# SARLÓS GÁBOR: RISK AND BENEFIT PERCEPTIONS IN THE COMMUNICATION NARRATIVES OF NUCLEAR ENERGY IN HUNGARY

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ELTE Szociológia Doktori Iskola Interdiszciplináris Doktori Program

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Habilitált egyetemi docens

# SARLÓS GÁBOR: KOCKÁZATOK ÉS ELŐNYÖK AZ ATOMENERGIA MAGYARORSZÁGI KOMMUNIKÁCIÓS NARRATÍVÁIBAN

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# LIST OF ABBREVIATIONS AND OFTEN USED NAMES

names and terms	explanation	category
AJBH	Office of the Commissioner for Fundamental Rights	authority
EMLA	Environmental Management and Law Association	NGO
Energiaklub	Climate Policy Institute	NGO
Euratom	European Atomic Energy Community	EU organization
Fidesz	Young Democrats, conservative party, majority government partner	political party
Göncöl	Environmental foundation	NGO
Greenpeace	Global campaigning organization	NGO
IAEA	International Atomic Energy Agency	UN tied organization
IEA	International Energy Agency	industry organization
ILW	Intermediate-level wastes	terminology
Jobbik	Movement for Better Hungary, nationalist radical party, opposition	political party
KDNP	Christian Democratic People' Party, junior coalition partner	political party
LLW	Low-level wastes	terminology
LMP	Politics can be Different, green party, opposition	political party
MP	Member of Parliament	terminology
MSZP	Hungarian Socialist Party, opposition	political party
MTVSZ	National Society of Conservationists	NGO
MVM Ltd.	Hungarian Electricity Company, state owned	licensee
NAIH	National Authority for Data Protection and Freedom of Information	authority
NEFMI	Ministry of National Development	government
NPP	Nuclear Power Plant	terminology
ОАН	Hungarian Atomic Energy Authority	authority
Paks	Site of Hungarian nuclear power plant for electricity production as well as name of the company operating the current reactors	licensee
Paks2	Development project company for doubling current Paks capacity	licensee
PM	Dialogue Hungary, green party, opposition, no faction in Parliament	political party
REC	Regional Environmental Center	NGO
VM	Ministry of Rural Development	government

## **CHRONOLOGY**

The list includes key milestones of the discourse on nuclear energy, from the resolution on preliminary preparations for building new nuclear reactors to the approval of expansion plans.

date	action	character
02.04. 2009	Parliamentary resolution to start preliminary investigative preparations to expand Paks NPP by building two new reactors	legal, political
12.05. 2010	Turkey and Russia sign deal for Rosatom to build first Turkish NPP	international
16.09. 2010	Energiaklub appeals to court for Paks ZRT to share Teller project data with public	legal
03.10. 2011	Parliament approves National Energy Strategy 2030 that places supply security, competitiveness and sustainability in the focus. The strategy defines key role for nuclear energy, coal and renewables, together with emphasis on energy savings.	legal
11.03. 2011	Earthquake and tsunami hit Japan and demolish considerable part of Fukushima DaiChi NPP. Effects include not only destruction of natural and human environment and of living conditions, but drastically change concepts and standards worldwide on NPP operations, role and functioning of control authorities and issues of safety, planning and financial resources.	natural, international
18.05. 2011	Sándor Fülöp, Ombudsman for Future Generations finds claim of Energiaklub justified that Parliament resolution on extension plans was unfounded, and urges government to enforce necessary analyses and propose modification of legislation	legal, political
30.05. 2011	Significantly influenced by the Fukushima accident, German government announces plans to close all NPPs by 2022	international
27.04. 2011	Court decision binds Paks ZRT to share data on Teller project, a study on the needs of nuclear development, with Energiaklub and with public	legal
27.06. 2011	Parliament accepts modification of nuclear energy act, enforcing role of control authorities but easing licensing approval process for nuclear institutions	legal
21.07. 2011	Energiaklub turns to Paks ZRT for full sharing of Teller project documents as important data are hidden in the documents	legal
18.08. 2011	Paks ZRT hands over Teller project documentation in fully legible format to Energiaklub	legal
27.10. 2011	Energiaklub hosts conference on "Energy and the Public Sphere"	professional
14.11. 2011	Parliament refuses LMP motion to discuss resolution on creating framework for nationwide public discussion on future need of nuclear energy	legal, political
24- 26.11. 2011	Ökopolisz Foundation organizes national conference in Pécs on multi-dimensional aspects of nuclear energy	professional
18.01. 2012	Szekszárd court binds Paks ZRT to share missing documentation of Teller project with public	legal

date	action	character
17.04. 2012	Ombudsman raises concerns about incomplete documentation of storage of Low and Intermediate Level Waste at Bátaapáti, and initiates regulatory changes	legal
22.05. 2012	Pan-European stress test qualifies safety of Paks NPP among the highest, but notes deficiencies in depositing of used fuel rods	international
14.10. 2012	Advisory referendum in Lithuania rejects construction of new NPP	international
28.11. 2012	Supreme court obliges Paks ZRT to share data with the public related to the Lévai project, a study on the actual feasibility of nuclear development	legal
11.12. 2012	Parliament approves modification of nuclear energy law: new regulation limits rights of courts to suspend activities of nuclear institutions	legal
27.01. 2013	Majority of voters support construction of a new NPP in Bulgaria but referendum is invalid due to insufficient turnout	international
18.02. 2013	Parliament approves Paks NPP safety report for the years 2009-2011	legal
05.06. 2013	Energiaklub hosts conference on "Paks Expansion: Constraints and Risks"	professional
10.10. 2012	Ökopolisz Foundation and Heinrich Böll Foundation organize conference in Budapest on feasibility of nuclear agenda	professional
10.10. 2012		
10-11 2013	Prime Minister Viktor Orbán visits Saudi Arabia, India and Japan, to discuss, among others, cooperation in the field of nuclear energy production. State Secretary for Foreign Affairs Péter Szíjjártó visits Korea and China with similar purpose.	political, international
28.10, 04.11. 2013	LMP raises the issue of costs of Paks 2003 breakdown. Government confirms insurance and responsible party covered costs. PM requests exact calculation of Paks expansion, but government refuses sharing data claiming it would put competitive pricing to risk.	political
11.06. 2013	Parliament approves repeated modification of nuclear energy law. Modifications concern management of data and funds related to nuclear energy.	legal
07.11. 2013	Nuclear Transparency Watch, a European network for civil society vigilance on nuclear safety and transparency is created	international
09.12. 2013	Parliament approves modification of law on spatial planning. Resolution eases legal background for establishment of new nuclear reactors at Paks.	legal
13.12. 2013	Human Ecology Department of ELTE Budapest University hosts "Paks Vobiscum?" conference on multi-dimensional aspects of nuclear energy development plans	professional
17.12. 2013	Minister of State János Lázár informs Parliament Economic Committee that Hungary extends its nuclear cooperation with Russia and will ensure long term capacity maintenance of Paks NPP within this cooperation	political
13.01. 2014	Prime Minister Viktor Orbán signs nuclear cooperation agreement with Vladimir Putin and announces that Russian Rosatom will build 2 new reactors at Paks,	political

### **CHAPTER I: INTRODUCTION**

### 1.1. Objectives of the dissertation

The beginning of 2014 Hungary has arrived at the verge of a significant decision, strongly determining its development for the next 50-100 years. The doubling of capacity of the Paks Nuclear Power Plant, through its planned expansion, has generated political and communication waves beyond the frames of the energy policy. Giving priority to nuclear energy development exercises its effect on the general economic, social and political setup of the country. The complexity of the issue allows for and explains cause of differing analyses of various dimensions: including discussion of financial, environmental, scientific, technological and ethical aspects of the use of nuclear energy as well as issues related to the desirable energy policy and country development model.

Use of nuclear energy is a reflection of the complex social, economic and political setup of a country, giving an insight into the state, the ambitions and the aspirations of a given society. Conventional analysis of the use of nuclear energy focuses on its scientific aspects, discussing, among others, its physical and technological features. In these cases communication usually spotlights increase of capacity and efficiency, decrease of operational risks and implementation of technological developments. These discussions place the actual operational aspects of nuclear power plants in the center, where the connection between an NPP and its environment is described in an input - output context.

The current dissertation adopts a different approach: it builds on the presumption that a complex set of links exists between an NPP and its environment. In fact, due to its size and characteristics, a nuclear power plant is closely interrelated with its physical, social and natural environment. Decisions on nuclear energy, including capacity increases, life cycle extensions, development or cessation plans imply a range of consequences. Consequently, strategic decisions on nuclear energy cannot be made without thorough consideration of possible aftereffects the changes in the nuclear agenda may bring.

Analysis of the social dimensions of reliance on nuclear energy has been traditionally overlooked; therefore limited understanding is available regarding the effect nuclear energy has on the development of the society. Nuclear energy is an integral part of a complex social economic political system of a given country. The current dissertation claims that the social

discourse on nuclear energy provides a reflection on the state of the society. Communications and behavioral characteristics can be discussed from a general approach and researched from a broad perspective. Deeds and words that are expressed in relation to nuclear energy can be considered as reflections of general attitudinal attributes.

The current dissertation places social dimensions of nuclear energy in the focus. Through the identification, analysis and understanding of actual social discourse the complexity of the issue is represented. Priority is given to analysis of the communication processes as reflections of actual power relations. Study of the actual dominant actors, stakeholders, narratives, argumentations, interpretation of the layers of the content and the actual proceeding of the communication process help understand and describe power relations. It is also expected that as a spin-off of the dissertation, an insight be gained into the operation of the Hungarian political system, the economic and social processes and to the representation of stakeholder interests.

Study of the nuclear agenda may prove representational to what factors influence social discourses in general. *Validity* of the topic, the *interdisciplinary nature* of the topic and the underrated *social dimensions* of the issue give impetus to the choice.

Validity of choice is granted primarily through its topicality. The development of the use of nuclear power in Hungary indicates that by early 2014 the country has arrived at a turning point. Political decisions have been made for the expansion of the Paks nuclear power plant. Consequent discourse arrived at a stage where argumentations about the risks and benefits have become explicit, and indicate that different cohesive narrative structures exist and provide basis for detailed analyses. Findings of the current research may further contribute to the extended discourse through providing information and identifying new angles for a continued discourse. In order to deliver research findings with actual contributory potential, the author has taken the approach of an impartial observer, providing analysis of the social dimensions of the planned extension.

The *interdisciplinary nature of the research* is a reflection of the characteristics of the issue: the actual topic of the use of nuclear energy and of the planned extension of the Paks plant can be assessed from a range of aspects. Once the complexity of the issue is acknowledged, the range of dimensions evidently results in a complex discourse. Argumentations are difficult to match as they focus on different dimensions. Again, this reinforces the prerequisite

approach of an impartial observer that is looking at the overall processes, searching for the key dimensions of the 'big picture'. The intention of the current research is to cross traditional boundaries of disciplines and professions, and to contribute to the development of a new approach by incorporating a range of views, disciplines and narratives. Relevant answers cannot be given through the simplified dimension of any one discipline. This approach of synthesizing various disciplines, however, raises certain methodological challenges. These challenges are handled during the unfolding of the research.

Social dimensions create the framework for the dissertation. Studies indicate that social dimensions of the use and development of nuclear energy are underrepresented in its discourse. Economic, political and technological dimensions dominate the discussions leading to a negligence of considerations of the social context. Bearing in mind both the validity and the interdisciplinary nature of the issue, it is especially important to bring attention to the social dimensions. Acceptance, use and effects of electricity generated through nuclear power have a clear effect on the present and the future generation of Hungary. Views analyzing and reflecting the attitudes, fears, interests, hopes, beliefs and values need to be considered, as important inputs to the formation of the social environment of nuclear power.

### 1.2. The hypothesis

Upon the study of the social context of nuclear energy, the following hypotheses are tested.

- 1. *Political and technological narratives* dominate the discourse about nuclear development in Hungary. The complexity of the issue and the existence of various dimensions and narratives is not reflected in the discourse. Instead of actual discourse, *parallel realities* live by, where narratives do not interact with each other.
- 2. The majority of the population does not have information neither expresses interest in the discourse; therefore it remains on the level of experts and politicians. This is generated by non-interest of the dominant forces in widening the discourse as well as by the inability to build connection between the nuclear narrative and the everyday concerns of the public.
- 3. Due to non-interest in the issue, unbalanced access to information and dominance of political narratives, the *validity of the public sphere theories is limited*. Due to the perceived

political nature of the nuclear issue, public interest remains finite and leads to overlooking dimensions that would affect everyday lives and perspectives.

- 4. Analysis of the communication processes in *the context of perceived risks and benefits* offers a framing to interpret differences in narratives and to understand the European context of the nuclear issue. Perpetual risk benefit assessment would facilitate optimization of decision making.
- 5. Public interest in discourse could be raised through involvement and engagement, where participants gain ownership of the project. *An engagement model* would encourage discourse, and would lead to the development and comparison of alternatives that better reflect the attitudes and ambitions of a significant part of the public. Development of the engagement model and the consequent *democratization of nuclear discourse* could contribute to discussions contributing to the development of the public sphere in modern societies.

### 1.3. Dimensions of the research

The focus period of the dissertation is the four-year span of January 2010 - December 2013, with a further few additional months covered. The full period from April 2009 to March 2014 starts with the parliamentary resolution on starting preliminary preparations for building new nuclear reactors at Paks NPP, and ends with the signing of the government agreement and its parliamentary approval to expand Paks NPP through Russian involvement.

Geographical scope of the current research is a further reflection of a broad approach. While the actual focus in on the Hungarian nuclear agenda, the discourse needs to be interpreted in coherence with its international context. In a globally interconnected world, issues of energy and environment cannot be discussed from a purely national perspective. Long term and sustainable models cannot be based on the limited approach of national views. Especially in the case of a country with a relatively small geographical spread and limited reserves of natural resources; these issues are better analyzed in an international context. The dissertation builds on the assumption that certain core questions and issues related to nuclear energy show cross-border patterns. Study of nuclear discourses in other countries allows for identification of standard motives as well as differing national characteristics. Matching developments in selected European countries allows for better understanding of argumentation. Exploration of international parallels facilitates understanding and interpretation of local processes.

Developing relevant answers to energy, climate and environment challenges may show standard templates in the various countries.

Finally, through this approach the dissertation aspires to contribute to developments in other fields of highly complex nature, involving the vested interests of various stakeholders and with a need of understanding and support from the public. Highly complex, business driven issues, that build on a strong scientific - technological focus and may arrive at the focus of political interest, need further impetus for gaining understanding and developing their social environment. Discourses on issues such as nanotechnology, informatics, biotechnology, genetic modification and space research are all in the forefront. Unless these industries are able to understand, incorporate and handle social dimensions of their discipline, their success will not be granted. Political and business interest may provide them backing, but lack of public understanding and support will always jeopardize development by containing elements of risk.

### 1.4. The methodological approach

The methodology reflects a holistic approach to the research topic. Various layers and dimensions of the discourse on nuclear energy are analyzed through a range of methods, including, to various extents, content analysis, frame analysis, Critical Discourse Analysis, participant observation, statistical analysis, polling, analysis of power structures, social geometry as well as risk - benefit analysis. Information is collected from a range of sciences and practice areas, referring to political, economic, technological, science, communication, social, environmental and philosophical aspects. The complexity of methods and dimensions admittedly reflects the perceived multi-disciplinary nature of the nuclear agenda. Clarification of actual methodological tool is provided within each chapter, to support understanding of relevant findings and statements.

### CHAPTER II: THEORETICAL BACKGROUND

### 2.1. Communication and the public sphere

The existence and operations of the public sphere form the cornerstone of liberal democracy (Habermas, 1962). Habermas argues that it is through the public sphere, building on critical publicity, that members of society, the bourgeios<sup>1</sup> ('Bürger') share their opinion. However, in modern societies, in the social-welfare state critical publicity shows limited validity. Traditional critical publicity is confronted or often subjugated by publicity of manipulative purposes.

In fact, one of the key criteria - and consequence - of a liberal market economy is that of an open public sphere, where the individuals feel responsible for expressing their opinion on issues that matter. The 'reasoning public' takes part in forming public opinion, through representing their individual views. Members of the society find expression of opinions an important tool to represent the separation of public sphere and the state.

Due to political and business pressures and influences, primarily deriving of ownership structures and interests, media loses its ability to convey and represent the discussions of members of the society. It rather contributes to the creation of staged or manipulatively manufactured public sphere, where manipulative publicity serves the possibility to obtain legitimization (Habermas, 1962). All this creates a public sphere where concurrent narratives exist, and the occurrence of the winning narrative is decided by their possibility and power to influence.

It is argued that in fact, since the beginning, the dominance of the liberal public sphere encompassed an exclusionary effect (Fraser, 1990, Eley, 1992). Bourgeois (men) considered themselves to be the only and universal class; therefore their narrative became the dominant account of the time. Their self-representation was extended to the overall representation of the society. The ability to have a dominant role proved significant for their mental and spiritual formation, and this is reflected in their perception about themselves, their self-representation.

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<sup>&</sup>lt;sup>1</sup> Habermas uses the term 'Bürger' which, depending on context, could be translated as bourgeois or citizen. For ease of use the current dissertation uses the term 'bourgeois'.

Habermas is further challenged by claims that the formation of the discourse of the dominant authority naturally goes together with exclusionary mechanisms, including exclusion of prohibited words, the division of madness and the will to truth. This is especially true when groups play a critical and constitutive role in the formation of a given publicity. Use of words are critical as those taking part in the publicity do not share language with those who are of disapproving or protesting positions (Foucault, 1966).

### 2.2. The importance of language

Significance of words in creating sharp differences is argued further (Szabó, 2006). Szabó states that conceptual use of language contributes to the construction of political aliens. Development and use of differing language structures create and reinforce differences and create categories of differentiation or discrimination. Language structures turn supposed intentions into determined actions. Categorization through language structures results in social categorizations and provide interpretational framework for actions. It is also important to recognize that in modern societies, narratives describing significant differences in opinions, often use metaphors related to power: war, enemy, alien. Holders of politically contrasting views are described as political aliens, who can be dangerous, irrelevant or unknown. Perception of difference ensues actual differentiation: 'the political alien is primarily a communication alien, who is alien because of our own perception and that defines our relation to them.' (Szabó, 2006:30)

Facts are especially important upon the study of a subject. Language forms the bridge between facts and the actual text corpus. Language as such therefore is an active agent in constructing social realities. The use of language has an impact on the interpretation of facts and consequently becomes part of the reevaluated, reinterpreted reality. Facts are therefore not a set of objective conditions, structures, institutions, events or activities but 'an objective reality interpreted in the mind, the language and in the text. Empirical is a construction.' (Szabó, 1998:282)

Identification of meaning behind words is a core area for research. Critical discourse analysis examines what relationship exists between casual use of language and social determination (van Dijk 1991, Fairclough, 1995). It is argued that the element of power is essential in the analysis of the actual discourse. Actual discussions always include a power element therefore

they can not be approached irrespective of the social structures they represent. Verbal and written language needs to be analyzed in its social context. Claims prevail that the influence works in both directions: language is a representation of the social structures and language exerts strong effect on social structures.

The previous argumentations imply that issues of potential discourse can be looked upon from two different perspectives. First, they can be the subjects of critical publicity about which individual members of society express their opinion, or they can be the subject of manipulative purposes and serve as a tool of socialization of issues. This possibility reinforces Habermas' claim that the 'sine qua non' of public sphere is the strong division between state and society. However, as Habermas noted some sixty years ago, the emerging 'societalization' of the state, parallel to the growing 'stateification' of society, gradually destroys the basis of the bourgeois public sphere (Habermas, 1962). The state becomes the master of publicity and turns it away of its original function. This results in the state becoming an active influencer of the societal affairs. Social affairs are not any more governed by their own bourgeoisie, but become influenced and then subordinated to interventionism. The re-politicized social sphere brings along the falling apart of the public sphere.

As noted before, 'corporatization' of society can be added to its 'stateification'. Through their advertising power, corporations become prime influencers of media editorial content. Corporate power structures become dominant and media develops into a representational tool for corporate interests and power structures.

### 2.3. The changing nature of media

More and more, media is looked upon as a possible object of investment where owners expect a yield on their investment (Habermas, 1962). First press and later media, including radio and television have become tools for economic activities, where advertisers place and pay for information they want to share with the public. Advertising content is decided by the advertisers, while editorial content is not left intact either. Editorial independence is jeopardized and, in many cases, violated by external influence. The most common factor behind dispensing pressure on editorial material is the consideration of interests of actual or potential advertisers. Influence on content damages editorial independence, and results in selecting, omitting, dedicating preference or disfavor to certain subjects. Along with financial

influence, political influence or simply the desire to please circles considered influential, might disorientate the original editorial intentions.

The upset of separation and balance between state and society results in the decline of the liberal market economy. The growing dominance of the state and corporations consequently means that the dominant narrative is that of the state and corporations, the 'stateification' of the society becomes stronger, centralization and management of opinions takes the place of exchange of opinions. Consequently, 'manufactured publicity' gains a growing role primarily in the field of political communication but also in other areas of public discourse. No longer is the public sphere the ground of exchange of opinions, rather it is the terrain where constructed realities are formed.

Editorial bias can also be noted and is supported by the existence of certain filters (Chomsky and Herman, 1988). It is argued that distortion of editorial content produces in fact a 'propaganda model'. Not only ownership and profit orientation of the media, but also privileged sourcing of media news, fear of retaliation and negative responses, as well as a perceived mission may all act as filters. Editorial independence becomes biased and media owners agree to distortion of reporting to protect claimed public interest and safeguard favors from government and corporations.

Along this process the original position of media changed significantly. In its original form press served as a platform to share vital financial and business news. Information was essential for the actual planning and decision making of economic activities related to finance, trade and, later, industry. Access to information through press guaranteed ability to be part of economic activities and was essential in the maintaining of balance between supply and demand. Growth in influence of the state resulted in a manipulated public sphere taking the place of bourgeois public sphere. More and more, media serves as a means to maintain influence, instead of maintaining balance.

Clear demarcation lines between public and private, and between state and society become blurred. The bourgeois public sphere transformed into a world marked by increasing interweaving of state and society, which ultimately resulted in the influx of the modern social welfare state. The transformation of the media implies that, instead of a series of independent units, it becomes an interwoven complex structure where the primary focus is on exercising influence and keeping power (Benson, 2009)

### 2.4. Content creation versus consumption

It is argued if media content provides a fair reflection of discourse on a given topic. Ambiguities may conflict with common perceptions on how media agendas are formed. The agenda setting theory (McCombs and Shaw, 1972) claims that media does not simply have a descriptive role, but through the selection mechanism of deciding on what it covers, it takes an active role in actually forming reality. From tool of collecting pieces of information, the media message turns into a purposeful mechanism for influencing the public. Especially in the cases where the majority has no first hand experience, the media becomes a significant actor in the construction of reality. Furthermore, it is noted that editors themselves become active producers of news by accrediting news value to certain issues (Tamás, 2000, Török, 2001). Juxtaposed, a contradiction appears between shrinking editorial independence due to influence of current and potential advertisers on the one hand, and the existing ability of media, through its editors, to determine and influence the media agenda and, consequently, the public sphere. It is challenged therefore if independence or dependence of editorial work prevails.

