Atleisk	1	0.1
TV gidas	4	0.4	Medicina visiems	1	0.1
Sveikas žmogus	3	0.3	Floristika	1	0.1
Scientific American	3	0.3	Tavo namai	1	0.1
Būrėja	3	0.3	Rankdarbiai plius.	1	0.1
FHM	3	0.3	Visažinis		
Sveikata	3	0.3	Netradicinė medicina	1	0.1
Kompiuterija	3	0.3	TV arena	1	0.1
Auto Moto	3	0.3	Viltys ir likimai	1	0.1
Domašnij doktor	3	0.3	Rolling Stones	1	0.1
Istorijos	3	0.3	Aš ir psichologija	1	0.1
Auto Bild	3	0.3	Za ruliom	1	0.1
Valstybė	3	0.3	Autoplius	1	0.1
Medžiotojas	2	0.2	Bičiulis	1	0.1
Meisteris	2	0.2	Mano gyvenimas	1	0.1
Sveikatos ABC	2	0.2	Mamos žurnalas	1	0.1
Geri patarimai	2	0.2	Žmogus ir visata	1	0.1
Medicina	2	0.2	Naujoji Romuva	1	0.1
Computer Bild	2	0.2	Selezičių žinios	1	0.1
Mokslas ir technika	2	0.2	No answer	387	38.7

Table 15 Frequency and percentage distribution of answers to the question: "*How often do you engage in voluntary and political activities?*"

How often do you engage in voluntary and political activities?	Regularly n, %	Sometimes n, %	Never n, %	No answer n, %
Vote in elections	688,	198,	114,	1,
	68.7	19.8	11.4	0.1
Devote 2% (or other part) of my income-tax to non-	243,	112,	643,	3,
governmental organizations	24.3	11.2	64.2	0.3
Take part in discussions about political and societal issues	169,	534,	295,	3,
with friends, neighbours, co-workers	16.9	53.3	29.5	0.3
Participate in bees, respond to neighbours' asking for help	135,	630,	235,	1,
	13.5	62.9	23.5	0.1
Participate in community's (apartment block community's)	113,	425,	452,	11,
activities without any gratification	11.3	42.5	45.2	1.1
Donate, give alms, help others with money or things	76,	600,	320,	5,
	7.6	59.9	32.0	0.5
Cooperate with other inhabitants of your city/village in	43,	308,	646,	4,
solving acute problems of city/village community	4.3	30.8	64.5	0.4
Take part in non-governmental organizations	35,	81,	884,	1,
	3.5	8.1	88.3	0.1
Sign petitions	26,	195,	779,	1,

	2.6	19.5	77.8	0.1
Organize or in other ways help in financing projects for the community's problem solving	22, 2.2	103, 10.3	874, 87.3	2, 0.2
Express opinion (write articles, comment) on the Internet	18, 1.8	104, 10.4	877, 87.6	2, 0.2
Participate in boycotts	4, 0.4	37, 3.7	958, 95.7	2, 0.2
Take part in demonstrations and protest actions	3, 0.3	106, 10.6	891, 89.0	1, 0.1
Express opinion in press, television, radio	3, 0.3	65, 6.5	931, 93.0	2, 0.2