However, this contradiction is superfluous, and it rather forms two sides of the coin. True, editorial content becomes strongly influenced by the existential considerations and, consequently, existential considerations therefore influence the public. Media keeps its ability to influence but moves in the direction of losing ability to create independent content. Media is not any more a forum of exchange of 'critical publicity' of the liberal market economy, but it rather serves as a tool for 'manipulative publicity'.

Fowler (1991) elaborates further by stating that 'anything that is said or written about the world is articulated from a particular ideological position' (Fowler, 1991:10). He claims that independent, unbiased, factual reporting does not exist; the social construction of news is based on bias and not on representation of facts. Identification of elements of bias can be noted by systematic semiotic analysis of text corpuses. This implies that media content analysis would have very limited use in the analysis of actual events, but it would rather give indication how actual events are represented and interpreted by the media. Credibility of reference media is achieved by building on ideas, values and beliefs that, often unconsciously, are carried by the audience of the given medium. This leads to outputs that build on abstract

propositions, which are 'not necessarily stated, and are usually unquestioned, and which dominate the structure of presentation' (Fowler, 1991:2).

Selection mechanisms appear not only from the editorial perspective but also from the perspective of the public. According to the selective exposure theory (Klapper, 1949) the receiver regularly makes a choice between messages. People favor those messages that reinforce their existing opinion and avoid contradictory argumentations. Selection mechanism gives a tangible framework for *text reality* to become *fact reality*, external information consequently serves internal reinforcement. Selective exposure unfolds on three different levels. Selection of sources prioritizes between points of disseminating information. Members of the public tend to follow sources, the information from which is not contradictory to their existing beliefs. Selective perception refers to not noticing other types of information than those that match the existing frame of thinking. Exclusion mechanism automatically eliminates information that would contradict to existing beliefs or knowledge. Finally, selective retention refers to forgetting those pieces of information that may have contradicted to the prevailing line of thought.

Argumentation of Klapper does not entail discussing preconditions of selective exposure. The current dissertation represents the standpoint that certain critical characteristics determine extent of individual selection mechanisms. The dissertation claims that in *complex, multi-layer issues selective exposure prevails more than in simple, linear issues*. Also, personal experience is a decisive factor: selection exposure of information from media is more dominant where there is a *lack of personal involvement and observations*, than in those where first hand information is at hand. Furthermore, *geographical* and *chronological* distance also presumably increases the probability of selective exposure: the further away the given issue is, the more probable is the existence of selection mechanisms.

Klapper could not take into account that changes in and the effects of technology that turn the direction of a prevailing trend. With the exponential growth of internet and social media, the vision of the global village (McLuhan, 1962) becomes reality, and a growing number and proportion of people can connect into and become part of issues of large geographical distance.

Significant changes characterize the primary function of media. Along the commitment to inform, the need and the possibility for entertainment emerge. Sharing information and

providing entertainment results in a new structure of content that allows entertainment elements abound over commitment to inform. Members of the public sphere are not any more the creators of information, but become the consumers of traditional media content.

### 2.5. Internet, social media and the parallel realities

Developments in the field of media deconstruct the classic structure of the Habermasian public sphere of liberal democracy. It is argued (Thompson, 2008) that in the end of the 20th century, mass media, in its original concept, does not exist any longer. Instead of masses there are niche segments, where each group have their own specific communication needs and interests. Thompson (2008) furthermore believes that media are not any more devices to convey information but are instruments that create new forms of action, interaction and relations between individuals. Focus on the interactional characteristics of media support views that the rise of social media is not part of a linear development of the communication sphere, but is part of the reframing of the traditional media construction. While the principles of the Habermas's theory on public sphere still bear their relevance on the criteria for a possible discourse on nuclear issues, however, the actual setting in which the original principles have been framed do not any longer seem relevant.

The arrival and development of new communication technologies pose further significant challenges to the validity of classical public sphere theories (Heller and Rényi, 1996). Developments lead to transformation of role of information: with its power to provide organizational framework to society, information turns into a subject for both sociology and communication theory. Public sphere communication becomes a dominant force for delivering structure to society.

In this process, the exponential growth of internet and social media brought along significant changes. New elements appear, where the base for content creation widens and consumerism of media content is less apparent. Social media and traditional media represent different characteristics, and the issue of authority needs to be reiterated. Exponential rise of the internet and social media brings the opportunity to create, share and indulge individual content. Proliferation of media creates new forum of public sphere, where the difference between creator and consumer of content becomes blurred. Segmentation of the public results in the emergence of issue related multiple publics, where various issues each have their own public, with their levels of interest, knowledge, awareness, and, often differing, views.

It can be stated that these changes exceed the characteristics of organic change and consequently result in the realization of new structures. The level of technological, organizational, cultural and social changes related to the emergence and exponential expansion of new media reaches the extent of categorization of "communication revolution" (Mansell, 2002). It can be argued that the effects of these changes contribute to the restructuring of the social systems, and drive the creation of a new societal structure system, that of the network society (Castells, 2009). The restructuration process of the society in the post-industrial stage is driven by the technological changes and primarily affects the communication processes. With communication having a close connection with the power relations, Castells claims that power relationships are the essence of a society and that "power relies on the control of communication, as counterpower depends on breaking through such control" (Castells, 2009:3). Technological changes and the development of network society bring fundamental changes to the media setup of the industrial society. Interactivity becomes primary in allowing, next to traditional media companies, individual actors to become creators and distributors of information. Mass self-communication is experienced in the proliferation of communication tools with which individual actors can diffuse information over the internet and through mobile technologies, resulting in a massive change in amount, content and structure of shared information. The newly emerged mass self-communication, together with interpersonal communication and mass communication are of complementary character and their coexistence is perceived in the future (Castells, 2009). Nevertheless, its role has had a strong impact on mass communication and resulted in the decrease of the influential power of mass communication.

It is argued that the focus of Castells on the individual user can be extended from the human individual to the organizational individual as well. Organizations, including government, non-governmental, for-profit and not-for-profit, each vie for access to communication with their specific groups and individuals. Consequently, mass self-communication, facilitates empowerment and creates the framework for all stakeholders of the nuclear issue to express views, share information and be part of the communication processes.

Rise of social media gives place to a new kind of relationship between media and their consumer. Through actively taking part in the creation of the content a strong sense of ownership develops. Traditional media represents a one sided structure between a product and its consumers, where the only possibility to influence the media is through changing actual

consumption habits. Social media blurs the line between ownership and consumption of the information. Through the involvement of generating content, actual ownership of the media is shared. Engagement results in a strong sense of attachment where members of the public express ownership over a given subject or topic.

In spite of the changes, remarkable similarities still exist between traditional and social media. Members of the public are selective in what they read, watch or listen to, and accept those sources and contents that fit into their individual constructions of reality. Selection mechanisms prevail in social media: contribution and engagement is represented through the selection of social media sites and forums. Well into the internet era, *choice of media continues to be representational* about the actual member of the public.

Consequently, any media as a source of information is selected upon its ability to reinforce one's existing view. Reassurance is sought to reinforce oneself by avoiding mentally conflicting situations. The cognitive dissonance reduction theory (Festinger, 1957) underlines avoidance to review topics that would require disproportionate energy and time, all leading to creation of considerable inner tensions. This leads to the situation where members of the public look for sources of information and type of content that fit into their existing conceptual framework. Inclusion of new information is only possible as long as it does not break existing frameworks of beliefs and knowledge. This explains the phenomena that 'first-hand' information gains considerable importance, and that social media, a symbol of first-hand access to information becomes a trusted source of information. In the quest for search for information as well as entertainment, new media, including internet sources and social media, not only surpasses but may possibly totally replace traditional media in supplying information.

Based on the combination of constructing reality and selective exposure theories, highly complex issues, lacking personal experience and consisting of various geographical and chronological layers, are interpreted through the construction of parallel realities. Parallel realities strive for the right to represent and gain dominant status in the interpretation of the same facts. As their objectives, parallel realities have construction of reality and the setting up of a valid interpretational framework.

Parallel realities reflect significant phenomena of today's world. With the complexity of subjects to examine, the micro-segmentation of the society and the considerably differing

needs and possibilities to access information, members of the society have differing views on a vast range of issues. In fact, across countries and cultures, people are strongly divided on issues that relate to their individual beliefs, values and aspirations. With the exception of certain meta-level issues and certain basic notions of ethics, morale, law and personal behavior, views on any given issue differ. As underlined before, this is especially true in the case of issues on which most members of the public do not have personal, first hand information, and that are distant in geographical or chronological terms. In case of lack of personal experience, views are generally in line with those who are in a similar group of the society, and usually reflect the interests of the group. Personal, individual value systems are of lower importance in these cases.

Individual construction of reality is influenced by a range of factors. Physical distance, availability of first-hand experience, complexity of the issue are all factors that influence the emergence of 'personal virtual worlds'. Nevertheless the majority of the public constructs reality based upon media information and cannot compare this reality with own direct experience. In the case of complex issues that include a flow of consequent events, where media comes across a modified role: it becomes selective, the balance between representation and interpretation of events changes, its role in independent representation grows and therefore actively takes part in the social construction of reality (Berger and Luckmann, 1966).

### 2.6. Perceived risks and the public sphere

Risk perception forms a dominant element of discourse. As the issue of safety gains prominence in modern societies, perceived risks are lighthouses that set directions for communication, interaction and behavior. Risk becomes the dominant descriptor of modern societies, therefore risk taking ability and risk perception are key factors in social survival and development (Beck, 1992, 2006). It is claimed that survival chances of societies could grow through focus on distribution of risk, instead of distribution of wealth. Arguably, interpretation of risks should not be limited to their technological and natural science contexts, but their social, cultural and political relevance should also be admitted. In order to handle 'civilization costs', science needs to go hand in hand with political, economic and ethical considerations. The concept of risk society builds on the notion of imagined communities (Anderson, 1983), as Beck identifies the factor of risk as the key bonding material of modern communities. This argumentation may challenge the notion of the

'political alien' (Szabó, 2006), where the discursive differentiation is the prime factor of distinction between 'us' and 'them'. Beck emphasizes the universal relevance of belonging to a society based on risk. Risk in his argumentation affects every single member of the society, while the concept of 'political alienism' (Szabó, 2006) would imply that some people are affected by risk, while others are not.

The dissertation offers unraveling of the contradiction, by suggesting that recognition of risk creates strengthened community feelings, while detailed interpretation of risk, with hiding its causes and results, reinforces inclination to differentiate and even antagonize differences. The latter approach lacks the acceptance of shared responsibility and shared consequences, where creation of risks as well as managing its consequences affects every member of the society.

The interrelation between the issue of risk and alienism is demonstrated if groups of people start to become perceived as alien groups, the discourse on dangers and risks intensify. Alternatives are not any more discussed as possible actions with equal chances for decisions, but are differentiated as a clear choice between 'our' alternative that brings benefits and is in the interest of people with whom empathy is expressed, and 'their' alternative that brings dangers, risks and the outcome of which can not be foreseen. It may well be that 'their' alternative serves the interest of groups that are unclear or even diabolic. Consequent fear strengthens further the perception of fear from actors whose intentions are unknown and should be rightly feared of. Differentiation between the known and the alien further intensify developments of selection mechanisms and construction of parallel realities.

The phenomenon of alienation extends beyond the socio-political dimension, and also includes the social - technological dimension. Contrast between safe and secure on the one hand, and unforeseen and full of risks on the other hand becomes an overriding concept for a wide range of technological areas, such as innovations, investments and development models. The social sphere of life is also dominated by preference to what is considered safe and secure: preference for choices in arts, sports, education, health care - or even political parties - is often based on the concept of safety and security.

Finally, it needs to be acknowledged that perception of risk differs considerably. Experts and lay people have contradicting perceptions of risk (Vári, 2009). Experts base their risk assessment on correlations of statistical data, where numeric values provide probabilities of the occurrence of certain outcomes. Nonprofessionals base their judgment on contextual

characteristics, such as the level of fear and level of notoriety. Risk perception is relative and acceptance of risk depends primarily on the trust expressed to the institution managing the given risk (Slovic, 2000).

Fears related to technological progress do not only relate to perceived risks. Awareness exists in the public that technological innovations always bear social consequences as well. Innovations therefore have both a social and a technological dimension. Contrast between these dimensions increase tension and contribute to reluctance to accept or adapt to technological innovations (Felt, Wynne, 2007)

### 2.7. Public sphere in the 21st century

Dahlberg (2005) argues that the Habermasian concept of the public sphere is built on the notion of rationality. Dahlberg furthermore claims that the fulfillment of certain criteria is needed in order to have a reasoned and balanced discourse. However, accommodating such discourses raises issues related to discrimination, because of exclusion of groups that are not able to participate in these exchanges of ideas.

It is also discussed what criteria need to exist to have a reasoned discussion (Dahlberg, 2004). Six criteria are listed as 'normative conditions of the idealized public sphere' (Dahlberg, 2004:13):

- thematization and reasoned critique of problematic validity claims
- the ability for reflexivity
- ideal role taking
- sincerity
- formal and discursive equality
- autonomy from state and corporate power.

Existence of these criteria ensures reasoned argumentation and contributes to the value of communication. It needs to be challenged if the basic conditions of these criteria, *restrain of power and acceptance of the dominance of common interest* can actually prevail. More probably, with the ultimate goal of any communication having the ability to influence, the factor of power cannot be underestimated. Power means better access to information and to information channels, and the ability to represent interests more efficiently. The power

dimension is highlighted strongly in the concept of Critical Discourse Analysis (van Dijk, 1989). CDA supports the notion that communication, power dimensions and the actual social setting have a strong interference. Consequently, it supports the previous thought that participation in the public sphere is limited and ability to take part is deprived of for many stakeholder groups.

In conclusion, analysis of social discourse on a complex issue needs to be addressed through an interdisciplinary approach. Taking a broad perspective allows for interpretation of processes that lay in the background, and may give explanation to why and how certain things happen the way they do. Similarly, in order to interpret actual meaning of communication, analysis of narratives needs to address hidden layers. Along the analysis it needs be born in mind that actors all have agendas they would like to achieve, and to this end are ready to build on the systematic, often manipulative use of language and media. Spread of the internet may create certain limitations to manipulation efforts, however individual selective mechanisms will ensure that parallel realities continue to prevail. Selection mechanisms will exert influence on perception of risks and this, together with the prevailing notion of alienism, will further contribute to the fragmentation of the society. Signals warn that a fully fragmented society may not be able to handle issues of risk, and this poses threats to the future development of societies.

# CHAPTER III: ANALYSIS OF DISCOURSE ON NUCLEAR ENERGY IN HUNGARY

### 3.1. Nuclear energy and the public sphere

Various reasons explain why owners and operators of nuclear energy installations have always avoided being in the forefront of public discussions. First, in technological terms, a possible link exists between use of nuclear power for energy production and for military purpose. The belief is that the less the public knows about nuclear energy, the lower the chance is of military or of other adverse purpose abuse. This in itself is a major driver of limiting transparency of nuclear operations. Second, establishment of a nuclear power plant requires exceptionally high allocation and concentration of financial resources. Usually, due to its strategic significance and exceptional financial needs, the state plays a critical role in relation to nuclear installations. In light of the increased safety measures and consequent costs following the Fukushima accident, the role of state has become incremental on all levels: planning, preparation, financing, providing guarantees, control of building and operations, regulating supplies and waste management as well as training. Complex participation of the state, and especially the need of budgetary commitments, explains political implications of nuclear projects, and has a strong impetus to drip feed information. Finally, due to potential vulnerability, the creation, operations and maintenance of nuclear plants are issues for the security of the state. Full control needs to be exercised to ensure safety of operations and of people.

Avoidance of being in the focus of public discussions has a further possible explanation. Due to the dominance of the political - technological narrative, it is 'trendy' to belong to an exclusive group. It comes naturally to make a distinction between those who have the knowledge about nuclear energy on the one hand, and those who are excluded of it, on the other hand. A *knowledge ownership aristocracy* emerges that bears strong resemblance in its behavior to those who, in political terms, consider everyone else 'political aliens'. Knowledge and conviction in the superiority of technical and technological expertise generates a further limitation in transparency. This significantly contributes to the notion of nuclear energy being *the most exclusive form of energy*, the privilege of a selected group of countries, politicians and experts.

In line with the hypothesis of the dissertation it is believed that as the majority of the Hungarian society has no access or interest in first hand information on nuclear energy, any relevant discourse is based on constructed realities. Discourses themselves also contribute to the creation of social realities. Members of the public lack direct empirical knowledge, therefore reality is replaced by a constructed space, and defined primarily by claimed or authentic experts and decision makers. In the construction of virtual space for nuclear energy, media plays an essential role.

As a consequent phenomenon, a significant part of the public has an opinion about the use of nuclear energy, without actually possessing information about the use of nuclear energy. *Forming opinion without information* reflects intensification of role of beliefs and attitudes. Opinion is not any longer formed based on information, but is a reproduction of the attitudes expressed towards other issues, such as the significance of technological and scientific advancement, attitude and confidence in the state, the general level of trust in institutions and people, as well as environmental awareness.

In summary, social discourse about the use and future of nuclear energy is based on constructed realities, where, together with the indifference of the majority of the public, various actors shape their own interpretation of the situation. Their goal is to position themselves as competent experts, who are then in the position to influence and make the relevant decisions. It needs to be confirmed whether value preferences have a role in defining personal attitudes regarding the use of nuclear energy. The correlation between personal value choices and the views on nuclear energy are sought, to decide whether sympathizing with or refusal of the use of nuclear power is a reflection of personal value systems.

Finally, it is also important to define who has an actual interest in the nuclear issue. The stakeholder concept defines stakeholders not only in the context of curiosity but, in view that the outcome, operations or possible successes and failures of the given organization or program have a strong influence on the given person or group. Stakeholders form a particular segment of the public who have the curiosity as well as the vested interest in the given subject. Differences in the interpretation of nuclear energy are a reflection of the complex structure of stakeholders. It may be argued that stakeholder groups today are a representation of the Habermasian citoyens (bourgeois, Bürger) of the liberal democracies. The significant difference may be that stakeholder groups have the vested interest in the issue with differing

levels of power to exercise influence on the given subject, while the citoyens used to be key influencers and actors in the field of social-political representation of interests.

### 3.1.1. Paks Nuclear Power Plant and the public discourse

In Hungary, the issue of nuclear energy<sup>2</sup> has never been in the focus of public attention or center of debates. The four reactors of the Paks NPP were built between 1969-1987, in the period of a single party rule, with the last reactor being inaugurated a few years before the fall of the communist system in Hungary. In that period, discussions on strategic issues were not overtly encouraged from the dominant political powers. No element of the nuclear life cycle, development and operation of nuclear power plant or handling of the nuclear waste was ever the crystallization point of public debates or anti-nuclear movements. Even events like the Chernobyl disaster in 1986 did not bring to surface any differing views. The only notable exception relates to the issue of uranium mining in Hungary. In the Mecsek mountains<sup>3</sup> significant extraction of uranium deposits took place in the period 1957-1997, and reports depicting serious health hazards reached public awareness. Nevertheless due to the significant economic benefits on the one hand, and limited possibility for any dissent on the other hand, hardly any public questioning of the nuclear agenda appeared.

The fall of the communist system in 1990 and the development of a parliamentary democracy prompted a new setup, where conflicts between or matching of differing interests could develop channels to reach public awareness. The issue of nuclear energy could have been one of the issues for widespread public discussion as nuclear energy is one of the alternatives for meeting the growing energy needs of the economy and society. Apart of the limitations described at the beginning of the chapter, no legal barriers emerged to stop public discussion on use of nuclear energy. As an issue with potentially contradictory aspects, there was a strong chance that it would become an area of intense discourse.

However, for the first 20 years of parliamentary democracy and pluralistic media, it can be demonstrated that the issue of nuclear energy and the Paks NPP did not meet public interest. By and large, public sensitivity about nuclear issues did not prove significant. The only

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<sup>&</sup>lt;sup>2</sup> In Hungary, there are a number of further installations using nuclear energy, including a smaller reactor for educational purposes at the Budapest University of Technology, a research reactor for scientific purposes at the Hungarian Academy of Science as well as various health care institutions. During the dissertation, unless indicated differently, use of nuclear energy always refers to generation of electric power through nuclear energy at the Paks Nuclear Power Plant.

<sup>&</sup>lt;sup>3</sup> Low laying mountain range in the Southern part of the country

exceptions to general disinterest were periods that followed nuclear accidents, catastrophes or breakdowns. The periods following the Paks NPP breakdown in 2003 and especially after the Fukushima accident in 2011 are notable exceptions to general disinterest (MKIK, 2011). Nevertheless, it is clear that even in this case reactions in terms of increased interest and higher refusal rate of nuclear energy, proved temporary only.

### 3.1.2. Developments in the nuclear public sphere between 2010 and 2013

In April 2009 the Hungarian Parliament brought a resolution to start preparatory steps for the expansion<sup>4</sup> of the Paks NPP. A mandate was given to the government to start investigations, to become better positioned to come to a well-founded decision, once expansion is recommended. Following parliamentary elections in April 2010 the new government pursued the mandate granted by the previous parliament.

The following chapters provide an overview on the nuclear discourse in Hungary in the period of 2010-2013. In the detailed study, special focus is directed on the planned expansion of the Paks NPP. Along the analysis, special attention is given to the followings:

- identification of stakeholders and key actors
- description of prevailing narratives
- apperception of framing
- recognition of argumentation structures
- description of confrontation of narratives and development of discourse
- use of communication tools
- confirmation of existence of interpretational layers
- providing feedback on the issue of manipulative public
- signs of reasoning public vs. manufactured publicity

In order to analyze the prevailing narratives in Hungary in the period 2010-2013, three layers of public discourse are analyzed. First, the study of texts of parliamentary debates aim at identifying dominant political narratives related to nuclear energy. Study of parliamentary discourse allows for an in-depth analysis and a thorough apprehension of individual argumentations, as well as overview how narratives may change over periods of time. Second, conflicting professional narratives are studied in texts and information related to the

<sup>&</sup>lt;sup>4</sup> The dissertation distinguishes the expressions of extension and expansion. Extension is used for the life cycle extension of the existing reactors, while expansion refers to development through addition of new reactors.

proceedings of the Aarhus roundtable, a UN originated initiative, promoting transparency of issues with strong environmental relevance. Study of these texts allow for understanding relations and interaction between differing narratives of experts and representatives of stakeholders. Third, the analysis of media articles provides reflections on how the selection mechanism of media operates in the context of nuclear energy, and how differences in political orientation of media are represented in their perception about the nuclear agenda. Analysis of narratives appearing in the media facilitates in-width understanding of the topic, and an understanding of how the media implements its intermediary role. This part also includes a section on the role social media plays in the nuclear discourse.

Synthesis of findings facilitates a comprehensive study of communication processes. Examination of various layers of public discourse not only allow for a detailed analysis and understanding of key players, narratives, arguments, perceptions of interpretation and characteristics of actual discourse, but grant better understanding of processes and how the interpretation of the issue of Paks NPP manifests longitudinal changes.

### 3.2. Political discourse on nuclear energy

Parliaments as institutions offer a formalized framework of political discussions. Analysis of parliamentary discussions provides opportunity for the study, identification and differentiation of argumentations and narratives of key political actors. Members of parliaments as well as political parties are representatives of different electorates and stand for the interests of a range of stakeholder groups. Consequently, analysis of these narratives gives insight to the various layers and dimensions of the nuclear issue. Access to parliamentary debates is granted through online streaming, live TV coverage and the availability of detailed transcripts of the parliamentary sessions. For the purpose of study of argumentations, transcripts of sessions dealing with nuclear energy have been examined. Overview of a period of over 3 years allowed elimination of overrepresentation of eventual factors and facilitated the diagnosis of overall trends.

### 3.2.1. Methodology

Plenary sessions of the Hungarian Parliament of the period October 2010 - December 2013 have been analyzed, using the tools of content analysis. Transcripts of parliamentary plenary

sessions<sup>5</sup> were coded and analyzed to study nuclear energy related political discourse. All texts have been considered that included the term 'nuclear energy' or 'nuclear'<sup>6</sup>. First, all transcripts were categorized according to their elements of identification. Identification allowed quantitative assessment of the political discourse through affirming critical numbers and distributions among speeches.

Identification coding was done according to the following criteria:

- name of MP
- MP's party affiliation
- date of speech
- law on the table

Identification was followed by contextual analysis to specify the presence and meaning of nuclear energy related terms. Contextual analysis allowed for the qualitative assessment of the individual and the aggregate text corpuses.

Contextual coding was built on the following criteria:

- reference made in speech to the speeches of MPs from other parties
- key words
- key message
- risks mentioned in relation to the expansion of the Paks NPP
- benefits mentioned in relation to the expansion of the Paks NPP
- specific reference implying relation to power

### 3.2.2. Trends in addressing the nuclear issue

### Discussions on bills related to nuclear energy

Deliberation on nuclear energy took place in relation to discussion of relevant bills, or through the raising of direct questions. Most frequently the contributions were made when a law, directly effecting and regulating nuclear issues, was discussed (Table 1). The

<sup>5</sup> Transcripts are available and researchable from the website of the Hungarian Parliament: http://parlament.hu/internet/plsql/internet naplo

<sup>&</sup>lt;sup>6</sup> In Hungarian these are covered by 2 distinct terms: *atomenergia* and *nukleáris*. Technical contributions, such as the speaker of the house reading out the name of the legislation before voting, were omitted.

modification of the nuclear law in 3 stages, the modification of the energy law in 2 stages, the debate and elaboration of the national energy strategy and the reports of the safety aspects of the use of nuclear energy dominated the scene. A significantly lower number of comments were recorded when the social - environmental setting of nuclear energy was regulated. These references included the proposal on the public access to information in relation to the planned Paks expansion, modification of the law on mining, the national framework strategy on sustainable growth and the modification of law on spatial planning.

name of law	name of law in Hungarian		dates of discussion	number of addresses
modification of law on nuclear energy	Az atomenergiáról szóló 1996. évi CXVI. törvény módosítása	T/3288	6/8-27/2011	21
energy strategy	A nemzeti energiastratégiáról	H/3839	9/13 - 10/3/2011	17
report of safety of nuclear operations	Az atomenergia 2009., 2010. és 2011. évi hazai alkalmazásának biztonságáról szóló jelentés elfogadásáról	H/9949	2/12/2013	16
law on nuclear energy	Az atomenergiáról szóló 1996. évi CXVI. törvény módosításáról	T/9235	11/27/12	10
law on nuclear related issues	Az atomenergiával, valamint az energetikával kapcsolatos egyes törvények módosításáról	T/11101	11/27/12	9
modification of certain energy related laws	Egyes energetikai tárgyú törvények módosításáról	T/13055	11/19/13	5
public access to information on Paks expansion	A paksi atomerőmű bővítésére vonatkozó döntésben való társadalmi részvételről és az előkészítéssel kapcsolatos adatok teljes nyilvánosságáról	H/4114	11/14/11	4
mining law	A bányászatról szóló 1993. évi XLVIII. törvény módosításáról	T/6589	4/11/112	4
modification of certain energy related laws	Egyes energetikai tárgyú törvények módosításáról	T/9245	11/27 - 12/09/12	3
strategy on sustainability	A Nemzeti Fenntartható Fejlődés Keretstratégiáról	H/9064	2/26/13	3
modification of law on spatial planning	Egyes törvények területrendezéssel összefüggő módosításáról	T/12910	11/27/12	3
energy law modification	Az energetikai tárgyú törvények módosításáról	T/1941	12/21/2010	2

Table 1: Proposed acts related to nuclear energy

### Distribution of addresses

In the parliamentary term studied, the following parties were represented in the Hungarian Parliament: Fidesz (government, conservative), KDNP (government, conservative), MSZP (opposition, socialist), Jobbik (opposition, national radical), LMP (opposition, green) and

PM<sup>7</sup> (opposition, green). Representatives of each political party contributed (Table 2) to the parliamentary discourse on nuclear energy<sup>8</sup>.

party	number of addresses
LMP	46
Fidesz (government)	28
Jobbik	26
Fidesz	24
MSZP	23
KDNP	9
KDNP (government)	4
PM (independent)	2
TOTAL	162

Table 2: Number of parliamentary addresses on nuclear energy

Of the 162 addresses dealing with the issue of nuclear energy, MPs of LMP commented most frequently (46 occasions), followed by government representatives (28), Jobbik (26), Fidesz (24) and MSZP (23). Comments were most frequently made by Bernadett Szél (LMP, 18), Benedek Jávor (LMP), István Józsa (MSZP) and Lajos Kepli (Jobbik) (12 each), while other advocates included János Fónagy (government, Fidesz) and László Szilágyi (LMP) (11 each).

name	year of birth*	profession*	party	number of addresses	critical / supportive to Paks expansion
Bernadett Szél	1977	economist, sociologist	LMP	18	C
István Józsa	1953	engineer	MSZP	12	S
Benedek Jávor	1972	biologist	LMP	12	С
János Kepli	1978	engineer	Jobbik	12	S
János Fónagy	1942	lawyer	gov. (Fidesz)	11	S
László Szilágyi	1965	teacher	LMP	11	С
András Aradszki	1956	lawyer	KDNP	7	S
Pál Kovács	1963	engineer	gov. (Fidesz)	7	S
János Bencsik	1965	theologian, sociologist	Fidesz	7	S
István Göndör	1950	economist	MSZP	6	S
Ferenc Tóth	1950	engineer	Fidesz	5	S
Zoltán Balczó	1958	engineer	Jobbik	5	S
János Bencsik**			government	+4	C/S
Benedek Jávor**			PM	+2	С
				113	

Table 3: MPs contributing most frequently to the discussion of nuclear issues

\*\* The 31 December 2011, State Secretary of Energy János Bencsik left his government position, while in February 2013 Benedek Jávor quit LMP and became co-founder of PM

<sup>\*</sup> Source: www.parlament.hu

<sup>&</sup>lt;sup>7</sup> PM was formed In February 2013 following breakaway from LMP. Its deputies became independent members of the Hungarian Parliament, as members could not form faction.

<sup>&</sup>lt;sup>8</sup> In the case of parties in the government, there is a separate indication to addresses made as the party representatives or delivered on behalf of the government.

Analysis of the background of frequent proponents of nuclear issues allow for certain observations. It is worthwhile noting that Prime Minister Viktor Orbán and State Secretary of Environmental Protection Zoltán Illés touched upon the issue of nuclear energy only once each. The political discourse on nuclear energy is dominated by engineers (41 speeches of the 119). The contribution of economists and sociologists is also significant, while the profession of biologists, teachers and theologians is represented by one person each. The politicians of LMP show a cohesive pattern of criticism in relation to nuclear energy. LMP politicians are younger than the average, are of social science, humanities, economics and natural science background, and it ranks the only active woman politician of the nuclear discourse. These numbers have indicative significance and do not grant authenticity to quantitative conclusions. However, based on these indications, women, younger people and those with social science, humanities, economics and natural science background seem more likely to express critical views against nuclear energy than the older generation, men and with engineering background. Furthermore, their critical approach is broader, and looks at the issue of nuclear energy not only from an operational perspective, but considers it to be part of a complex socio-environmental framework.

### Referencing in speaking

Occurrences were then analyzed where MPs would make direct reference to a remark made by another member of the parliament. These references give indication on narratives changing into discourse, and reveal intention to turn monologues into dialogues or even streams of communication. LMP made 15 such references, followed by Jobbik (10) and MSZP (7), while government (3) and the Fidesz (2) lagged behind. Figures imply that referencing and reacting to allocutions is exercised by the opposition parties, the government and its parties rather refrain of referencing. This phenomena can presumably be the reflection of standard parliamentary structures, where governments and government parties see their role as presenters of bills while opposition parties need to reference and position themselves against the government and often against each other.

### Relevance of parliamentary speeches

Relevance of parliamentary speeches was designated according to how direct their focus on the Paks expansion had been. All allocutions were categorized to see their direct relevance as follows (Table 4). Category 3 includes contributions with a focus on the future of nuclear energy in Hungary and the planned expansion of the Paks NPP, category 2 refers to speeches with focus on other aspects of nuclear energy, while category 1 is attributed to those speeches that have remarks on nuclear energy but their focus in actually on another field.

	1	2	3	TOTAL
LMP	15	16	16	47
Government (Fidesz)	8	13	7	28
Jobbik	8	12	6	26
Fidesz	7	12	5	24
MSZP	11	8	4	23
KDNP	1	5	2	8
Government (KDNP)	1	1	2	4
PM	-	1	1	2
TOTAL	51	68	43	162

Table 4: Parliamentary addresses and their relevance to Paks development plans

LMP shows an even distribution of speeches combining a direct and an indirect approach to the subject. Analysis of MSZP remarks show that socialist MPs touched nuclear related issues with indirect aspects, and showed limited relevance to the actual expansion of the Paks NPP. Fidesz, KDNP and Jobbik as well as the government preferred to discuss areas with nuclear relevance but that were not directly related to the future development plans of Paks NPP. LMP exploited every possible opportunity to tie to the nuclear issues and deal with every aspect. Their strategy can be characterized as that of *full front approach*. MSZP preferred not to be involved with direct nuclear development issues, therefore their strategy can be described as *avoidance*. Fidesz, KDNP and Jobbik as well as government opted for restraint from positioning development plans as the actual focus of nuclear issues. Their strategy can be described as a drive for *re-direction*.

### Immediate questions

Immediate questions to the government are reflections of issues raised by members of the parliament and addressed to members of the government. During this period 4 questions were raised in relation to nuclear energy, all by politicians of LMP. These questions concerned planned action of government following the Fukushima disaster, results of the stress tests of the Paks NPP and the repeated enquiry into how much the recovery of the Paks breakdown in 2003 did cost to Hungarian taxpayers.

## 3.2.3. Risk and benefit narratives in parliamentary addresses

#### Distribution of risks

In the context of analysis of risks and benefits the dominance of certain issues is notable.

	cost	safety	lack of public control, information	lack of sustainability	past record	leaves no space for renewables	budget	handling of	TOTAL
LMP	5	4	3	1	2	1	1	-	17
Fidesz	1	-	1	1	_	-	-	-	3
Jobbik	-	1	-	_	_	-	-	1	2
TOTAL	6	5	4	2	2	1	1	1	

Table 5: Occurrences of mentions of nuclear related specific risks

The issues of cost and the non-transparency of budgetary aspects, followed closely by the concerns of operational safety, dominate the discourse on risk (Table 5). The third significant area of concerns is related to issues of lack of public control, unclear role of authorities and questions related to information and management. Lack of sustainability and its negative effect on development of renewable energies are also mentioned. Risk perception and discourse is dominated by representatives of LMP, in fact its politicians were the only ones to present solely risk aspects. 2-2 speeches each from Fidesz and Jobbik MPs refer to risks as well as benefits, while MSZP and KDNP representatives as well as government members do not touch on risks at all.

The analysis shows that the risk perception of LMP is especially high on the issue of costs, safety and on lack of information and public control. Past records, time and budget overruns as well as doubts about sustainability also prevail in their narrative. To a much lesser extent, Fidesz is aware of risks related to costs, lack of publicly available information and sustainability, while Jobbik mentions possible risks in relation to handling of used fuel rods and safety. LMP represents a *comprehensive* risk awareness model, where financial, managerial, environmental and political issues all abound. Fidesz represents *selective* risk perception where certain risk elements random appear. Jobbik has an *occasional* risk perception, related to its claimed expertise in technological aspects. Government members did not touch upon any of the risk elements in the given period.

## Distribution of benefits

	environment, clean energy	cost, cost efficiency	supply security, reliability	safety, professional control	energy independence	TOTAL
gov. (Fidesz)	4	3	3	3	-	13
Jobbik	4	3	2	-	-	9
Fidesz	3	1	2	-	1	7
MSZP	1	2	_	1	1	5
KDNP	<del>-</del>	-	_	1	-	1
TOTAL	12	9	7	5	2	

Table 6: Occurrences of mentions of nuclear related specific benefits

In terms of benefits, the dominant framing is provided by the positive effects on the environment through decarbonization, followed by cost efficiency and claimed low cost as well as security of energy supply (Table 6). Safety of operations and reduction of dependency on energy imports are also mentioned. Narratives on benefits are lead by Jobbik (7 mentions), followed by the government (5), Fidesz and MSZP (4 each). KDNP contributes with 1 argument for the benefits, while LMP deputies do not touch on any benefit in their speeches.

The benefit mapping of the parliamentary parties provides a relatively even spread. With the exception of LMP, all other parties mention certain or several benefit elements. With the highest number of mentions, government representatives emphasize benefits the most. Jobbik perceives environmental effects, cost factors and the energy supply security as main benefits. Fidesz and MSZP perceive an even distribution of various benefit factors.

## Overall assessment of risks and benefits

In overall terms, mapping of risks or benefits provides an insight into the perception of nuclear energy of the given political party. Priority to risks reflects concern for the expanded use of nuclear energy, while focus on benefits underlines anticipated advantages. The balance of risks and benefits provide an indication if the actor is rather of supportive or of opposing views regarding the expansion plans of the Paks NPP.

Risk theory elaborates that risk is an element measured by the probability and the impact of the occurrence of a given event. The higher the likelihood of the occurrence of an event to happen, and the higher the impact of the manifestation of the given event, the higher the consequent risk is. Risk relationship is expressed as: Risk = Impact x Probability.

Of the two factors, analysis of texts testifies that politicians primarily focus on impact and neglect assessment of probabilities. Supposedly, description of impacts serves communication and political purposes better than probabilities. Furthermore, emphasis on impact is in line with the overall approach that builds on the significance of the social-environmental factors. On the other hand, discussion on probabilities rather refers to occurrence of events directly related to operations. This observation on risk perception in political discourse supports the statement that within the risk formula in general terms, the impact of the danger, consisting of size and controllability is considered of bigger importance than the probability of its occurrence (Bauer, 1995).

## Balance of risks and benefits: the Risk Perception Index

Introduction of an indicative figure can be drawn based on the difference in number of mentions of benefits and risks (Table 7).

	government	Jobbik	MSZP	Fidesz	KDNP	LMP
risks	0	2	0	3	0	17
benefits	13	9	5	7	1	0
BALANCE (risks-benefits)	-13	-7	-5	-4	-1	17

Table 7: Balance of risks and benefits based on nuclear related parliamentary addresses

The difference provides an indication of how actors see the relationship between risks and benefits and gives an insight into individual risk perceptions. The Risk Perception Index can also be perceived as an overall reflection of the attitude towards nuclear energy development plans. Bearing in mind that supporters tend to emphasize benefits over risks, while opponents usually put focus on risks ahead of benefits, the balance of benefits and risks gives manifestation to levels of support or dissent to the expansion project. Based on the Risk Perception Index, the most ardent supporter of the Paks expansion project is the government, followed by Jobbik, MSZP and Fidesz, while the only and notable critic of the nuclear project is LMP.

It is argued that the continuous assessment of risk and benefit factors in the discourse would allow creation of a *permanent Risk Perception Index*. The index could accommodate longitudinal variations, emergence of new risk and benefit elements and consequently reflect risk awareness of the political actors. Responsible approach to the nuclear discourse would embrace this indicator that provides input to possible future actions.

# 3.2.4. Reference to power relations

Once the differences between parties in relation to their nuclear energy attitudes are noted, it is worthwhile to identify language structures of political actors (Table 8). As a standard, political argumentation serves 2 purposes: it is an attempt to convince other parties and / or the government of an actual position, and, perhaps more importantly, it is a demonstration to the public sphere that the actual political party represents the interests of its electorate. Language structures may provide in-depth explanations for political standpoints regarding the issue of nuclear energy as well as views on actual electorates.

name	date	quote (in English, with Hungarian original)	category, reference to power relations
János Bencsik, Fidesz (gov)	6/8/11	we are speaking about the replacing of existing capacities, and not about expanding additional capacities / a meglévő paksi kapacitások kiváltása kapcsán tehát nem kapacitásbővítésről, hanem a meglévő kapacitások kiváltásáról beszélünk	political turnpoint, first reframing of the issue
István Göndör, MSZP	6/8/11	let us create a positive public atmosphere and acceptance to the expansion / a bővítés lehetőségéhez teremtsünk megfelelő társadalmi hangulatot és elfogadottságot	misuse of terminology on purpose
Benedek Jávor, LMP	11/14/11	it is democracy that needs debate, including potentially a referendum, and not the issue of nuclear energy or renewables / a demokratikus vita lehetőségét, ideértve adott esetben a népszavazás kiírását is ebben a kérdésben, az Országgyűlés nem a megújuló energiaforrások támogatása érdekében, nem az atomenergia elutasítása érdekében, hanem a demokrácia érdekében támogassa.	reframing the issue at stake
András Schiffer, LMP	6/18/12	we should be grateful that they are not forcing in the nuclear law into here / még jó hogy nem az atomenergia törvényt szuszakolják ide be	nuclear issue as a symbol
László Szilágyi, LMP	6/28/12	Instead of dealing with this, the government is dreaming about new nuclear reactors / Ahelyett, hogy a kormány ilyesmivel foglalkozna, új atomenergia-blokkokról álmodozik	discrediting the other party, minimize and ridicule their activity
Pál Völner, Fidesz (gov)	11/19/12	One of the key guarantees of nuclear energy safety and social acceptance is the transparency of related activities / Az atomenergia-alkalmazás biztonságának és társadalmi elfogadottságának egyik legfontosabb garanciája a kapcsolódó tevékenységek átláthatósága. /	hypocritical, trivial statement
Bernadett Szél, LMP	11/19/12	Fidesz does not understand, perhaps it lacks this in its inner culture, that inclusion of stakeholders is not something unnecessary, but rather the opposite / Fidesz nem érti, talán azért, mert ez a párt belső kultúrájából hiányzik, hogy az érintettek bevonása a döntésbe nem valami fölösleges dolog /	discrediting the other party, generalization
János Fónagy, Fidesz (gov)	11/26/12	The new reactor(s) are fundamentally necessary for maintaining the energy security of the country / Az új atomerőművi blokk, illetve a blokkok létesítését az energiaellátás biztonsága szempontjából alapvetően szükségesnek tartjuk.	political turnpoint
Ferenc Tóth, Fidesz	11/27/12	social control does guarantee safety / a társadalmi ellenőrzés garantálja a biztonságot	hypocritical, trivial statement

Lajos Kepli, Jobbik	11/27/12	It would be worthwhile to check, before taking to underground storage, what radioactivity these wastes have at all, after being stored for years on the surface / Érdemes volna egyébként visszamérni, mielőtt a végleges tárolóba leszállítják majd ezeket a hordókat, hogy mégis milyen radioaktivitással rendelkeznek jelenleg, miután már több éve a felszínen vannak tárolva	minimization of problem, attack instead of defense
István Józsa, MSZP	11/27/12	MSZP supports life cycle extension / az MSZP támogatja az élettartam hosszabbítást	political turnpoint, change in party policy
János Bencsik, Fidesz	2/12/13	nuclear safety needs to enjoy utmost priority against any other partial interests / a nukleáris biztonságnak minden egyéb részérdekkel szemben elsőbbséget kell élveznie	political turnpoint, change of emphasis
Lajos Kepli, Jobbik	2/12/13	The iodium contamination did not cause any health hazard, and only served for the anti-nuclear circles and lobby to create panic for practically nothing / az Izotóp Kft. által kibocsátott jódszennyezés újabb alkalom volt az atomenergia- és a sugárzóanyag-felhasználást ellenző erőknek, köröknek, lobbinak, hogy pánikot keltsenek, úgy gondolom, hogy szinte feleslegesen. /	minimization of problem, attack instead of defense
Bernadett Szél, LMP	2/12/13	nuclear energy keeps generating problems that today's economy and society can simply not handle / a nukleáris energia mint olyan a mai napig olyan problémákat termel ki, amellyel a jelenkor társadalma, gazdasága nem tud egyszerűen mit kezdeni /	nuclear issue as a symbol
Bernadett Szél, LMP	2/12/13	Nuclear energy is present in every home / Az atomenergia minden otthonban jelen van /	nuclear issue as a symbol
Pál Völner, Fidesz (gov)	6/3/13	If the distinguished MP had not only focused on keeping contact with the Austrian green party reps during the visit at Paks, obviously he could have received much more detailed pieces of information / Ha a képviselő úr a paksi látogatásán nem csak az osztrák zöldekkel tartotta volna a kapcsolatot, nyilván sokkal részletesebb információkat is kaphatott volna /	discrediting the other person, speaking from up to down
János Fónagy, Fidesz (gov)	10/28/13	Dear Ms. MP, please relax (laughter and clapping from government benches). You will receive an answer to every rational question of yours. / Tisztelt Képviselő Asszony! Kérem, nyugodjon meg. (Derültség és taps a kormánypártok soraiban.) Minden racionális és megválaszolható kérdésére választ fog kapni. /	discrediting the other person, speaking from up to down, sexism
Viktor Orbán, Fidesz (gov)	12/2/13	I am happy to tell you this, but if you had prepared before your speech, you could have read it for yourself / szívesen elmondom most önnek, de ha az interpellációja előtt utánanéz, akkor ezek mind olvashatók /	discrediting the other person, speaking from up to down

Table 8: Quotes with references to power relations

Categories and reference to power relations prove that political language is in deed an important tool in creating reality. Framing of the issue of nuclear energy is accomplished through the use of specific language. Transcripts do not provide detailed information on emotions, but indications show that emotional content adds significant elements to the language construction. In the political context, language serves the purpose of winning over the other. Choice of words and manufacturing of sentences show self-confidence, awareness of self-importance and significance dedicated to the issue. In certain cases missionary commitment, careful distancing or even skepticism is felt. Whichever way it is, choice of

language is not accidental, it is a representation of the individual and group (party) attitude to the issue of nuclear energy. The common practice of referring in speeches to structural and personal relations between the speaker and the addressed person reinforces a number of concepts described earlier. It indicates that in the political nuclear discourse the concept of political alienism is notable, the interpretation of communication come across as an often unbalance relationship setting between the various actors, and that the description and up keeping of nuclear energy as an exclusive form of energy and science, requiring unique competencies and rights, all prevail.

## 3.2.5. Conclusions of political discourse

Analysis of political discourse on the nuclear agenda indicates diversity of strategies, narratives and uses of language. Detailed text analyses allow summarizing certain key findings.

- 1. Individual narratives are influenced by personal background, party affiliation and perceived interests of the electorate.
- 2. Communications is *situational* and content and style of narratives vary over time in relation to change in strategy, focus, situation and audience.
- 3. Most of the addresses are monologues and do not refer to contributions from others. However, when reference is made, it is usually *confrontational*. Contrasting or even alienating is not only reflected in differing contents, but in construction of language and tone attempting to *minimize*, *ridicule*, *discredit* or *speak down* on someone.
- 4. Nuclear communication strategies of political parties show three distinct approaches: *full front approach* to include nuclear aspects of all possible issues, *avoidance* that attempts not taking sides on this issue and *re-direction* that, within the nuclear framing, places focus on other aspects with the purpose to define the dominant framing and to rule the discourse.
- 5. Each actor, including the political parties and the government has its distinct risk and benefit awareness footprint. Introduction of the *Risk Perception Index* facilitates having a clear indication of the dimension of these differences.
- 6. Political nuclear discourse is based to a considerable extent on building and using *power relations*. Consequently it underlines our earlier hypotheses about the emphasis of the exclusivity of nuclear power and about its perception as a reflection of power of a country and its people.

#### 3.3. Professional discourse on nuclear energy

## 3.3.1. The Aarhus initiative

The professional field offers an essential layer of interaction on nuclear energy. Exclusion of political players and of the media allows for a direct presentation of often conflicting views on nuclear energy. An important forum to challenge opinions on nuclear issues is the Aarhus roundtable. The actual analysis of the communication processes within the Aarhus roundtable was important to study actual direct exchange of information related to nuclear energy.

The Aarhus roundtable started as a pan-European initiative to promote transparency of issues with strong environmental relevance. The Aarhus Convention, signed on 25 June, 1998, adopted by the United Nations Economic Commission for Europe, establishes a set of rights for the public to become part of significant processes with environmental relevance. The three cornerstones of the convention include 'everyone's right to receive environmental information that is held by the authorities, the right to take part in environmental decision making and the right to review procedures to challenge public decisions not respecting the aforementioned rights'. Usually these are described as the three access rights: to information, to participation and to justice. The national roundtables have the task to monitor, influence and report on the national execution of the Aarhus Convention. In short, the Aarhus roundtable ensures public participation in decision-making in the environmentally sensitive areas, most significantly the nuclear domain.

#### The Aarhus roundtable in Hungary

In many of the EU member countries, the nuclear energy is the field where access to environmental information is the most critical. In Hungary, among others, the activities of the national Aarhus roundtable focus on planned and existing nuclear projects (Table 9). Being the largest single investment with strong environmental relevance and with pressing need for transparency, the planned extension of the Paks NPP was put into the focus of the work of the Aarhus roundtable. The national Aarhus roundtable set as objectives the creation of guidelines and recommendations to improvement of communication processes, contribution to informed decision making as well as initiation, monitoring and interpretation of legislative changes.

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<sup>&</sup>lt;sup>9</sup> European Commission, <a href="http://ec.europa.eu/environment/aarhus/">http://ec.europa.eu/environment/aarhus/</a>, accessed 26 February 2014

In terms of work structure, meetings of involved actors serve for identification of issues, recognition of barriers, agreement on scope of work and on outcomes, as well as to discuss and approve drafted materials. Their usual schedule for convening is once a year. The working group acts as a body that provides input, and elaborates and presents proposals to the roundtable. Its usual schedule for meetings is 3-4 times a year. The structure encourages dialogue between members and between sides. Search of consensus is advocated by the decision-making procedures. However, unanimity poses risks by limiting flexibility and efficiency of group work. Equal voting rights reflect democratic principles, but hide differences between members in terms of informal and formal power, access to information, resources and actual weight. In 2009, the setup of the roundtable was created to accommodate all stakeholders. Members, upon application and acceptance, are designated to represent one of the following four sides: licensees, government and authorities, NGOs, academics and others. The four sides form equal right partners where decisions are made through unanimous decision making of the sides, while the vote of each side is based on the majority voice of its members (for list of members of roundtable and of working group see Annex 1).

date	event	key decisions
2009	working group is established to prepare setting up of Aarhus roundtable in Hungary	
7 May 2010	1st meeting of Aarhus roundtable	•adopts mandate to act as a forum for dialogue •gives mandate to ad-hoc working group (WG) to elaborate documents for next convention of roundtable
4 May 2011	2nd meeting of Aarhus roundtable	•accepts Modus Operandi, defining operating and voting procedures •accepts Protocol on Access to Environmental Information •does not agree on Definition of Emissions and refers back to WG for further work •gives mandate to WG to elaborate Protocol for Public Participation in Authority Licensing Procedures
12 Dec 2013	3rd meeting of Aarhus roundtable	•accepts Paks 2 as new member •accepts Definition of Emissions •postpones acceptance of Protocol for Public Participation and seeks further input to existing proposal •seeks report and presentation from Paks 2 about planned expansion of Paks NPP
20 Feb 2014	4th meeting of Aarhus roundtable	•listens to presentation of CEO of Paks2 on technological aspects of Paks NPP expansion •NGOs announce suspension of membership in roundtable and in working group due to lack of access to actual relevant information

Table 9: Key milestones of Aarhus roundtable development

#### 3.3.2. Methodology

To study deliberation within the roundtable, a specific approach was taken. The method of participant observation was adapted to study and interpret group dynamics, and to arrive at conclusions that comprise observations on attitudes related to the issue of nuclear energy and the public sphere. Participant observation is 'the systematic description of events, behaviors, and artifacts in the social setting chosen for study' (Marshall and Rossman, 1989:79). Observation allows to note nonverbal expressions and to determine directions, intentions and style of communication (Schmuck, 1997). As for the exact role of the observer, of four theoretical options, a position needs to be chosen (Gold, 1958):

- complete participant, member of the group, actually hiding their role as observer
- participant as observer, member of the group and everyone is aware of their role as researcher
- observer as participant, not an actual member of the group however the group is aware of the observation activities of the researcher
- complete observer, not a member of the group, in fact the group is not even aware of the presence or observation activities of the researcher.

Clearly, there are limitations to the extent participant observation can be used. The observer faces the challenge of becoming attached, even emotionally involved with the actual subject of observation (Paul, 1953). Even tensions can be noted between observation and participation (Tedlock, 1991). A dilemma often encountered is clearly the descriptive nature of the findings matched against the need for 'scientific results' (Devereux, 1967). Participant observant faces possible ethical challenges as well.

In the case of the Aarhus roundtable, for choice of role, limitations and specific conditions needed to be considered. Overall, the essence of participant observation was found suitable, as it allows the observer to become part of the group and acquire knowledge by being physically present in the process. In the current research, the author became involved in the roundtable as an invited moderator<sup>10</sup> to ensure the smooth running of the operations of the roundtable. Upon introduction, the author expressed satisfaction of being involved and contributing to the efficient functioning of the process, but also sought agreement to use observations and the accessed information for research purpose. Members of the roundtable agreed, with the notion

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<sup>&</sup>lt;sup>10</sup> The author of the current dissertation was invited to take over the role of moderator following the retirement of the previous moderator

of underlining sensitive nature of certain elements of the information. However, in line with the mission of the roundtable, to provide access to environmental information, the agreement was granted. The actual role of the moderator in this process can best be described as the participant as observer: being an active member of the group while making clear their role as observer.

During the planning of the observation process and for the designed outcome of the research certain limitations had to be considered:

- the Aarhus roundtable is not a permanent social or business structure, members spend limited time with the group, while considerable time spans separate meetings
- these limits induce that there is not much opportunity for development of a standard group culture or behavior patterns
- instead of characteristic group patterns, it could be presumed that rather the differences dominate, where each member represents its organizational behaviors and attitude patterns
- observation opportunities are limited in terms of occasion and time, and therefore limit validity of conclusion of observations<sup>11</sup>. Observations cannot be turned into quantitative statements with statistical validity but serve as indicative reflections.

Observations were made by taking detailed notes, while conclusions are drawn based on personal notes and by official transcripts of meetings and official correspondence among roundtable members. During the participant observation process the author paid specific attention to maintain balance between three considerations. First, the actual moderation of the meetings as well as the interim processes had to be ensured. The moderator was in charge of facilitating the actual information flow, and maintaining consistency of operations and responsibilities also included securing involvement and engagement of attendees. Second, a range of non-rational factors had to be considered, and a set of skills, most importantly facilitator competencies, was needed to smoothen the process at certain critical points. The author pursued dialogue and actual decision-making as priorities in mind, even to the price of not having optimal decisions made. Finally, the author had to make sure that his involvement in actual discussions is limited, as this could have harmed both missions: curator of the moderation procedure and observer of the communication process.

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<sup>&</sup>lt;sup>11</sup> In the period April 2013 - December 2013 author took part in 1 roundtable meeting and 2 working group meetings. Transcripts of further 2 roundtable meetings and 1 working group meeting from the period May 2010 - March 2013 were also analyzed. Later, a further roundtable was attended in the additional period in February 2014.

The key question for study was whether the forum actually meets the criteria ensuring transparency, and if participants interpret their role accordingly. The communication flow is analyzed by looking at various angles, and analyzing it from the different perspectives.

## 3.3.3. Findings of research

Findings are based on the qualitative and quantitative assessments of the individual interventions and of interactions made at the meetings on behalf of the representatives of the members.

#### Communication roles

Energiaklub and EMLA are the regular initiators of new directions of communication. The initiatives of these NGOs are twofold: they build on international best practices with the purpose of possible adaptation in Hungary, and they address establishing practices and procedures beyond those legally binding.

Most frequent communication role: initiator

Quote: 'The task of the roundtable is to dissolve delays between actual development and flow of information' - EMLA, 13 June 2013

In most cases licensees, specifically MVM Hungarian Electricity Ltd., Paks NPP and Paks 2 are addressed by these pieces of initiated communication. Reactions from licensees are often defensive, declining or diverting. In cases, reference is made to lack of delegated official responsibility, authorization and obligation, or to the existence of other, substituting tools. At the same time, licensees voice initiatives encouraging extended public use of existing channels to obtain information, and be part of standard processes for public involvement.

Most frequent communication role: reactive and initiator

Quote: 'We can support those plans of the roundtable that do not disturb the business processes' - MVM, 7 May, 2010

Involvement of government and authority representatives show a diverse picture. Activity level of the Ministry of Rural Development is high, responding and even initiating procedural and content related measures is common, while the Ministry of National Development shows

indifference to these issues. Authorities show limited level of involvement and focus on individual core competencies and responsibilities.

Most frequent communication role: observer

Quote: 'The ministry is in charge of the Aarhus Convention, and it has to prepare a thorough report on its status, incorporating results of public consultation.' - Ministry of Rural Development, 13 June 2013

The prime interest of representatives of the 4th side is to ensure smooth and effective operations of the roundtable. Communication focus is on process management, interpretation and possible accommodation of needs of the members. A significant part of communication actions are international context driven.

Most frequent communication role: facilitator

Quote: 'This is the first roundtable initiative that aims at institutionalizing a new kind of dialogue' - AJBH, 4 May 2011

# Intensity of involvement and identification with nuclear agenda

Members of the working group turn to be the most active members of the roundtable. Most of the relevant - non-technical - interventions in the working group are from the following participants: AJBH, EMLA, Energiaklub, Ministry for Rural Development, MVM, Paks NPP, Paks 2 and REC. They are followed by interventions by the Hungarian Atomic Energy Authority and NAIH, while the Ministry of National Development and PURAM are the least active members of the working group. These levels of activities are also reflected in the roundtable addresses. The majority of the non-WG members of the roundtable only contribute to specific topics where they are specifically involved or addressed. Different members show varying levels of interest and involvement in the discussions, and express contrasting attitudes to the Paks development plans. Actual positions can be defined based on the number and content of interventions in the working group sessions and the roundtable discussions, reflected in the official transcripts of the meetings. Observation of contributions in meetings, together with the analysis of the texts of the transcripts provides both qualitative and quantitative data and consequently allows for a combined recording of individual behavior (see Annex 2).

The graph depicting the intensity level and the identification level of Aarhus roundtable members reflects diversity. Nevertheless certain patterns can be noted where the highest

number of critical interventions regarding the Paks expansion plans are expressed by a group of NGOs. This group can be labeled as that of the *active opponents*. Activity of licensees show high number of supportive interventions, these companies form the group of *active supporters*. Finally, a distinct group is formed by certain government authorities and NGOs that are supportive to the nuclear development agenda or even have a responsibility in pursuing this however they contribute very little to the work of the roundtable: these are called the *passive supporters*.

# Communication style

Words during the meetings and actual actions between meetings but outside of the framework of the Aarhus roundtable do not match. Two distinct spheres of relation exist, one that is Aarhus compatible, the other one that is actually followed during the actual operations between the individual organizations. The latter category includes delaying and even obstructing nuclear related communication processes, starting legal cases and omitting communication about important events and developments. Aarhus convention principles do not radiate to areas of everyday operation. The roundtable creates a structure where organizations compromise between reaching their actual agenda and the criteria of meeting transparency requirements. The communication style within the Aarhus roundtable does not become the standard in non-Aarhus related proceedings. This reflects the Aarhus roundtable becoming one of the possible tools of discourse that, in the end, does not have much contribution to the general nuclear discourse. Members consequently pursue achieving their objectives and communication needs beyond the frameworks of the roundtable.

## Findings related to content of work

The international context of the Aarhus process is lost. The Hungarian developments are not in any way connected to international Aarhus developments. Reports from individual members taking part in the international initiatives are received with indifference. National and international layers of issues exist apart. Except for the few members involved specifically with the international level aspects, only the national level issues are of relevance for the participants of the Aarhus roundtable. Interpretation of legal relevance of the Aarhus concept is debated throughout. Repeatedly, members do not agree granting additional rights to participants than what is anyway obligatory through legal terms. The concept of 'soft law' that would actually aim at easing the interpretations and adapting existing law does not

become standard. Instead, its interpretation creates a division line between members: some consider the legal framework as something that can and should be filled up to its limits, while other members consider legal framework as strong limitations that mark the no touch zones. Behavior of the members of the roundtable represents their organizational behavior patterns and their organizational attitude to the institution of the roundtable. Different types of organizations can be identified in terms of hierarchical setup, communication style, focus on process or on output, working for expectations or working for objectives. Their roles define their attitudes. Members are not ready to make steps beyond what their organization is mandated for.

## Conflicting views on key issues

Key issues seem stalemated due to conflicting views of members and the lack of actual dedication to find solutions. A selective list of examples includes:

Interpretation of role of clients in environmental proceedings

- •NGOs: anyone could be a client of nuclear procedures as they have effects on the whole population
- •licensees, government: the law limits with reason the definition of clients, and there is no reason to go beyond those limits

# Existence of channels of public participation

- •licensees, government: NGOs and the public use a fraction of the existing channels for obtaining information, consequently there is no need to extend channels
- •NGOs: the existing channels are limited, they often include hard to match deadlines and criteria for participation, therefore they are insufficient

#### Legality of Paks expansion plans

- •licensees, government: legal framework is ensured by Parliamentary resolutions and government decisions
- •NGOs, 4th side: existing legal framework is in many respects debatable regarding the expansion plans of the Paks NPP

Information access and confidentiality

•licensees, government: all necessary information is available for grounded decisions. Some

of the information are confidential and sensitive and, consequently, can not be shared with the

public.

•NGOs, 4th side: serious flaws prevail in the existence and availability of information. Public

control presupposes access to sensitive information and information can not be denied

referring to claimed business confidentiality.

Perception of key considerations regarding the Paks expansion plan

•licensees: technical, operational, managerial

•NGOs: social, economic, ecological

•government: energy political, economic

•4th side: legal, environmental information technological

3.3.4. Summary of findings

Along all criteria, fundamental differences describe members (Table 10). Together with the

'weak' coercive power of the Aarhus obligations, the potential for success is limited.

Members take part in the process with substantially different agendas and commitments. Each

member represents its own organizational interests and appreciates importance of Aarhus

roundtable accordingly. Due to the model setup and the commitment of members, the

roundtable serves as a forum of matching and conflicting argumentations. While certain

agreements are reached, the significance of these agreements is debated by some members.

Fundamental differences continue to exist. The forum allows for identification of differences.

even if satisfactory solution in many cases is not reached.

Analysis of the discourse shows that uneven access to information on nuclear issues results an

unbalanced communication situation. Equality of members cannot be granted due to

inequality in access to information. Monopoly of information contributes to the notion of

exclusivity of nuclear energy and of information. While the Aarhus roundtable sets a

framework for developing deliberation on nuclear energy in Hungary, however, due to its

limitations it rather becomes the representation of limitations to the public space.

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side	own agenda	core driver	perception of law	perception of roundtable	perceived responsibility in Paks NPP development	primary stakeholders served
licensees	ensure business rationality and satisfy business objectives	•nuclear professional expertise •business rationale •ownership of project	interpreted as the limits for transparency	a necessary element to meet obligations related to involvement of the public	operational, developmental, technical	•owners •shareholders •government
NGOs	have environmental transparency prevail	•ecological rationale •business rationale •transparency	interpreted as framework that needs to be fully filled	one of the tools to ensure transparency in environmental issues	representation of public interest in monitoring, control and influence on processes	•public •opponents •international organizations
government	represent national interests	legality and rationality	interpreted as its own domain of authority	a task to be fulfilled for meeting international obligations	execution of National Energy Strategy and creation of legal and financial framework for development	•(voting) public •international organizations •European Union
others	provide and facilitate forum	•process management •watchdog status	interpreted as a structure which may need changes	a possibility to match the mission of their individual institution with the success of the roundtable	representation of principles over possible practical shortcuts	•members of the roundtable •public •international organizations

Table 10: Overview of Aarhus roundtable stakeholders

#### 3.4. Media discourse on nuclear energy

In previous chapters it has been described that complex issues are prone to become subjects of parallel realities. Media has a significant role in the creation, maintaining and confirmation of constructed views. Due to possible differences in attitudes, expertise, dedication and possible political motivations of the various media, construction of differing narratives and parallel realities emerge. As a result, audiences face differing information, views and opinions of any given subject, without the actual possibility for matching these differing views. Parallel realities are compared to self-fulfilling prophecies, and media provides ammunition for further confirmation of claimed truth and accomplish reinforcement.

The probability of individual creation of reality grows parallel to physical distance, the lack of first-hand experience and the complexity of the issue. In this respect the social environment of nuclear energy production strongly encourages development of personal interpretations, as usually the physical distance to an existing nuclear power plant is significant, and one does not have the chance to easily visit such an installation. The majority of individuals has never had and will never have first hand, direct experience with nuclear-based electricity production. Finally, the issue of nuclear power production is vastly complex, including a range of aspects and characteristics that are difficult to overview and understand. Consequently a special phenomenon occurs: *double construction of reality*. Members of the public construct their realities based on constructed realities of the media. By meeting the personal filter system of knowledge, beliefs and values of each individual, the constructed reality of the media results in the creation of countless realities. Each interpretation is different and is a representation of personal attitudes; consequently the number of parallel realities is countless.

In relation to the effect of language in the construction of reality, it is important to underline that communication actors have an especially critical role. Through creation of the framework, and interpretation and construction of the reality they face the challenge of exceptional responsibility. Possible structures of relation and behavior are formed based on interpretation of actual events. Examples illustrate that the competence, attitude and responsibility of individual persons in the field of science and technology communication is critical. Not only do they need to have competencies in a technical field and in communication but they also need to maintain a balance regarding the quality and quantity of information they share with the public. Critical role of communication actors are

demonstrated in cases such as the 2010 Aquila earthquake in Italy, the 2011 Fukushima nuclear disaster in Japan, and health hazards and consequent actions related to the 2009 H1N1 global flu epidemic.

## 3.4.1. Methodology

In order to gain overview of media involvement in the nuclear agenda, media content analysis was conducted. The analysis interpreted texts from a qualitative perspective as well as explored the proportions and emphases of the texts through a quantitative approach. Quantitative approach allows for handling of the material as a mass collection of data (Baker et al, 2008). The combined approach has allowed for an analysis that has its in-width and indepth scope as well.

The media research evaluated the overall presence of the issue of nuclear energy in the media. The key word of analysis was that of 'nuclear energy' (*atomenergia*). Following the selection of the media, a coding system was set up, with the basic unit of coding being one article. Each article was coded according to a set of criteria: focus, general frame, tone, relevance, risks and benefits, keywords and identification of power relations. All articles have been evaluated that appeared in the given media and period and contained the indicated term. A well-trained coder helped inputting data, with their coding being controlled on a randomly selected basis. The coded data was then used to identify the communication patterns and strategies related to issue of nuclear energy.

For qualitative media analysis, and in order to assess actual representation and communication of independent actors, a different methodology has been chosen. To study the personal elements of individual discourse, the method of Critical Discourse Analysis (CDA) (van Dijk, 1989) has been followed. CDA places research of dominance in the focus, and seeks identification of elements of social injustice. CDA shares the belief that every social interaction has an inherent power dimension, and analysis of elements exploring power shed light on the actual social setting. Most often, representation of power dimensions appears in individual interviews or quotes given by individuals. These quotes usually provide an insight into the individual's reflection of the full situation, including the social, political and economic setting of the actual issue. Quotes serve as sources for the identification of signs of power, they reveal power relations and, consequently, indicate elements of political power or social injustice. Very often these quotes and interviews have a dual meaning, one that is

understandable at first sight, and another one that implies a hidden reference to other issues or other stakeholder groups. Furthermore, practitioners of CDA state that analyses cannot be done from a socially insensitive perspective, and that research needs to take sides. In their view, it is considered that CDA is a tool in the endeavor for a socially just structure, therefore CDA should assist those that suffer of social injustice. The qualitative media analysis of the current dissertation builds on the methodology of CDA, but firmly remains on the ground of objectivity. The current dissertation builds on the belief that the role of social sciences is to create a thorough representation of the world, where information is uncovered to facilitate grounded decision making. The current analysis consequently keeps distance of its subject, and is not motivated by the obligation to provide or judge value content of the elements of its subject.

# 3.4.2. Focus and findings of the media analysis

Content analysis of the online versions of the 4 leading daily political papers for 2 periods of 3 months each 12 was implemented. Splitting the 6 months into 2 distinct periods allowed for a better identification of trends, weighing of comparisons and avoidance of overrepresentation of individual events. Choosing online versions of the leading political dailies was driven by the hypothesis that due to editorial policies and practices selected mass media provides insight into how dominant political and professional narratives are represented in the public sphere. The priority of identification of dominant narratives overwrote other possibilities, including a wider choice of media or disfavor for classical mass media instead of social media.

Analysis of texts has been primarily done from a socio-linguistic dimension. With focus on the actual content analysis of text corpuses, certain other aspects gained less attention. Usually, in the case of online media coverage, the graphic format is also of importance as it indicates how the newspaper or online page text is organized. With the upgrade of importance of visibility and in the era of 'visual world', the focus on the actual content and composition of texts neglect certain other aspects. Nevertheless, as visuality - in contrast to textuality - is often a matter of choice characteristic to the media, and much less to the given topic, therefore inclusion of graphical and visual solutions for this analysis has not been considered.

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<sup>&</sup>lt;sup>12</sup> The research covered all mentions of nuclear energy in the online versions of the 4 leading daily political papers in Hungary, in the period October 1 - December 31, 2012 and the period October 1 - December 31, 2013. Online versions of the following papers have been included: Magyar Hírlap online (magyarhirlap.hu, "mh.hu"), Magyar Nemzet online (mno.hu), Népszava online (nepszava.hu, "nsz.hu") and Népszabadság online (nol.hu). Each of the media has a distinct political orientation, due to its ownership and editorial policy, briefly describable as: Magyar Hírlap (mh): right, conservative, Magyar Nemzet (mno): center right, conservative (close to government), Népszabadság (nol): center left, close to (main opposition) socialist party, Népszava (nsz): left

Characteristics such as typographical choices, drawings, cartoons, maps and further illustrations are fundamentally ignored. As for the actual position of the article on the page, which could be an indicator of its attributed importance, it is neglected on the basis of the media characteristic: online media are flexible in terms of page size and position as well as its changing, dynamic nature, and it does not allow for concluding objective and valid statements. The only exception where visuals are considered is the field of photos and their captions. In our assessment this gives an indication to what focus and importance is attributed to the article, and what the editorial attitude to the actual news content is.

Articles were coded according to relevance of articles. The coding of relevance levels followed that in the analysis of political discourse. Three categories were set up as follows:

relevance	content	categorization
1	information and news related to developments in international political relations	non-relevant
2	Hungarian or international information and news on fields in close relation with use of nuclear energy for electricity production	indirectly relevant
3	Hungarian or international information and news directly related to the development of the Paks nuclear power plant	directly relevant

# Distribution of articles

Distribution of articles according to media and relevance are shown below (Table 11).

relevance	relevance 2012				2012 total
	mno	mh	nsz	nol	
1	32	4	17	19	72
2	15	4	3	8	30
3	3	3	2	5	13
TOTAL	50	11	22	32	115
		20	13		2013 total
	mno	mh	nsz	nol	
1	20	9	6	34	69
2	16	10	5	6	37
3	17	3	2	9	31
TOTAL	53	22	13	49	137
			2013 vs 2012		
	mno	mh	nsz	nol	TOTAL
1	0.63	2.25	0.35	1.79	0.96
2	1.07	2.50	1.67	0.75	1.23
3	5.67	1.00	1.00	1.80	2.38
TOTAL	1.06	2.00	0.59	1.53	1.19

Table 11: Distribution of relevant articles in years 2012 and 2013 by media and level of relevance

In the first period, October 1 - December 31, 2012, 115 articles mentioned the term 'nuclear energy' (atomenergia). Mno.hu dealt with this subject in 50, nol.hu in 32, nepszava.hu, ("nsz.hu") in 22 and magyarhirlap.hu, ("mh.hu") in 11 articles. In the 3 months period a daily average of 1,25 articles mentioned this issue. A year later, in the second period, a total of 137 articles appeared, an increase of 19%. Of the four media, mno.hu published 53 and nol.hu published 49 articles, while nsz.hu produced 13 and mh.hu 22 articles. Daily average saw an increase to 1,49 articles/day. Nsz.hu shows disinterest in the issue while limited interest is reflected in the number of mh.hu articles. Actual presence of relevance 3 articles, dealing directly with the expansion of the Paks NPP, is only notable in nol.hu and mno.hu. Number of Paks development related articles almost doubled in nol.hu (from 5 to 9) and grew by more than 5 times (!), from 3 to 17 in mno.hu. In the latter case, being a media considered close to the actual government, a significant change in editorial policy on a strategic matter presumes agreement, or at least approval, from government.

#### Meta-topics in the media

Articles were analyzed according to the meta-topics covered. Each article was categorized into one of the meta-categories. In 2012 there were 9 such topics, while a year later this grew to 11.

Political and economic aspects related to nuclear power dominate the narratives, with 71% of all articles over the two periods. A point of differentiation is that most articles with political content have an international focus, while articles about economic aspects of nuclear energy are mainly with Hungarian content. Further meta-topics that have considerable presence are safety, energy policy and energy strategy. Interestingly, certain key aspects of a nuclear energy discourse are either underrepresented, such as technology (6 articles) or science (3 articles), or totally missing. Most notably, neither the environmental nor the possible moral aspects are discussed in these periods.

In terms of the comparison of the 2 periods certain significant shifts are to be recorded (Table 12). Most importantly the number of articles dealing with the economic aspects of nuclear energy increased over 6 times, from 7 to 44, and significant growth is detected in energy strategy, crime (primarily related to plutonium related theft cases in South Africa and Mexico)

and technology. A significant decrease in areas of safety, politics, energy policy and energy economy are also apparent.

meta-topic	2012	2013	total	change 2012 to 2013
politics	70	58	128	-12
economy	7	44	51	+37
safety	16	-	16	-16
energy policy	10	2	12	-10
energy strategy	4	8	12	+4
crime	1	8	9	+7
energy economy	5	2	7	-3
technology	-	6	6	+6
disaster management	-	4	4	+4
science	1	2	3	+1
economic policy	-	2	2	+2
sport	-	1	1	+1
art	1	-	1	-1
TOTAL	115	137	252	

Table 12: Distribution and change of relevant articles in 2012 and 2013 by meta-topic.

#### Focus of articles

It is worthwhile to check the geographical focus of articles (*see Annex 3*). In the period of 2012, of the 115 articles 38 refer to the Hungarian aspects of nuclear energy, further 12 mentions both international and Hungarian contexts, while 65 articles deal with international aspects only, reflecting an '*international dominance*', with a distribution of 38/12/65 articles. International focus implies that there while many events take place internationally related to nuclear energy, they are primarily in the field of political developments and therefore do not really concern Hungary. Most of the articles with Hungarian focus cover the 'everyday', operational, business as usual aspect of nuclear energy. Politicians and experts speak about successes, results and finished projects, issues do not appear as problems to be solved. 5 articles mention the planned expansion of the Paks plan, 2 of which analyze in detail that the decision whether to build further blocks is of significant importance to the future of Hungary.

In the period of 2013, significant changes can be noted. The distribution of the 137 articles, according to their contexts, split between Hungarian, mixed and international focus changes to 67/15/55, reflecting a sharp shift to issues with Hungarian relevance. The share of Hungary focused articles changes from 33% to 49%, and the center of media attention is on the actual development plans at the Paks site. The 'focus Hungary' change is in parallel to the previous description of the change in meta-topic, with the economic context becoming the dominant framing for Hungarian nuclear related issues. The number of articles dealing with actual Paks expansion plans, leaps from 5 to 20. General discussion on energy policy and safety issues is replaced by explicit expressions of will to execute the nuclear development strategy: 16 of the 67 Hungary related articles mention nuclear strategy and steps related to it. Another 'newcomer' on the list of topics for 2013 are the articles on international nuclear cooperation Hungary pursues with various countries. In these articles Hungary appears both as a receiver of nuclear technology as well as a country that is ready to share its experience and knowledge with others, for example with Vietnam on the operational aspects and with Japan on the safety aspects and disaster management.

# Absence of confrontational views and narratives

Analysis of narratives indicates that confronting views generally do not appear within one article. Especially in the first period, there is no discourse between the various actors. The articles do not aim at convincing and do not contain argumentation, but rather they interpret the decisions for expansion of the plant as the only possible alternative or describe the possible counterarguments to development plans. Analysis of the actual situation takes place in one article, while in another one a representative of an organization of renewable energies explains that the government support given to nuclear development goes against their interests. NGOs or other public actors are not present in the articles with the exception of 2 articles where a campaign of Greenpeace is mentioned. In 2012, in the articles, especially in the media that are close to the current government, the key words in relation to nuclear energy in Hungary are *safety* and *security*<sup>13</sup> as well as *independence*. The mention of safety usually refers to experience learned from the Fukushima disaster and the reassurance that concerns in Hungary are unfounded. The term of security usually appears in the context of energy supply

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<sup>&</sup>lt;sup>13</sup> In Hungarian safety and security are covered with one word: biztonság and the context decides which meaning is valid.

security, of which the Paks power plant is the most important collateral. In 2013 a few articles appear, especially in nol.hu, where confronting views are presented.

Emphasis of benefits in media close to the government match political discourse. The issue of nuclear energy is often represented as the guarantee of national independence. The energy situation of Hungary as well as the overall economic performance of the country relies on the ability to produce nuclear energy and this is closely related to independence. In two articles nuclear energy production appears as a significant element in the regional role of Hungary. A number of articles appear about various political protocol issues.

## Dominant and missing narratives

The absence of certain topics also reflects editorial intentions. Communication research considers non-communication as part of communication (Buda, 1988). From the perspective of organizational communication and media communication, non-communication is an example of non-agenda setting. In 2012, in spite of the focus on international aspects, no mentions were made in the articles about the consultative referendum in Lithuania about the establishment of a nuclear plant, and the decision in Bulgaria to host a referendum about the future of the existing nuclear plant. With the exception of sporadically mentioning Japan and Germany, it was not indicated at all that in a number of countries nuclear energy plans were under revision or have been put to halt.

## Semantics of titles

In a further area of research, the titles of articles have been analyzed and compared. Titles bear special significance. Their role is to attract readers' attention, encourage reading of articles and to condense content of the article. Not only does a title orientate the reader, but it creates a certain relationship between journalist and reader, media and audience.

Analysis of titles was done on relevance 3 articles, directly dealing with the development plans of the Paks NPP (Table 13). The 2012 period titles reflect *descriptive purposes*. Of the 13 articles that have appeared in 2012 in category relevance 3, all titles are short factual statements, such as "The Russian giant would work with Hungarian subcontractors" or

 $<sup>^{\</sup>rm 14}$  "Magyar beszállítókkal dolgozna az orosz óriás", mno.hu, 6 December 2012

"Visegrád countries in nuclear swing" <sup>15</sup>. All of them inform objectively and reflect keeping certain distance of recent developments or planned steps. There is only one article that breaks this rule and raises a question: "Nuclear for us?" <sup>16</sup>

		2012				
media	support development	criticize development	neutral			
mno	1	0	2			
mh	1	0	2			
nsz	0	0	2			
nol	0	1	4			
TOTAL	2	1	10			
	2013					
	support development	criticize development	neutral			
mno	10	1	6			
mh	1	0	2			
nsz	0	1	1			
nol	0	7	2			
TOTAL	11	9	11			

Table 13: Meaning of titles of articles

However, the 2013 period titles represent a significant change to the previous practice. The number of relevance 3 articles more than doubles (from 13 to 31). The informative role of titles diminishes, and headlines serve to provide clear orientation to the reader. The distance keeping tradition disappears and titles urge readers to take their side. Instead of reflection of content of article, the titles start to mirror editorial opinions and intentions. Instead of descriptive statements, the majority of titles imply a *normative reference* or a value judgment. A number of the titles openly build on the perceived risks or benefits of the Paks expansion. Study of titles indicates that contrasting opinions crystallize between mno.hu and nol.hu. Mno appears as a consistent supporter of the development plan, underlining the benefits of the project. Of the 17 title of mno, 10 clearly match moving from information to orientation, from a descriptive to a normative model. Titles include "A growing number recognize benefits of nuclear energy" 17, "Our country would benefit of nuclear energy" 18 and "Nuclear energy is popular",19 openly take a standpoint on the issue. Further six titles are neutral in their statements and there is one article voicing dissonance: "Varró: New Paks is not a gift".<sup>20</sup>.

<sup>&</sup>lt;sup>15</sup> "Nukleáris lendületben a visegrádiak", nol.hu, 12 October 2012

<sup>16 &</sup>quot;Atomot nekünk?", nol.hu, 4 November, 2012

<sup>&</sup>lt;sup>17</sup> Egyre többen felismerik az atomenergia előnyeit, mno.hu, 31 October, 2013

<sup>&</sup>lt;sup>18</sup> Jól járna hazánk a paksi bővítéssel, mno.hu, 12 November, 2013

<sup>&</sup>lt;sup>19</sup> Népszerű az atomenergia, mno.hu, 11 November, 2013

<sup>&</sup>lt;sup>20</sup> Varró: Nem ajándék az új Paks, mno.hu, 12 December, 2013

Similarly, the editorial content of nol, reflected in choice of titles, give proof of committed journalism. Of the 9 articles in the 2013 period, 7 bear a title that reflect the editors' open criticism of the project, and highlight risks rather than benefits. "Paks electricity will be expensive" "Nuclear power is of the past" "Prearranged deal behind Paks expansion" and "Low cost electricity from most expensive source?" "24"

Titles emphasizing risks and benefits crystallize a new function of media, which is to mobilize supporters and help them voice their concerns. This practice reflects the observation that manufactured communication often builds on existing fears, perceptions, observations or findings of surveys (Habermas, 1962). Consequently, media functions as voice of supporters or of opponents of the project.

In summary, there is a distinct difference between the two periods. In 2012, titles reflected a mainly neutral standpoint where the self-representation of media is that of conveying information. It envisions itself as a technical tool, a medium that serves the public by sharing information. In 2013 a drastic change can be observed. Titles reflect an orienting function where they clearly implicate the audience what standpoint to take. The titles openly build on key claimed values and emphasize benefits or the risks of the expansion plan. Presumably, media taking sides is a reflection of growing political and economic pressures.

#### Descriptive vs. normative approach

A further consideration for analysis is offered by the identification of value content of the full articles, not only their titles. An attempt has been made during the analysis of the discourse to make a distinction between *fact based descriptive* and *value laden normative articles*. Descriptive articles can be characterized as factual and having a descriptive content. The statements of the articles are based on verifiable factors and analyze the subject of the article as something that is true or false. Normative articles include a reference or a clear expression about how the ideal situation would or rather should like. Usually they contain a comparison between the actual, factual situation and a certain standard. The standard is often expressed by someone with authority building on expertise or position. The normative approach matches facts with ideals, often contains prescriptive elements, and looks at the subject of the article

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<sup>&</sup>lt;sup>21</sup> Drága lesz a paksi áram, nol.hu, 31 October, 2013

<sup>&</sup>lt;sup>22</sup> Az atomenergia a múlt, nol.hu, 4 November, 2013

<sup>&</sup>lt;sup>23</sup> "Lezsírozott" paksi bővítés, nol.hu, 20 December, 2013

<sup>&</sup>lt;sup>24</sup> Olcsó áram a legdrágább forrásból? nol.hu, 19 October, 2013

from the perspective of justifiability, not verifiability. On a theoretical basis, the normative articles bear a value judgment, and therefore carry a comparison towards an imaginary criteria, while descriptive articles give coverage of a certain event or process. The two approaches mark a distinct difference in that descriptive articles serve as source of information while normative articles tend to provide orientation. Articles of both periods were studied in order to identify their character of being value laden or fact driven. However, due to a significant number or articles showing both descriptive and normative characters, this analysis did not lead to conclusive findings.

## 3.4.3. Assessment of risks and benefits: systemic versus linear thinking

In 2012, of the topical subjects in international media, none of the Hungarian articles cover the context of the issue of financing nuclear constructions, the risks of delayed projects and the issue of interrelation between politics, nuclear industry and supervisory authorities, all of which are frequently discussed internationally. All this contributes to the creation of a reality where the decision making process, the construction and the operation of the extended nuclear plant follow a simple, linear model and is not challenged by risks noted internationally.

A key element in discourse about nuclear energy is weighing the risks and benefits of use of nuclear energy for electricity generation. Summary of the two periods show that of all risks, financial considerations, including high costs, impossibility of financing and the risks of fixed price system are most apparent. The group of risks regarding democracy, including lack of information on the project, concerns about illegitimate decision-making and deadlines straining legality, follows this. Risks about compatibility with democracy appear in opposition media only. Risk factors related to safety considerations are also significantly present, while political risks of growing political dependency and environmental risks are mentioned only sporadically.

As for benefits, relevant articles underline the cost efficiency of electricity generation through nuclear power, turning it into the single most dominant benefit factor. In the listing of benefits, the safety aspects of nuclear energy follow, while the reduction in greenhouse gas emissions underlines the environmental benefits. In a few further cases, security of energy supply and the economic aspects of reduced need for imports together with the creation of employment are mentioned.

	risks		benefits	benefits		
finance	high cost of investment, financing difficulties	16	low cost of operations	27		
compatibility with democracy	lack of information, illegal decisions, deadlines	10	-	-		
safety	Fukushima prove that nuclear energy is not safe	8	especially after Fukushima it is highly safe	16		
independence	strong political dependency	4	reduction of energy dependence	4		
environment	nuclear waste, radiation risks	3	total decarbonization	11		
energy supply	-	-	supply security	5		
effect on the economy	-	-	creation of employment	1		
		41		64		

Table 14: Mapping of risks and benefits based on the relevant articles

Matching argumentation of risks and benefits implies interesting conclusions. It is clear (Table 14) that several aspects of nuclear energy bear risk as well as benefit factors. Both sets of arguments claim cost factors are on their side. A more detailed analysis sheds light on different interpretations of the costs aspect. Critics of nuclear energy highlight the uncertainties related to the costs of investments of a new NPP, the consequent financing difficulties and the material repercussions of increased, post-Fukushima safety measures. Protagonists of nuclear energy underline low operational costs of existing NPPs as a key benefit. The difference reflects different approaches: the critical viewpoint is expressed rather of a broader platform with looking at the more complete NPP life cycle, while the supportive approach focuses on the actual operational aspects of an existing NPP.

The issue of safety is also addressed both as a risk and a benefit factor. In both argumentations, Fukushima plays a critical role: in critics it is a proof of the ongoing risk factors linked immanently to nuclear energy, while for supporters post-Fukushima safety measures are key arguments in discourse on benefits. The topic of independence is also perceived differently: the core of the difference between risk and benefit communication is if political independence is also included or the focus in on energy independence. In general its is also disputed if energy independence and political independence are interrelated or not.

Argumentation of benefits, such as low cost of operations, decarbonization of the environment, secure supply of energy, economic benefits all reflect *linear thinking*. In this approach the focus is on the existing, operational nuclear power plant. It is claimed that the benefits of these operations clearly outweigh the potential risks. Linear thinking does not

dedicate considerations to *actual and virtual costs* of creation of an operational nuclear power plant, appreciation of social costs are non-existent. Benefits are weighed without actually looking at the price-tag: what the country, the society or the environment needs to cover in terms of opportunity cost, what it needs to put in or give up in order to have an operational nuclear power plant.

Argumentation about risks reflects a more complex approach. Here the argumentation is not linear, but reflects interdependency of issues. The aspects of financial costs, risks of lacking proper information, concerns about political dependency, handling of nuclear waste, the issue of timing, and deadlines as well as concerns of illegitimate decision making all reflect an interdisciplinary, *systemic thinking*. Opponents claim that it is not enough to look at an actually operational NPP, but the whole process needs to be considered to weigh all risk factors, starting with the planning, building and operation of the plant to the handling of the uranium and of nuclear waste. Critics of opponents claim that most of the risk factors are raised by people who are not competent in the field of nuclear energy, and their observations are to a large extent irrelevant. The strong differences between linear thinking and system based thinking result inability to enter into discourse, and this gives explanation to why parallel realities exist in this field as well.

Differences in risk - benefit perceptions indicate contrasting structures of thinking.

Differences can be best described by matching the elements of linear and systemic thinking:

aspects	linear thinking	systemic thinking	
framing	technology environmen		
function	operation	creation	
perception of systems	closed	open	
key value	stability	flexibility	
model role	regulatory	adaptive	
sensitivity to:	benefits	risks	

Table 15: Indicative differences between structures of thinking

#### 3.4.4. Analysis of interviews

In a further piece of research a semantic comparison was made of two leading opinion interviews about the expansion of the Paks nuclear plant<sup>25</sup>. Mr. Pál Kovács, Energy Secretary of the Hungarian government and Mr. András Perger, senior energy advisor of NGO Energiaklub were interviewed after each other by the leading Hungarian news site, Origo<sup>26</sup>.

Criticism might be raised that two individual media interviews do not provide proper ground for socio-linguistic comparisons, challenging if interviews interpreted and published by a medium can be considered as unbiased representations of the thoughts and words of the interviewees at all. Arguably, there is a chance that the intentions of the media itself are also represented in the interview, through the questions, the reactions and the style of the journalist as well as the actual editing of text. Respecting the distinct difference between sociological and media interviews, the validity of the current comparison is granted by the practice of interviewees in Hungary to check interview texts before appearing in print. Both persons have had a considerable experience in expressing their thoughts and in articulating their argumentations. Bearing in mind furthermore that the two interviews have been prepared within a short interval and by the same journalist, the interviews can be considered as comparable representations of the interviewees' thoughts and words. Of course, having controlled texts at hand and the filter of editorial contribution, certain layers of sociological and psychological contexts may have been lost. Bearing in mind that both persons had the chance to review the article before going to 'print', the articles are suitable to identify certain framing structures and patterns of thinking and communication. Though media interviews may partially reflect editorial intentions and therefore cannot be considered as full right sociological interviews (Solt, 1978, 1998), they are still appropriate for semantic analysis.

#### Semantic analysis of text corpuses

In the first step, the analysis focused on the identification of key words and categories. Use of keywords represents a conscious effort on behalf on an interviewee to emphasize or de-

<sup>&</sup>lt;sup>25</sup> The semantic analysis is based on the author's conference presentation: *Safety Narrative of Nuclear Energy* at the Conference of the Culture of Safety and Defence, Gödöllő, 14 June, 2013 and the publication of the text *The Issue of Safety and Security in the Discourse about Nuclear Energy in Hungary* in the consequent conference e-book, available at: <a href="http://psharg.com/Preview/gabor-sarlos.html">http://psharg.com/Preview/gabor-sarlos.html</a>

<sup>&</sup>lt;sup>26</sup> Mr Pál Kovács: 20 November, 2011: <a href="http://www.origo.hu/idojaras/20111220-nem-engedheti-meg-maganak-az-atomstopot-magyarorszag-interju-a.html">http://www.origo.hu/idojaras/20111220-nem-engedheti-meg-maganak-az-atomstopot-magyarorszag-interju-a.html</a>, Hungary can not afford a stop to nuclear energy" and Mr. András Perger: 5 December 2011: <a href="http://www.origo.hu/idojaras/20111205-olyan-lesz-paks-ii-mint-a-negyes-metro-interju.html">http://www.origo.hu/idojaras/20111205-olyan-lesz-paks-ii-mint-a-negyes-metro-interju.html</a>, Paks 2 will be like underground line 4"

emphasize certain aspects, while categories provide an indication of the framing effort of the given person. Consequently, identification of patterns of thoughts and indications to areas of focus can be pinpointed. Content analysis based on search and analysis of key words and assigning categories to groups of key words allow for identification of patterns and structures of texts and thoughts. However, this method does not allow for context analysis, and has limited validity for identification of emotional content of interviews. Nevertheless content analysis is suitable for identification of focus areas, exploration of internal balance structures and identification of patterns of argumentation.

Through the content analysis, 16 categories (Table 16, 17) and 55 key words have been recognized. Of the 7 most important categories, the first 2 categories - data and energy - are identical in the 2 interviews. Differences appear in the next categories where in the case of Mr. Kovács the expressions related to future (including frequent use of words like *future*, *development* and *will be*) as well as values (with words such as *stability*, *security*, *responsibility* and *clean energy*) are also among the most frequently used terms. In the case of Mr. Perger, the terms within the framework of finances (including frequent reference to *costs*, *billion*, *forint*, *dollar* and *risk*) and *Paks* are also among the most frequently used terms.

Mr. Pál Kovács		Mr. András Perger		
data	51	data	76	
energy	37	energy	52	
economy	25	economy	41	
nuclear energy	16	nuclear energy	38	
electricity production	14	finances	32	
future	13	electricity production	25	
values	13	Paks	13	

Table 16: Top categories in the two interviews

In order to determine how significant the actual difference is in use of key words a comparison of number of mentions was made. To this end, coverage of each category was compared in numeric terms, and a ratio of occurrence of key words related to the various categories in the 2 interviews was calculated.

	Perger / Kovács	Kovács / Perger	ratio
finances	32 / 4		8
nuclear energy	41 / 16		2.56
accident	10 / 4		2.5
electricity production	25 / 14		1.79
official procedure	7 / 0		Х
environment		0 / 6	Х
values		3 / 13	4.33
traditional energy sources		3 / 6	2
future		10 / 13	1.3

Table 17: Comparison of occurrence of categories of key words (top 9 of 16 categories)

Higher values indicate differences with higher significance. Categories that are more in the focus form a better basis of comparison than those where a relatively low number of mentions are made. The most significant differences are noted in 9 categories out of 16. In the interview of Mr. Perger primarily the issue of *finances* gain strong dominance against the other interview, while *nuclear energy, accident, electricity production* and *official procedure* also show a significantly higher presence than in the other interview. As for the narrative of Mr. Kovács, key words in the categories of *environment* and *values* outnumber significantly similar usage from Mr. Perger, while reference to *traditional energy sources* and to *future* also outnumber comparative use of similar expressions.

An in-depth analysis compared use of key words. The objective has been to identify what the key words for the two interviews were and what difference existed in the frequency of use of these words. Comparison has shown that the 6 most frequently used words are identical in the 2 interviews: 0, power plant, nuclear, electricity, reactor, 1, Paks, will be and market. For Mr. Kovács, capacity and consumer have been the next most frequently used words, while for Mr. Perger these are need and cost. Consequently, the most frequently used 11-11 words do not indicate significant differences, and show that the overall language reconstruction of reality in the 2 interviews is similar. A notable difference can be remarked by looking at key words, that have been used significantly more often by one or the other person, and the analysis of the category where these words belong. Comparison of categories of words showed that

among the words Mr. Perger used most often compared to Mr. Kovács, 3 belong to *economy*, 2 to *nuclear energy* and 1 each to *accident* and *finances*. Mr Kovács used relatively more frequently the framing of *values* (2 words) and 1 word each from the categories of traditional sources of *energy*, *international aspects*, *environment* and the *future*.

In consequence it may be noted that the general construction of reality is similar for the 2 interviews. Differences can be noted in terms of argumentation, where Mr. Kovács builds on a general framing with principles, plans and values in the focus. With each of these aspects the benefits are emphasized. This argumentation can be characterized as *macro-framing* where the emphasis is on the overall direction, and for sharing and looking for understanding and support in terms of values, beliefs, attitudes. The general approach of Mr. Perger indicates a concrete, factual and often number-oriented framing. The argumentation goes for the clarification of details, where the balance regarding the development plans speaks clearly against development, and where risks are more visible than the benefits. His argumentation can be described as a *micro-framing* where the focus is on the controversies of the actual development plan.

## Analysis of emotional content

A further attempt focused on widening the analysis by including the study of occurrence of morphemes (Table 18). The dissertation focuses on identification of morphemes that would add meaning beyond that actual text, and give indication about the relationship between the person and the topic. The analysis focused on 4 distinct elements: punctuations, prepositions of time, negatives and the possessive case.

category	morphemes	occurrence András Perger	occurrence Pál Kovács	ratio
punctuation	?	8	4	2
	α α	3	0	X
preposition of time	already	25	6	4.16
	yet	13	4	3.25
negatives	no, not	41	9	4.55
	nor, neither	12	3	4
possessive case	our'	21	32	1.52

Table 18: Selected morphemes identified in the interviews

Differences in use of morphemes may lead to important conclusions. With the exception of the possessive case, usage of all other morphemes is significantly more frequent with Mr. Perger. Punctuations, prepositions of time and negatives used by Mr. Perger may indicate uncertainty, reference to doubts or reflections of emotional influence, all in relation to the topic of nuclear development plans. All this adds further dimensions to the interview, and encourages the reader to continue contemplating on the issue. The complexity of identification with the issue is closely related to the complex nature of the actual issue. Mr. Kovács has a significantly higher ratio of use of possessive case in the interview. This may be an indication of strong identification with the subject of the interview: the actual development plans. However, full assessment of differences in attitudes requires consideration of the different positions of the two persons. Expectations towards a government representative leave a limited space to voice personal opinion, while the expert of a NGO may have a wider choice of tools at hand. Nevertheless differences are apparent and need to be considered when the effectiveness of the interviews is considered.

# Conclusions on differences

In conclusion it may be noted that in the narrative of András Perger on the use of nuclear energy and expansion of Paks NPP is *an issue for rational discourse*, where facts form the basis for forming opinions and making decisions. These aspects are primarily dominant in the fields related to economics, the financial aspects as well as the safety and security angles of the planned project. In his narrative, use of nuclear energy is not a symbol of sublime ideals, but a matter of weighing choices among alternatives for future energy use. All this is differentiated further through the analysis of morphemes that disclose the thoughts of a person raising doubts about the project and the participation of the state within that.

The narrative of Pál Kovács ephasizes that the project in fact means one of the most important tasks of the present and the future. Based on values and the future prospects, the use of nuclear power and the expansion of the Paks NPP is a task meriting the highest level of responsibility. Such tasks can only be executed if acceptance of the highest principles is respected. In this complex situation, use of nuclear energy is not simply the most important element of electricity production, but *is a symbol of a modern, stable and safe country*. Nuclear power in itself is a symbol of the creative energies and productive capacities of the

country. Analysis of morphemes reinforce that the issue is in the hands of person who is personally convinced and committed to this cause.

#### 3.4.5. Nuclear discourse in the social media

Analysis of the media discourse cannot be complete without the inclusion of social media. Technological changes, as described in the literature review, sparked restructuration of previous communication processes, dominated by mass media and interpersonal communication. The emergence of "mass self-communication" grants equal chance for access to communication channels to all actors. Differences in power, influence, availability of resources, domination and background become counterbalanced through the possibility to become active communicators. The previous barriers of the agenda-setting practice of the editors or the lack of access to mass media become surmountable through direct reach to the individuals

Brief overview of the digital communication scene and the social media<sup>27</sup> signal that individual websites, blogs and social media do cover various aspects of the nuclear issue, however, due to lack of interactivity, limited scope for actual involvement is offered.

#### Overview of Google rankings

Google ranking records the status of how various websites appear in the Google search engine. This approach has been widely accepted as an indication of the relative importance of digital references. Actual results are the result of a range of factors, including frequency of how the relevant websites have been previously accessed, as well as the result of search engine optimization activities of the actual organization. Regardless of the factors, Google ranking shows the actual order how websites appear in relation to a specific subject. As user statistics prove that internet surfers tend to find information on the first few pages, therefore the order of the rankings is critical for accessibility to the users. The search focused on rankings in relation to the term "nuclear energy" (atomenergia) and involved recording of the findings in two distinct moments: 23 October, 2013 and 29 January, 2014. The rankings show what the most important points for sources of information on nuclear energy were in those 2 moments. To identify actual mass self-communication actors, the news sites and the resources of the traditional mass media companies were excluded from the rankings.

<sup>&</sup>lt;sup>27</sup> Detailed analysis of the social media landscape on nuclear energy extends the frames of the current dissertation.

	category*	address	comment	rank 23 Oct 2013	rank 29 Jan 2014
wikipedia	other	http://hu.wikipedia.org/wik i/Atomenergia		1	1
Országos Atomenergia Hivatal	government	http://www.haea.gov.hu/w eb/v3/OAHPortal.nsf/web? OpenAgent	government agency, sub page of government site	2	3
Atomenergiainfo	licensee, international	atomenergiainfo.hu	official site of Rosatom in Hungary	3	2
KFKI	other	http://www.aeki.kfki.hu/	Atomic Energy Research Institute of the Hungarian Academy of Sciences	4	9
Euratom	licensee, international	http://europa.eu/legislation _summaries/energy/nuclea r_energy/index_hu.htm	EU agency	5	6
BME Nukleáris Technikai Intézet	other	http://www.reak.bme.hu/	Nuclear Technology Institute of the Budapest Technical University	6	7
Klímabarát Települések Szövetsége	NGO	http://klimabarat.hu/node/2 48	Association of Friends of Climate	7	4
Energiakaland	licensee, international	http://www.energiakaland. hu/energiavaros/energiafor rasok/atomenergia	EOn educational site for students and teachers	8	- (34)
International Atomic Energy Agency	licensee, international	http://www.iaea.org/	only in English	9	8
atomenergia.lap.h u	other		site collection for all information related to nuclear energy	10	-
NEFMI	government	http://www.kormany.hu/hu/nemzeti-fejlesztesi-miniszterium/klima-es-energiaugyi-allamtitkarsag/felelossegi-teruletek/atomenergia	site of Ministry of National Resources, in charge of development of nuclear energy in Hungary	-	5
Fenntartható Atomenergia Technológia Platform	other	http://faetp.kfki.hu/	new association, Platform for Sustainable Nuclear Energy, close to the technical university	-	10
Virtuális Ökomúzeum	other	http://www.zoldmuzeum.h u/atomenergia-pro-es- kontra	listing argumentation for and against the use of nuclear energy	27	40
Alternatív Energia	other	http://www.alternativenerg ia.hu/	overview of all alternative energy sources with mentioning of nuclear energy	33	-
Greenpeace	NGO	http://archiv.greenpeace.hu/kampany/energia_es_klima/atomenergia	global NGO, highly critical	36	49
Paksi atomerőmű	licensee	http://www.atomeromu.hu/ atomenergia-jelen-es-jovo	Paks NPP	42	-

Table 19: Google ranking of sites dealing with nuclear energy

<sup>\*</sup> Categories match grouping of Aarhus members: government, licensee, NGO and other.

In the top 10 ranking in October (Table 19), 1 site represented the *government*, 4 belonged to the category of *licensees* (but none of them were the actual Hungarian licensees), 1 NGO was ranked and 4 were representing *other* institutions. Beside the site collection, the further 3 "others" were all sites related to the sphere of nuclear research and education. The absence of the actual stakeholders is apparent on the list. The government, directly in charge of nuclear development is not present, none of the NGOs present and active in the Aarhus roundtable are visible and the actual Hungarian licensees are not represented either. Without a more structured analysis it can still be stated that the active presence on the internet, in the form of an informational website, is not among the listed tools of communication for the actors of the nuclear issue.

The January "snapshot" slightly modifies the picture, with the Ministry in charge of nuclear development becoming an active player and with the appearance of another pro-nuclear association, linked to the Technical University, appearing on the list of top 10 sites. As a point of interest, the site of Greenpeace, the prime green NGO opposing nuclear development, ranks 36 and the actual licensee of the Hungarian nuclear development, the Paks nuclear power plant ranks 42 on the October 2013 listings. A number of hypotheses would need to be tested to understand the reason of the rankings. Neglect from both the owners and the visitors of websites, which could be primarily in charge of disseminating information on the nuclear development agenda, is obvious. Owners of sites could raise ranking through search engine optimization, while visitors could give a lift to sites through frequent visits and use as prime source of information on nuclear matters. Presumably, actors use other channels of communication to obtain information and to reach their publics.

## Overview of You Tube activities

You Tube activity provide on indication on the intensity of visual mass self-communication. Films generated by individual users and shared over You Tube provide information with the public. Number of viewers, likes and shares provide an indication on the "popularity" of an actual upload. Originally starting as an entertainment channel, its role is continuously growing in the field of education, organizational communication, sharing of scientific and technological information. The channel becomes a model for the merger of sharing information and entertainment, infotainment.

title	description	author	date	statistics on views
A nukleáris energia nem megoldás - m1 / Nuclear energy is no solution	Roundtable on MTV1, leading Hungarian public broadcast channel	Greenpeace	28 Mar 2010	1088 views Jump in viewership: following March 2011 (Fukushima disaster), July 2012 and January 2014 (Paks deal)
Áramlat / Stream	Public competition organized for promotion of nuclear energy	Atomenergia info	31 Oct 2013	1005 statistics not available
Láncreakció - Varró László - Az atomenergia és a megújuló energiaforrások / Chain reaction - Nuclear energy and the renewables, László Varró	Conference organized on risks and use of nuclear energy	Ökopolisz Foundation	23 Dec 2011	Jumps: January, March, October 2012 June 2013
Messiásaz én 40%-om - Atomenergiainfo / Messiah - my 40%	Public competition organized for promotion of nuclear energy	Atomenergia info	31 Oct 2013	461 statistics not available
Atomenergia az én 40%-om! Atomenergiainfo / Nuclear energy is my 40%	Public competition organized for promotion of nuclear energy	Atomenergia info	31 Oct 2013	Jump at beginning but no visitor since December 2013
Szél Bernadett a paksi erőmű bővítéséről, az atomenergia problematikájáról / MP Bernadett Szél about the extension of Paks NPP	interview about risks of nuclear energy	Ökopolisz Foundation	29 Aug 2011	370 jump: February, June 2012 October 2013
Láncreakció - Jávor Benedek - Az atomenergia és a megújuló energiaforrások / Chain reaction- Nuclear energy and the renewables, MP Benedek Jávor	Summary of lecture at Conference organized on risks and use of nuclear energy	Ökopolisz Foundation	23 Dec 2011	Jumps: April, October 2012 June 2013
Vége az olcsó atomenergia korszakának! / End of low cost nuclear era	Summary of the whole conference on the energy systems of the future	Ökopolisz Foundation	28 Oct 2012	358 no significant jump
Aszódi Attila: Atomenergia - objektív kockázat, szubjektív félelem Nuclear energy - objective risks, subjective fears	Interview with head of nuclear research lab of the Technical University	TudásPressz / Science Cafe	15 Feb 2013	346 Jumps: December 2013 January 2014
Az atomenergia és a civil szervezetek / Nuclear energy and the civil society	Summary of a roundtable at the Syposium of the Hungarian Nuclear Society	Laszlo Palos	1 Dec 2011	286 no significant jump

Table 20: Top 10 You Tube films on key word "atomenergia" (nuclear energy)

The search focused on You Tube rankings in relation to the term "nuclear energy" (atomenergia) and involved recording of the findings the 29 January, 2014. The rankings show what the most frequently visited films were nuclear energy were at that moment. To identify actual mass self-communication actors, the news sites and the resources of the traditional mass media companies were excluded from the ranking. The 29 January 2014 the top 10 films on You Tube, researched through the key word "nuclear energy", included four films of Ökopolisz, the green foundation close to the LMP, dominate the list, followed by three films of Atomenergiainfo, the Hungarian language site of Rosatom (Table 20). The 4 films are recorded speeches at various conferences and events, while the latter 3 are promotional films for a nuclear awareness competition. The promotion of nuclear energy is further supported with one film each by the Hungarian Nuclear Society and the Technology University, while the critical views are expressed by the film of Greenpeace, attracting actually the highest number of viewers. The listing shows that the government and the Hungarian licensees did not produce any film to land on the list of top hits. The uneven presence on You Tube shows that certain actors consider this channel as a significant entry point to the public sphere, while for others it remains an unexplored area.

In overall terms, it can be noted that based on the analysis of two selected digital channels, mass self-communication, the use of digital information sharing technologies from the sides of the government and the companies in charge of Paks expansion, is neglected. NGOs do not seem to be using these tools systematically. The most significant presence can be noted from educational and scientific organizations as well as international licensees. A detailed content analysis could provide indication about to what extent are those information influenced by perceived interest of the actors to gain a role in the future development of nuclear energy in Hungary. Digital communication is underutilized in the nuclear discourse which may indicate a lack of genuine discourse on this issue.

## 3.4.6. Summary of findings

In summary it can be noted that due to the complex nature of the issue, the public relies on the media to create an understanding about the nuclear issue. Media subsequently plays a critical role in the construction of reality of nuclear energy and the Paks expansion. Media analysis indicates that in longitudinal comparison, media is becoming increasingly alert about nuclear issues. While earlier the media was dominated by internationally related and politically

dominated news, by the end of 2013 focus turns towards Hungarian relevance and economic aspects of nuclear development. Risk and benefit perception often refers to the same characteristics of nuclear energy, differences can be rather attributed to variation in approaches. Most of the media continues to address the nuclear agenda from a linear approach, however a growing number of articles reflect an aspiration for systemic thinking. An increasing number of articles accommodate contradictory views, and titles of articles tend to reflect strong orienting and normative purposes. Differences in approaches of the various actors can be noted in individual interviews as well as in the attitude and familiarity of use of social media. Narratives appearing in the media show strong elements of similarity with trends in political and professional narratives.

# CHAPTER IV: THE ROLE OF OPINION POLLS IN INFLUENCING THE NUCLEAR DISCOURSE

Analysis of the political, professional and media discourse lead to the conclusion that these layers have limited ability to represent the nuclear discourse, therefore are able to convey only fragmented elements of the reality. Access to political discourse is difficult due to the reconstruction of its language and its secluded nature, the layer of professional discourse is limited to the frameworks of a dedicated series of meetings and discussions, while the media discourse seems to reflect a manufactured construction of the reality. This leads the search to identify further layers of discourse where the narratives related to the nuclear discourse can be revealed. In order to identify what further areas can be of interest, notable are the fields that serve as reference areas for the discussions in the previous three layers. In order to gain credibility, political and professional actors as well as media articles often refer to two further areas: opinion polls and international nuclear discourses. This strategy falls in line with a common communication practice of accrediting value and credibility through 'credibility transfer', where the credibility of external parties are used to reinforce value of own statements.

Findings of opinion polls on nuclear energy may provide clear identification of narratives. Devising manufactured publicity is based on an in-depth knowledge of the public that one wants to reach. Ownership of factual information is simply scratching the surface. Instead, surveys focus on exploration of fears, beliefs, values, associations and attitudes related to a given topic. The more the issue focuses on the individual, the more it focuses on exploring the deeply hidden aspects. The use of the results of surveys is characterized by how the findings of facts are used in the course of actual deliberation, and become elements of discourse themselves. It can be argued that research tools may become items of manipulation on their own right. For the direct assessment of the views of the public the opinion polls need to be analyzed in detail.

## 4.1. Challenges of public opinion polls

Public opinion polls have a critical role in gaining insight into public thinking. Polls provide surveys of the public opinion through soliciting answers from a particular sample. The

primary role of surveys is to provide feedback and assist decision making of the owner. However, findings of polls can serve as potential tools for actual communication purposes. In these cases, research findings serve as points of information that provide argumentation to a specific subject. The model for argumentation is through referring to the findings of the polls, claiming that the public support or opposition to a planned action has been expressed through the poll. Attributing authority to and claiming the backing of the public endorses the argumentation of the owner of the poll.

Opinion polls are prone to become tools in manufacturing the public. In a large number of cases, vested interest is connected to arrival of polls at specific findings. Once results of the poll match the envisaged outcome, it can serve as justification and support a specific decision. In relation to a strategic issue with contradictory narratives, temptation or even pressure may arise to serve a specific purpose, and to support an actual message by arriving at preconceived results. Subsequently polls can provide argumentative support or opposition to the planned expansion of the Paks plant.

Seeking specific results is not done through manipulation of findings. Manufacturing results is rather attributed to various methodological issues (Babbie, 2007), such as containing statements that may be interpreted in more than one way and include more than one complete thought (Edwards, 1994), specific way of constructing questions and selecting specific answers for publication (Mariotte, 2012), the actual context and the wording of questions (Antal, 2013), impact of repeated surveys and the use of questions that directly appeal to emotions like insecurity (Lever, 2013).

Validity and objectivity of a poll comprises two different sets of criteria. In terms of validity, it is enough to meet the professional standards of the industry, for objectivity the purpose of the research and the owner of the research should not in any way influence the design of the poll neither the interpretation and publication of its outcome. If these criteria fail, not only opinion polls but their interpretations also become part of the game of constructing reality. Comparison of outcome of different pieces of research requires attentive consideration. Comparability is especially difficult in the case of polls on complex issues, where interpretation of the issue reflects perceptional differences, deriving of variations of knowledge, awareness and attitude. Findings of polls on highly complex issues, on which very few people have first hand experience, often reflect significant differences or even divisions. Issues related to technologies affecting human lives, such as genetic modification

(Poortinga, Pidgeon, 2003) and climate change (Semanza et al, 2008) are especially prone to divide. Attitudinal restraints, including distinct split on specific issues, is influenced by skepticism, distrust, fatalism and lack of knowledge (Lorenzoni et al, 2007). Complexity of the issue of nuclear energy may be reflected in the diverging approaches opinion polls represent. Even with focus on the same issue, the use of nuclear energy, research polls still may differ considerably.

# 4.2. Public opinion polls on nuclear energy in Hungary

In the period 2009-2013, a number of public opinion polls have been conducted comprising this subject. In order to gain a general overview of the public perception of nuclear energy in Hungary and of the planned expansion of the Paks nuclear power plant, 6 public opinion polls have been examined and compared (Table 21). Various opinion polls arrive at contrasting results. An analysis and comparison of methodologies is conducted to understand the differences in results. Comparison of a pool of polls may help come to a conclusion that reflects aggregate results.

Analysis of these polls helps better understanding of the subject as well as studying the role of public opinion polls in exploring and shaping attitudes, beliefs and knowledge. To balance inconsistencies and allow better comparability, 6 polls were selected: 3 polls from TNS (TNS Global and TNS Hoffmann, its Hungarian company), 2 from Medián Opinion Poll Research (Hungary) and 1 from Ipsos. On a European level, a number of research take place for example in the framework of the Eurobarometer context. However, most of these refer to the issue of energy in a larger context<sup>28</sup> and are not directly related to the topic of nuclear energy. Of the Eurobarometer studies, only the one chosen for the pool had a direct relevance to the issue of support and/or opposition to nuclear energy in Hungary. Of research with international context, only the Hungarian aspects are studied in this chapter. It is important to note that no publicly known piece of opinion research from the period 2009 - 2013 has been excluded from the following comparison.

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<sup>&</sup>lt;sup>28</sup> EB 75.1. European Parliament Eurobarometer. Europeans and Energy, <a href="http://www.europarl.europa.eu/pdf/eurobarometre/2011/2011\_04\_21/SA\_EN\_Final.pdf">http://www.europarl.europa.eu/pdf/eurobarometre/2011/2011\_04\_21/SA\_EN\_Final.pdf</a>, EB 74.3 European Parliament Eurobarometer, Standard EB 74.3 on Energy, <a href="http://ec.europa.eu/public\_opinion/archives/ebs/ebs\_pe\_74-3\_synth\_en.pdf">http://ec.europa.eu/public\_opinion/archives/ebs/ebs\_pe\_74-3\_synth\_en.pdf</a>

	title	data collection	publication date	poll company	ordered by	focus	special features	methodology
1	Europeans and Nuclear Safety (Full public version), Special Barometer 324	September - October 2009	March 2010	TNS Opinion and Social	European Commission	attitudes to nuclear energy in EU countries	the only Eurobarometer issue that dealt with the topic of nuclear energy in the period 2009-13	EU countries, face to face, 1000 interviews (in Hungary) with people 15 years and above, weighed according to gender, age, region and size of locality, confidence limits +/- 3.1%
2	Global Citizen Reaction to the Fukushima Nuclear Plant Disaster(Outline for public)	March 2011	April 2011	Ipsos Global	Reuters News	social effects of Fukushima disaster	specifically focused to test reactions to Fukushima disaster	24 countries, online panel interviews, apr. 1000+ interviews (in some countries 500+), age 16-64, weighed according to demographics, est. error margin +/-3.1% (+/-4.5% for countries with smaller samples)
3	Should referendum decide? (Outline for public)	July 2011	August 2011	Medián	Origo	Should referendum decide about Paks extension?	part of an omnibus research	face to face interviews, 1200 adults, 100 vicinities, weighed according to size of locality, age, gender and qualification, confidence limits +/- 2-5%
4	Public awareness about energy sources and Paks NPP (Outline for public)	July 2011	August 2011	TNS Hoffmann	MVM/Paks Nuclear Plant	attitudes to nuclear energy and to the Paks plant	standard quarterly research of which 1/year is made public	unknown, but presumably same as TNS Hoffmann research in August 2013 (survey 6)
5	Nuclear attitudes in Hungary (Outline for public)	July 2012	October 2013 (!)	Medián	environmental organizations, headed by Greenpeace	attitudes to nuclear and to the Paks expansion plans	published over a year later than the actual data collection	unknown, but presumably same as Medián research in July 2011 (survey 3)
6	Public awareness about energy sources and Paks NPP (Full version)	August 2013	October 2013	TNS Hoffmann	Paks Nuclear Plant	attitudes to nuclear energy and to Paks plant	standard yearly research	face to face interviews, 1007 15+ adults, 100 vicinities, weighed according to size of locality, geographical region age, gender and qualification, confidence limits unknown

Table 21: Key data of opinion polls on nuclear energy 2009-2013

## 4.2.1. Comparison of key findings of the polls

In the following descriptions and comparisons, polls are ranked according to their chronological order.

#### 1. TNS OS, March 2010

Description: as a survey of the European Commission, this is the only issue of Eurobarometer that dealt with the topic of of nuclear energy in the period 2009-2013.

Key findings: 45% of Hungarians think that risks of nuclear power outweigh its benefits, while 43% think benefits outweigh its risks. The proportion of nuclear energy of all energy sources should be reduced according to 20% of Hungarians, increased according to 27% and maintained according to 49%. 50% of respondents say that nuclear risks are exaggerated, 34% believe they are underestimated and 2% say that nuclear risks are perceived correctly. 72% of Hungarians trust companies operating nuclear power plants and 26% disagree with this statement. 26% of pollees say that media provides enough information to draw conclusions about risks and benefits, while 71% says it does not. 20% of Hungarians confirmed they would like to be directly consulted and to participate in the decision-making about energy strategies, including nuclear energy.

#### 2. Ipsos, April 2011

Description: the poll was taken in the aftermath of the Fukushima nuclear disaster and focused especially on the study of how global attitudes to nuclear energy had changed as a consequence.

Key findings: use of nuclear energy for electricity production is strongly supported by 12%, somewhat supported by 29%, somewhat opposed by 30% and strongly opposed by 29% of the Hungarian population. Construction of further nuclear power plants is supported by 38% and opposed by 62%. 20% of Hungarians consider nuclear power to be a long term viable source of energy production, while 80% consider it as limited and to be outdated in the foreseeable future.

#### 3. Medián, August 2011

Description: part of an Omnibus survey commissioned by one of the leading news sites, Origo.

Key findings: Extension of the life cycle of the current plant is supported by 32% and opposed by 63% of the Hungarians. Construction of a new reactor is supported by 36% and opposed by 58%, while 43% oppose to both suggestions. 43% agree that nuclear energy authorities in Hungary are independent and provide sufficient information, while 48% disagree with this statement. 48% would support and 47% would oppose a national referendum regarding the destiny of Hungarian nuclear power plants. In case of a referendum, 60% would definitely or probably attend, and 36% would definitely or probably not join. 80% would prefer the state supporting the use of renewable energies, 8% would support that of gas and 7% that of nuclear.

## 4. TNS Hoffmann, August 2011

Description: the poll is prepared on a yearly basis on the commission of the MVM Hungarian Electricity Ltd., the state-owned mother company of the Paks NPP. Only limited and controlled content is shared with the public, in spite of repeated legal efforts from NGOs to have the full research made public.

Key findings: 73% of population agree that a nuclear plant is operating in Hungary, 58% support the planned extension of its life cycle. Construction of a new reactor is supported by 51% and opposed by 44% of Hungarians.

## 5. Medián, July 2012

Description: Commissioned by green NGOs, over a year separates data collection from publication of poll results. Focus is on possible Russian involvement in the planned expansion of the Paks NPP.

Key findings: On a scale of 5, the risks from the Paks plant are 3.58, the risk in general of nuclear power plants is 3.81 and the risks of nuclear wastes are 4.06. Of the various sources of energy, the state should encourage, according to 78% of the pollees, the use of renewable

energies, 13% suggested it should be nuclear and 10% suggested it to be gas. The extension of the life cycle of the existing NPP is supported by 35%, the construction of a new NPP is supported by 42%, while the latter is opposed by 51%. 50% of the population would support decision-making by a referendum and 56% declared they would definitely or probably attend it. In case the new NPP was built on Russian credit by a Russian state owned company, 25% would support the project and 66% would oppose to the project.

## 6. TNS Hoffmann, August 2013

Description: part of the yearly regular surveys commissioned by MVM.

Key findings (public part): 76% of Hungarians agree that a nuclear plant operates in Hungary, 43% believe that nuclear energy is the cheapest source of electric power. The nuclear power plant has especially high level of support in the 30 km vicinity of the plant<sup>29</sup>. 4 out of 5 Hungarians agree that a higher proportion of electricity should be produced locally. 41% of pollees would accept a maximum 10% level of imported energy, while a further 33% would accept a maximum 25% level import energy rate<sup>30</sup>.

Key findings (non-disclosed part): 51% of Hungarians believe renewables will be the most reliable source of energy for the next 10 years, while 17% each think it will be gas or nuclear. Safe supply of energy will be provided by renewables, according to 49%, while 23% say it will be nuclear and 17% believe it will be gas. 78% of Hungarians share that renewables have the smallest effect on the environment, while 10% say it is nuclear and 7% claim it is gas. 51% of pollees agree with building new nuclear reactors and 45% oppose to this. If it were built next to the existing plant, support would increase to 56%, against 40% opposition. Regarding the preconditions required to the expansion of the existing Paks plant, 57% would support to have a referendum, 13% would agree to a referendum in the 10 kilometers vicinity, 12% would tie it to a parliamentary decision, 9% to a government decision and 8% to a local referendum. In case of a referendum, 50% would support construction of a new reactor, 38% would oppose to it. 87% would oppose to putting the Paks NPP, currently state owned, into private hands while 11% would support this move. Extension of life cycle is supported by 64% of the population and opposed by 30%.

<sup>&</sup>lt;sup>29</sup> A separate piece of research has been conducted in parallel to test opinion of the citizens living closest to the

<sup>&</sup>lt;sup>30</sup> Currently this rate is at 30%

Only a limited part of the latter research findings are made public. Non-disclosed parts comprise topics that might not support narratives about perceived benefits of nuclear energy. These include that a relative majority sees renewables as the safest supply of energy, an overwhelming majority considers renewables as the most environment friendly source of energy, most pollees would support a referendum over the planned expansion of Paks NPP and an overwhelming majority would oppose to the privatization of the NPP. In summary, the comparison of the results of the findings looks as follows.

	title and conducted by	data collection / publication date	support nuclear energy	oppose nuclear energy	support Paks expand	oppose Paks expand	key additional findings
1	Europeans and Nuclear Safety (Full public version), Special Barometer 324 / TNS Opinion and Social	Sept Oct.2009 /March 2010					
2	Global Citizen Reaction to the Fukushima Nuclear Plant Disaster( <i>Outline</i> for public) / Ipsos Global	March 2011 / April 2011	41%	59%	38%	62%	
3	Should referendum decide? (Outline for public) / Medián	July 2011 / August 2011	-	-	36%	58%	
4	Public awareness about energy sources and Paks NPP (Outline for public) / TNS Hoffmann	July 2011 / August 2011	73%	25%	51%	44%	
5	Nuclear attitudes in Hungary ( <i>Outline for</i> public) / Medián	July 2012 / October 2013 (!)			42%	51%	50% support referendum on Paks NPP and 56% would attend, 66% would oppose Russian involvement, 78% would like state support renewables and 13% would favor nuclear
6	Public awareness about energy sources and Paks NPP (Full version) / TNS Hoffmann	August 2013 /October 2013	76%	21%	50%	38%	56% would attend referendum on future of Paks NPP and 50% would support extension

Table 22: Key findings of opinion polls on nuclear energy 2009-2013

Outcome of these pieces of research show significant variations (Table 22). To identify possible causes of differing results certain presumptions are made. It is supposed that each company followed the written as well as unspoken ethical rules and professional set of criteria. Furthermore it is assumed that the companies published the actual figures of their research. Research companies would not risk their reputation by agreeing to unethical or illegal practices. The cause of variations needs to be identified in the wider contexts of these pieces of research. Study should be made to see if differences in objectives and orientation of research could be the reason for differences. Specific answers to specific questions are defined by a number of details. Circumstances of actual polling are not known, including information regarding specific conditions of the interviews, list of exact questions and the full context of the research. Full comparison of pieces of research would only be possible if all factors of polls were identical. Nevertheless it is possible to accomplish comparisons, bearing in mind the similarities in the focus, sampling, methodology and professional standard of the organizations. Differences in findings of similar surveys can be attributed to a variety of reasons.

# 4.2.2. Possible interpretations of differences in findings

## Background and purpose of research

The TNS Opinion and Social research (1)<sup>31</sup> forms part of a regular series of pieces of research, commissioned by the European Commission to test the attitude of European citizens on various issues. The Eurobarometer series is both a tool for the Commission, and a service to the public. Nuclear issues sporadically arrive on the agenda and are usually related to general energy issues, climate change or handling of nuclear waste. In case of the Ipsos research (2) 24 countries were involved, in each of them a similar set of questions was asked (except for Japan). Apart of Reuters News there was no specific firm behind the survey, it was backed financially by Ipsos. The study focused on the effects of the Fukushima accident. The Medián research (3) was part of their omnibus survey, and the specific questions were based on the assignment from (a leading Hungarian news site) Origo. The research focused on the need and the viability of a possible referendum on the Paks development plans. Except for a poll 10 years earlier, Medián did not conduct any research in the area of nuclear issues before. TNS Hoffmann (the Hungarian arm of TNS Global) research (4) is strongly

<sup>&</sup>lt;sup>31</sup> Numbers in brackets refer to the chronological ranking of polls, as described at beginning of the chapter

determined by the fact that the state owned company committing to the research is actually the owner of the company operating the Paks NPP. The research, repeated on a yearly basis since 1990 (!), provides ammunition to both public communication about nuclear energy, and to setting of internal strategies regarding development plans. Bearing in mind the long term and close relationship between the owner of the research, the nuclear plant and the research company, a relatively low level of research independence is supposed. Medián research (5) is primarily a reiteration of the earlier research, with environmental organizations commissioning the poll this time and with a slight change of focus: instead of the issue of referendum it focuses on the attitude to development plans, especially with the inclusion of Russian state owned nuclear firms. The TNS Hoffmann research (6) is part of the regular yearly series of research to study attitudes to nuclear energy and the Paks NPP. A copy of the full version of the latest research findings was made available for the dissertation, allowing study of both public and non-disclosed parts.

A further point of differentiation can be the purpose of the poll. If the purpose is to provide reassurance, safety, comfort, it will then build towards questions that focus on the benefits of nuclear energy. However, if the purpose is to raise doubts, highlight controversies or initiate uneasiness, it may decide to focus on questions that raise risk awareness. The yearly TNS research (4,6) are good example for the *benefits oriented polls*, while the Medián polls (3,5) are examples for the *risks oriented polls*.

# Timing of the poll

The TNS OS research (1) is one of the EC polls on certain aspects of nuclear energy, focusing this time on the issue of safety. Comparison to other pieces of earlier research is not covered in its documentation. Ipsos Global (2), Medián (3) and TNS Hoffmann (4) are all in chronological proximity to the Fukushima accident. The accident set back confidence towards Japan and in nuclear technologies around the world (IAEA, 2013 and Edelman, 2012), though these setbacks are usually considered temporary only (Besley and Oh, 2013). Actually, testing the aftermath was the explicit purpose of the Ipsos Global research, while results of the Medián (3) and the TNS Hoffmann (4) polls may have been strongly influenced by the accident. The TNS Hoffmann (4,6) and the Medián (3,5) pieces of research can be considered part of a series that allows for comparisons, leading to in-depth knowledge of the subject and study of the critical points.

## Wording of questions

The actual wording adds to the identification or to the alienation with the topic. The TNS OS research (1) approaches the issue with rather abstract terms. Only 2 questions of the 20 have a personal reference: one enquires whether the person visited a NPP before, while the last one asks the pollee to weigh risks and benefits of nuclear power generation, with bearing in mind the interests of their family. The Ipsos Global research (2) builds on questions that directly relate to personal choices in terms of consumption of food or energy. The questions in the Medián research (3,5) and TNS Hoffmann research (4) tend to refer to more distant subjects to which emotional attachments are difficult to build. However, TNS Hoffmann research (6) does combine abstract terms with personal choices, for example in the case of personal decisions on how much more would people be ready to pay for electricity. Though the exact wording of all questions is not known, appearance of the questions in the charts or text of public communication give an indication to the actual wording. Certain typical cases can be noted that imply a breach to the standards. In a number of questions hidden statements and implied answers appear.

- Medián research (5): 'Should there be built a new NPP in Paks next to the existing one?' This implies an unnecessary doubling of capacities both in geographical sense and in terms of capacity.
- Medián research (5): 'Would you support the construction of a new NPP if it was built of Russian credit by a Russian state owned company?''<sup>33</sup>This implies and duplicates a hidden danger as well as asks for an answer to a complex question. The question actually consists of 3 parts financing of project, ownership type of company and nationality of company which may distort genuine answers.
- TNS Hoffmann (6): 'Would you be ready to pay a markup for the electricity, if it was generated of renewables and not nuclear power?''<sup>34</sup>The question implies a statement that electricity generated of renewables is more expensive than that of nuclear energy. Wording of this question also may prepare the ground to a later question that enquires about the kind of energy that is considered the cheapest to generate today.

33 In Hungarian: "Ön támogatná egy új atomerőmű megépítését, ha azt egy orosz állami vállalat orosz hitelből építené meg?"

<sup>32</sup> In Hungarian: "Pakson épüljön új atomerőmű a már meglévő mellett?"

<sup>&</sup>lt;sup>34</sup> In Hungarian: "Ön hajlandó lenen a jelenleginél többet fizetni a villamos energiáért, ha azt megújuló energiaforrásokkal állítanák elő szemben az atomenergiával?"

- TNS Hoffmann (6): 'Do you agree that a nuclear plant operates in Hungary?' This question has been widely and publicly criticized for its wording<sup>36</sup>, as it, in this form, asks opinion on an actual fact and therefore mixes information seeking with opinion seeking. True agreement with the existence and the operations to the NPP should be enquired by asking: 'Do you agree that a nuclear plant should operate in Hungary?' Instead of an expression of a statement referring to the present, it should rather, in subjunctive form, allow for the inclusion of personal opinions oriented to the future use of nuclear energy.

The overall problem with biased wording of questions is that it upsets the balance structure of opinion polls: acquiring information in order to learn about public perception, and then build on this during strategy development and message formulation. Instead, upsetting the balance puts importance of acquiring argumentative support ahead of learning the actual views of the public. This approach limits the ability to obtain in-depth insight into the public attitude. Furthermore, manufactured wording contributes to strengthening the concept of 'us' and 'them', and leads to emotional identification or to alienation. Subsequently, it may add to the construction of creating 'political aliens'.

## Order and structure of questions

The actual order of questions has a strong influence on the answers, however, except for TNS OS (1) and Ipsos Global (2) polls, there is a lack of information on the original order of questions. Consequently only the order of appearance in public communication can be noted. The current dissertation intends to identify what topics may have preceded the actual questions and, subsequently what the context of the most critical issue, the attitude to the Paks expansion plans may have been.

The TNS OS research (1) covers 5 topics. Right after the demographical questions, the issue of nuclear safety was touched first; there was no other topic before it. The nuclear issue was followed then by the topic of corruption. The Ipsos Global (2) research focused first on the readiness to consume food items previously imported from Japan, such as rice, noodles, fish, algae, following the Fukushima accident. The majority of pollees gave negative answers to these questions. These were followed by questions on support to nuclear energy and to further expansion plans of nuclear electricity production capacities. Based on the communication

<sup>&</sup>lt;sup>35</sup> In Hungarian: "Egyetért Ön azzal, hogy Magyarországon működik atomerőmű?" (ahelyett a formula helyett, hogy: "Egyetért Ön azzal, hogy Magyarországon atomerőmű működjön?")

<sup>&</sup>lt;sup>36</sup> Public criticism has been voiced for many years as the question is repeated in its actual form annually.

output, the first questions of the Medián research (3) focused on the independence of nuclear energy authorities and the credibility of their information. Answers showed an even split on these issues. These were followed by questions related to the extension of the Paks NPP life cycle and the expansion of the plant. The order of questions of the TNS Hoffmann research (4) can be presumed of the document acquired and made public by NGO Energiaklub<sup>37</sup>. The exact context of the questions is unknown, the series of questions supposedly starts with the regular question of the survey for 20 years: 'Do you agree that a NPP operates in Hungary?' Responses have reflected wide support to Paks NPP for 2 decades. These are followed by questions on development plans, to be pursued further by issues on Paks meeting European standards, and perception about the types of power plants that supply energy at the lowest cost.

The publicly communicated results of the Medián research (5) indicate that the list of questions started with identification of most important risks related to nuclear power production, followed by a question on the source of energy that should be most supported by the state. This is followed by the critical question on whether a further new nuclear power plant is needed next to the existing one, ending with the enquiry whether pollees would support a new NPP, if it were built on Russian loan and by a Russian state-owned company.

Obtaining the full presentation of the TNS Hoffmann research (6) indicates that the assumption on the order of questions of the TNS Hoffmann research (4) was presumably wrong. The full presentation indicates that the complete list includes 28 questions<sup>38</sup> (compared to the 5 that had been made public 2 years before). The first 5 questions refer to security of energy supply from various energy sources, environmental considerations of various sources of energies, and additional markup people would be ready to pay for renewable energies. The next set of questions concerns the Paks NPP and starts with soliciting general agreement to having nuclear power production in Hungary. These are followed by 5 questions on safety, followed by 3 questions on pricing and 1 on the acceptable share of imported energy. This is pursued by the 4 focus questions on attitude to expansion plans, followed by a question each on possible privatization and attitudes to the planned expansion of life cycle of the current plant. The last questions cover awareness and opinion on the Fukushima accident (5 questions) and 1 question asking feedback on the promotional truck moving around in Hungary and promoting the Paks NPP.

<sup>&</sup>lt;sup>37</sup> Information about the research was included in the documentation that was made public following a court case settling public access to documentation on Paks development plans.

38 Approximate number, based on the number of slides covering an independent question

In summary, the actual context and order of questions is critical. Especially in the case of Omnibus surveys it is difficult to tell, what actually proceeds the questions related to nuclear energy, and what effects they may have on the interpretation of later questions. When questions refer first to risks or accidents, than with good probability, pollees will show higher risk awareness during the whole interview. In case of questions referring to well known facts or questions where there seems to be a wide agreement on the positive aspects of nuclear energy, people will tend to show a higher level of *benefit awareness* during the poll. In the case of *objective driven polls*, the simple rule seems to be: 'Start with those questions that support your objective, and to which you expect to gain the biggest support. That will ease the whole process and help findings the conclusions one was looking for.'

## 4.2.3. Transparency of surveys and communication of results

A final point of consideration regarding the validity and credibility of the polls concerns how the findings are communicated. The TNS OS research (1) is part of the Eurobarometer structure where transparency in communication is a political prerequisite. The main objective of the Ipsos Global research (2), commissioned actually by a news service company, Reuters Thomson, is to communicate its results and build the Ipsos brand further. Communication therefore meets the criteria of full transparency, by allowing full public access to methodology and to the survey tables. Furthermore, it facilitates public communication of the findings through the development of publicly available and easy-to-use presentations and survey releases. Both Medián polls (3,5) allow limited access to methodology, to the order and wording of questions and to background information. Public outputs are communicated through the media, in the case of research (3) by Origo and in the case of research (5) by Greenpeace, the NGO heading a group of environmental organizations. The full research or the possibility of detailed backgrounders do not appear and nor are the surveys present on the website of Medián.

During communication of both the Medián and the TNS Hoffmann polls, factually debatable statements tend to be written in the titles of the press releases. The title of the press release issued by Greenpeace about the Medián research (5) claims that '*Two-thirds oppose to the Paks expansion*' <sup>39</sup> The body text actually explains that 51% oppose to the plan, while 42% support it. However, when the question also includes Russian involvement and Russian state

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<sup>&</sup>lt;sup>39</sup> In Hungarian: "Kétharmad ellenzi a paksi bővítést"

ownership of the construction company, then the share of opposition rises to 66%. Titles or communication of the TNS Hoffmann polls (4,6) do not reflect that the owner of the polls, MVM Hungarian Electricity Ltd., brings to the public a limited segment of the findings, with the majority of the findings being kept for company use. TNS Hoffmann does not take part in the communication of results. The title of the only and official press release on the poll (6), 'A growing number of people recognize the benefits of nuclear energy' <sup>40</sup> is not in any way related to the findings of the research, it does not derive directly or indirectly of its findings.

Actual communication of poll findings is strategically important for the companies commissioning the surveys. Presumably, these surveys are in fact designed for publication, to raise credibility of certain agendas and support the case of survey owners. Communication of findings does not mean full disclosure of survey results. Full access to outcome of the results in only granted in the case of the two international surveys, TNS OS (research 1) and Ipsos Global (research 2)). In all other cases, ownership control of polls mean at the same time limitations to public control, and this makes them vulnerable to manipulation.

## Consequences of differences in survey results

Differences in the result of the various opinion polls may have a boomerang effect. Lack of analysis of understanding differences may lead the public to loose confidence in the findings, or even the issue in general. On the other hand, proper analysis could result in a clear understanding of underlying reasons of differences, and lead to better understanding and even identification with the issue. Understanding the reasons for significant differences is therefore critical. Differing survey results exercise significant impact on public receptivity and awareness of the subject. Differing results may exercise negative effects on all elements of the survey process: the issue under research, the polling company, the company commissioning the poll and the persons involved themselves.

Possible effects of differing results include:

Loss in confidence regarding the validity of survey results

To overcome cognitive dissonance non-professional people may react by increasing indifference. Instead of efforts to interpret the results, they rather loose interest in internalization of the findings of the poll.

<sup>&</sup>lt;sup>40</sup> In Hungarian: "Egyre többen ismerik fel az atomenergia előnyeit"

#### Drop in confidence regarding the subject of the research

Another reaction might include a drop in confidence in the issue of nuclear energy. This interpretation of the results grows further the perception that this topic is complicated, should be left to experts to prepare and handle, and to politicians to decide about. This strengthens further intentions to withdraw the nuclear discourse of the public sphere.

## Contribution to the construction of parallel realities

Differing results contribute to the construction of parallel realities where each of the realities is supported by its own set of results. Instead of clarifying public understanding and better understanding, the existing division, regarding the perception of need and use of nuclear energy, is reinforced.

## Public opinion survey changes its role

The purpose of public survey changes: instead of interpretation tools for understanding the reality, they become active tools to influence reality and its perception. Each stakeholder commissioning a survey considers it as a tool to support its own argumentation.

# 4.2.4. A tool to overcome differing results: aggregate reporting

In 2010, the Organisation for Economic Co-operation and Development, OECD published a report summarizing findings of previous opinion polls, primarily Eurobarometer reports<sup>41</sup> (OECD, 2010). The purpose of the report has been to facilitate decision making of member states on nuclear related issues by being better informed. As stated in its foreword, 'the report brings together a number of particularly insightful public opinion polls and surveys about nuclear energy with the objective of making the assembled outcome available to a wider audience of decision makers and opinion leaders' (OECD, 2010:3). The foreword also states that 'OECD/NEA countries will only be able to make use of nuclear energy if a well-informed public considers that its benefits outweigh its risks, an opinion which is not yet widely shared in the countries polled'. Here again, it has a clear bias in order to promote the use of nuclear energy, while it does admit that in most countries there is no explicit support for nuclear energy. The text furthermore claims: 'Although the Eurobarometer poll did not directly address views on the cost of nuclear energy, it seems likely that people would be less opposed if it were clear that nuclear would reduce the price they paid for electricity'(OECD,

<sup>&</sup>lt;sup>41</sup> special Eurobarometer reports 227 and 297 on radioactive waste, nuclear safety (271), energy technologies (262) and climate change (300) as well as on EU energy policy (206a)

2010:29). This implies that generation of electricity from nuclear power is with lower cost than with other sources, which, in the case of newly started NPP projects, is highly debated. Even the OECD report refers to certain considerations when assessing the validity of an individual poll. It underlines that the possible vested interest of the organization that commissioned the poll can influence validity, and so can the wording, the ordering and the adequacy of the sample. It summarizes by saying that 'differences in wording and methodologies can produce misleading comparisons between the outcomes of different polls.' (OECD, 2010:11). Statements of the OECD report reinforce our earlier statement about the importance of the commissioning organization of the poll, the reasons and the difficulties in interpreting differing results, and the dangers of constructed research findings.

# 4.2.5. A tool to overcome differing results: conducting an independent research

Bearing in mind the controversies and the blurred overall picture of the existing polls, the author of the current dissertation decided to execute an independent poll to validate existing statements. Preconditions did not allow for the development of a full scale opinion poll covering every important aspect of nuclear energy. Consequently, the poll is limited to three closed questions with up to 8 answer possibilities each. Comparison with the other pieces of research, and consequently validation of any or all of the other pieces of research is limited. However, findings of the author's independent research may provide an indication to the validity of the findings of the other polls. The key data of the independent research are:

title	data collection	conducted by	comment	methodology
Nuclear attitudes in Hungary	June 2013	Ipsos	part of an omnibus survey	face to face, 1000 adults, weighed according to size of locality, age, gender and qualification

Table 23: Key data of independent poll

The poll included 3 questions (see Annex 4):

- 1. In your view, is there a need to build two further reactors in the Paks NPP?
- 2. Do you believe you have enough information about the expansion of the Paks NPP?
- 3. Do you think that similarly to other countries, expansion about the Paks NPP should be decided on a referendum?<sup>43</sup>

<sup>42</sup> The author of the dissertation expresses its gratitude to Ipsos Hungary for their kind partnership and contribution in allotting the research questions into their regular omnibus survey.

<sup>&</sup>lt;sup>43</sup> 1. Ön szerint szükség van-e arra, hogy két újabb blokk épüljön a paksi atomerőműben? 2. Megítélése szerint Ön elegendő információval rendelkezik-e a paki atomerőmű bővítéséről? 3. Ön szerint más országokhoz hasonlóan nálunk is népszavazáson kellene-e dönteni arról, bővítsék-e a paksi atomerőművet?

In the case of Q2 and Q3 the possible answers were crafted to give insight into the reasoning as well.

A high number of pollees, 46.5% preferred not to answer to Q1, choosing the 'don't know' option. In a detailed research the opportunity would have occurred to offer information in advance, and then come to the actual question. This could have increased response rate, however it would have influenced actual knowledge about the issue. Of those who answered, 52.5% opposed the plan and 47.5% supported the plan. The outcome confirms a modest majority of opponents, but the split confirms that the population is divided on this issue.

Regarding Q2, referring to the need of further information about the expansion, only 4% of pollees expressed satisfaction with the amount of information they had. 38% responded they did not have enough information and were not interested in obtaining more information anyway. 38% of pollees would be interested in having more information, primarily about the environmental aspects, followed by the economic-financial and the technical aspects. The political aspects for the respondents seemed uninteresting, and close to 20% admitted they did not know if they had enough information.

Regarding Q3 on the need for referendum, 33.4% would like to have a referendum, referring primarily to the reason that they consider this to be an important issue that affects everyone. 47.4% of the pollees felt a referendum is not necessary, referring to the fact that experts can decide better on this, and also expressing that anyway it will be decided by the politicians. Again, close to 20% of pollees did not give an answer to the question. The answers reflect that almost half of people do not want more information, they trust experts and politicians. One-third would like to have a referendum primarily because they believe it is an issue that affects everyone.

	title and conducted by	data collection / publication date	Hungarians supporting Paks expansion	Hungarians opposing Paks expansion	key additional findings
7	Nuclear attitudes in Hungary (Full version) / Ipsos	June 2013 / current thesis	47.5%	52.5%	need for referendum: yes: 33.4%, no: 47.4%

Table 24: Key findings of independent poll

Demographic distribution provides certain further points of information. In general, it can be affirmed that men would rather prefer expansion, while the relative majority of women would rather oppose to this idea. However, 52% of women do not know if there is a need for the planned expansion, in contrast to 38% of men with a similar answer. Men are more interested in the issue and feel they are better informed, than how women feel about the same issues. There is only one area where women significantly outnumber men in their interest for further information: in the field of environmental aspects. Interest in the issue of a referendum shows no correlation with gender.

Interest in and support to the Paks expansion plans correlates significantly to qualifications: the higher the education level, the more support is expressed to the planned expansion. Worthwhile to note that support of the highly educated is not unconditional: most respondents would 'rather prefer' expansion instead of 'absolutely prefer' it. Also, the referendum is supported relatively most by those with higher levels of education.

In terms of income, people with higher income feel they are more informed or, if not, would like to have more information than their fellows with lower income. Support to the expansion plans and regarding the referendum are not related to income levels. Significant correlation exists between support to referendum and level of feeling informed. The better informed the people feel, the higher support they express for a referendum.

People living in bigger cities feel better informed, while support to expansion plans does not show any correlation with type or size of locality. 26% of people living in cities would definitely be interested in more information about the environmental aspects, compared to 14% of those living in villages. Relative support to the referendum is the highest in Budapest, but even here a split prevails between supporters and opponents to the referendum. The relative majority in all other types of municipality opposes the idea of a referendum, stating primarily that it is the job of the experts to decide, followed by the statement that usually politicians decide on this and that it is a too complex issue for themselves anyway.

Finally, the age of pollees is not a significant factor in these questions.

In conclusion it can be said that supporters of the expansion plan are rather among the men and the better educated, while opponents are from women and with lower levels of education. Income level and age are not factors to be considered.

#### 4.2.6. Conclusions on surveys

Regarding the findings, it is apparent that the society is rather undecided, (feels) under-informed, is to a considerable extent uninterested and split regarding the Paks expansion plans. On a personal level, considerations about the issue of the expansion do not appear important. The outcome represents a low level of risk and benefit perception, where answers do not reflect the issue having a significant weight. Respondents do not see what is at stake and how any decision on that issue would influence their lives. It stands as a project that has not much relation to everyday worries, and is one of those matters for which dedicated people should be responsible. Perception of the nuclear development issue reflects that, as this is a complex matter, it needs to be in the hands of those who have the expertise to handle it. The complexity of the issue alienates the people of actually being truly interested in the outcome of the expansion plan or express strong support to a referendum.

In summary of all pieces of research, the conclusion is that a significant part of the population lacks information and interest in the nuclear issue. In the public perception, the connection between nuclear and the everyday issues are not connected. Lack of interest and involvement conflicts however with the views of a relatively significant part of the population, that would like to have their say in the decision and would prefer a referendum. The significant gaps and differences in knowledge, awareness and interest leave space for further intensive communication, be it for informative or manipulative purposes.

Regarding the polls, in conclusion, in the case of these polls, their mission to explore attitudes is limited. Most of them primarily serve to provide argumentation to predesigned narratives. As details of creation and structuring of the polls are unknown, the published outcome does with high probability not provide exact reflection of the actual outcome, and leaves room for individual interpretations. Finalization of outcome and communication of results is subjugated to the utilitarian aspects of poll making. Owners of the polls not only provide the resources, but also express an expectation regarding its outcome. Instead of widening the public sphere, opinion polls become tools in strengthening a manufactured public sphere. In terms of further relevance to earlier statements, the creation and communication of the polls underline the agenda setting activities, reinforce the notion of political alienism built on 'us' and 'them', as well as expand the divide between risk-oriented and benefit-oriented pieces of research.

#### **CHAPTER V: THE EUROPEAN CONTEXT**

A further field of reference for political, professional and media discourses is the area of international nuclear discourses. Actors of the Hungarian nuclear discourse use international references, especially those of other European countries, to reinforce own messages. The discourse in Europe provides a valid referencing and consequently increases the power of argumentation.

#### 5.1. Overview of situation

Social discourse on the future of nuclear energy in Hungary cannot be complete without its international context. Most directly, it is linked to the country being a member of the European Union. Analyzing the nuclear agenda of countries of a similar situation may lead to better interpretation of trends, layers of discourses and opinion poll findings.

Half of the 28 member countries of the European Union have existing nuclear power plants in operation<sup>44</sup>. Share of nuclear energy in the national energy mix ranges from minimal (Netherlands, 4%) to dominant (France, 75%). History and current status of nuclear energy differs considerably in the various countries. An overview of status shows (Table 25) status of nuclear energy in the EU member countries<sup>45</sup> in relation to what plans exist for the future about nuclear energy, and in what form the relevant decision has been made.

The table has been created to help identify patterns in European countries along two criteria: content of decision regarding the use of nuclear energy and the form of how the actual relevant decisions have been made. Identification of patterns helps understand *motives and methods* of decision-making.

<sup>45</sup> Beyond the 14 EU countries with NPPs in operation the table includes Austria, Italy, Lithuania and Poland were currently no NPPs are operational, as well as non-EU member Switzerland

<sup>&</sup>lt;sup>44</sup> Slovenia and Croatia owns jointly a NPP in Slovenia. With Croatia also included, 15 member countries can be considered as generating nuclear energy

# Decision nuclear energy (date of decision in brackets, modification of decision in bold)

form of decision	abandon nuclear energy	keep nuclear energy	develop nuclear energy
referendum	Austria (5 November 1978) (Zwentendorf NPP project was abandoned before completion)  Sweden (23 March, 1980) (in June 2010, revision by parliament abandoned phase-out legislation)  Italy (8 November 1987) (one NPP project was abandoned before completion and two operational NPPs were shutdown) (13 June 2011) (renewed government plans to relaunch NPP development were put to halt in another referendum)  Lithuania (14 October 2012) (in October 2013 revision of decision is suggested by government)		
parliament resolution	Belgium (2002, followed by a government policy statement attempt on 13 October 2009 to revise decision) (phase-out is planned by 2025, however NPP operators lobby hard to have the deadline extended by 10 years)  Germany (31 July 2011, following a government decision on 14 March, 2011) (shut down 8 of 17 reactors with immediate effect with all other reactors to follow by 2022)  Switzerland (8 June 2011) (phase-out with expiry of planned lifetime of NPPs by 2034, green NGOs lobby for earlier phase-out by 2029)		Hungary (March 2009) (preliminary approval to investigate building further reactors to Paks NPP, followed by resolution in February 2014 approving actual expansion plans)  Poland (May 2011) (following a government decision in 2005, the regulatory framework was set by parliament to build at least two NPPs by 2030. Local referendum in February 2012 in Mielno, one of the potential sites, refused hosting planned NPP)

form of decision	abandon nuclear energy	keep nuclear energy	develop nuclear energy
	Spain (1983) (phase-out is planned as NPPs reach their projected lifecycle, however strong lobbying is exercised to delay phase-out)	Netherlands (2010) (government overwrites 1994 parliamentary resolution of phasing out nuclear energy, and is open to new construction as existing NPP reaches end of lifecycle)  France (2012) (announcement to reduce share of nuclear related electric power from 75% to 50% through closing oldest NPPs by 2025, at the same time construction of new NPP at Flamanville-3 continues)  Slovenia (April 2013) (government decides to put plans to construct new reactor on hold, while the existing reactor remains operational until 2021)	Bulgaria (11 December 2013) (government plans announced to continue development of new NPP. Earlier, 27 January 2013, referendum on future of other NPP was invalid due to low turnout)  United Kingdom (April 2013) (government issued permit to plan two new reactors at Hinkley Point)  Finland (December 2003) (government decided to build new NPP. In spite of considerable delays and unprecedented over-costs of construction of the Olkiluoto-3 NPP, the build of further NPPs was decided in April 2010)  Czech (2010) (government decided to add further nuclear capacity to the currently operating 2 NPPs. However, actual decisions on planning and building are being delayed and program may be put to halt in total)  Romania (since 2000)
			(beyond having completed a construction previously abandoned, the government plans to add further nuclear capacity to the currently operating 2 NPPs but plans are hindered due to financial constraints)
	tone decisions on use of nuclear energy		Slovakia (January 2006) (government decided to renew plans to extend existing nuclear capacity with finishing construction of two new reactors and capacity increases)

Table 25: Milestone decisions on use of nuclear energy in EU countries and Switzerland

#### 5.2. Conclusions on decision making

Regarding changing directions of nuclear issues certain important patterns can be identified.

#### 5.2.1. Countries with decision to abandon nuclear energy

## a. Trigger of decisions

Increased risk perception following nuclear accidents, and actual effects of recent nuclear disasters play a direct role in decisions to abandon nuclear energy. The Three Mile Island accident in 1979 directly influenced Swedish decision, the Chernobyl disaster in 1986 brought Italian referendum to stop use of nuclear energy, while the Fukushima disaster in 2011 triggered German and Swiss parliamentary decisions to stop use of nuclear energy, as well as resulted in repeated Italian refusal of nuclear plans. In other cases differing motivations can be the drivers of non-nuclear resolutions: maintenance of perceived independence and expected costs of new nuclear plant (Lithuania), green party participation in the government (Belgium) and strong preference to renewable energies against nuclear energy (Spain). In all cases *perceived risks exceeded potential benefits* of projects, and resulted in decisions to stop use of nuclear energy.

### b. Validity of decisions

Decisions of a national referendum in Sweden were overruled 30 years later by the Parliament, with a majority of 2 votes. A year after the national referendum Lithuanian government plans to revise referendum decision, while the Italian government intended to overwrite referendum and was only stopped by a second referendum from re-launching nuclear development plans. Phase-out commitments of Belgian parliament and of Spanish government are lobbied against for revision, to have at least the deadline for phase-out extended and allow life cycle extension projects. There has been no change in stance in the case of Austria that first passed a law in 1978 prohibiting the use of nuclear energy for electricity production, and then installed the non-nuclear nature of the country in its Constitution in 1999. Germany and Switzerland have also stood firm to their 2011 legislations. Regardless of the actual form of decision-making, validity of actual outcome is not questioned. However, a number of cases prove that *decisions are usually not considered infinite*. Government intentions to change previous legislation were successful in the case of

Sweden, unsuccessful in Italy and are still pending in Lithuania. Business actors are pursuing efforts to have Belgian and Spanish phase-out legislation reconsidered. Actors initiating change in previous resolution argue with changes in external conditions, inappropriate access or content of previous information (Lithuania) and business rationality (Belgium, Spain). Effects of nuclear-related events and internal political and economic motives are primarily prone to influence existing *status quo*.

## 5.2.2. Countries with decision to keep nuclear energy

## a. Trigger of decisions

Changes of external conditions and of internal capabilities are the triggers to decisions behind keeping nuclear development plans open. Though vastly different in many respects, the group of Netherlands, France and Slovenia share openness to continued use of nuclear energy. The Netherlands and Slovenia are considering construction of new reactor(s) as existing ones face phase-out, while France, the global leader in nuclear energy production is committed to keep share of nuclear in the electricity production, even if at a somewhat lower level than previously. Argumentation for maintaining nuclear energy production evolves around business rationale and meeting of CO2 emission goals. However, in the case of the Netherlands and Slovenia, keeping nuclear energy can also be viewed as a result of indecisiveness whether nuclear energy should be developed or phased out. With the exception of France, *risks and benefits in these countries are still weighed* and result in the current situation. France still considers benefits of nuclear energy to override risks, but admits presence of risks through lowering dependence on nuclear related electric power.

# b. Validity of decisions

As the current directions derive of decisions made in 2010-2013, at this stage, in terms of time, it is not yet possible to discuss validity of these decisions.

#### 5.2.3. Countries with decision to develop nuclear energy

## a. Trigger of decisions

Commitment to expand nuclear capacity prevails in a significant group of the countries. According to the public narratives, the main motives for development are reduction of share of imported energy (Hungary, Czech, Slovakia), meeting of CO2 emission targets (United Kingdom, Poland), economic rationality of nuclear energy production (Bulgaria, Romania) and perceived technological qualities (Finland). However, especially in the post-Fukushima period, with the tightening criteria of safety measures, the growing investment and operational costs as well as expanded planning requirements, the time demand for establishment of new NPPs is extended considerably. Significant delays and cost overruns at current French and Finnish nuclear projects reinforce perception of complexity of project planning and execution. Development plans are driven by the perception of benefits overriding potential risks.

## b. Validity of decisions

Plans to develop nuclear energy capabilities are currently valid in these countries. However, the biggest threat to the validity of these plans are the difficulties of planning as described above. Increased focus on planning and construction, and extended time and budget needs do not eliminate emergence of external factors. On the contrary they solicit the emergence of new challenges, be them political (Russia, planned supplier of a number of nuclear plans in Europe being involved in the Crimean crisis, spring 2014), technological (fast development of alternative renewable energy technologies, and possible advance of shale gas exploration), legal (EU Competition Commission may decide to stop perceived national state involvement in nuclear development projects) and financial (financing of nuclear projects having a close relation with the general credit standing of the specific countries). From the perspective of nuclear development plans, each of these creates significant risks. As a consequence of extended risk assessment processes and delayed projects, debates about the specific projects continue even after parliamentary or government decisions are made and consequently influence planning of the project. The classical linear structure of project planning is blurred and turns into a permanent process of planning, assessment of the situation, analysis of the internal and external factors and performing an ongoing risks and benefits analysis.

# 5.3. Prevailing narratives in Europe

The issue of nuclear energy does not rank high among the critical ones for people living in the European Union (Eurobarometer, 2012), even if considered in combination with environment and climate issues. On a list of 13 possible problems, the complex issue of environment, energy and climate ranked only 11th, with 5% of the EU citizens granting it any importance.

The detailed analysis of the subject of energy indicates that only issues directly relevant to the citizens are of consideration. Stability of energy prices, the increase in the share of renewable energies, guarantees of energy supply and ways to increase energy efficiency are of importance, while the subject of nuclear energy does not emerge (Eurobarometer, 2011).

In spite of not being among the dominant issues for the citizens, the subject of nuclear energy is a matter of political, media and professional discourses. These discourses often reflect presence of certain imbedded values. An outline of the discourse of certain selected EU member countries is given below<sup>46</sup>. It may be argued that the selection of the countries is somewhat arbitrary, however the intention has been to include a cross section of countries that represent EU member states, by differences, among others, in attitude to and perceived importance of nuclear energy, country size and economic power.

## 5.3.1. Morality and altruism - the Netherlands

Benefits and risks are weighed against each other based on morality, where both advocates and critics of the use of nuclear energy refer to arguments deriving of personal norm systems (de Groot, Steg, 2010). The norms of the individual create a link between weighing the benefits and risks on the one hand, and willingness to act on the other hand. The existence of strong personal value system norms is linked to the willingness to act. The level of willingness to act differs between supporters and opponents of nuclear energy, with opponents expressing a higher level of readiness to act. The most often expressed criticism against the use of nuclear energy is the immoral nature of the unsolved issue of radioactive waste and of used fuel. Both the legacy for the next generations or its export to other countries reflect irresponsible and immoral attitude.

In everyday life personal norms are not necessarily noticeable, however they become triggers of action when it is realized that non-moral action may lead to detrimental consequences (Schwartz, 1977). Expected positive effects are also motivators of actions based on personal norms (Schwartz, Howard, 1981). The issue of morality is raised with claimed intrusion into the order of nature with potentially significant moral implications (Sjoberg, 2000, 2004).

<sup>&</sup>lt;sup>46</sup> In this part the author built on a previous presentation and research: *Safety Narrative of Nuclear Energy* at the Conference of the Culture of Safety and Defence, Gödöllő, 14 June, 2013 and the publication of the text *The Issue of Safety and Security in the Discourse about Nuclear Energy in Hungary* in the consequent conference e-book, available at: http://psharg.com/Preview/gabor-sarlos.html

From the perspective of efforts related to global warming, it has been noted that altruism is the basic value prerequisite of an environmentally aware behavior. For the individual, environmental awareness implies reduced consumption, in hope that the society will use the benefits of more favorable environmental conditions. Having the community goals realized requires giving up on individual goals. The price of giving up is a burden for the individual, while the whole community can reap its benefits. However, benefits are only significant, if a considerable number of individuals give up on consumption. In case of issues where costs and benefits are not closely related, changing mentality remains a challenge however.

### 5.3.2. Level of trust - United Kingdom

Risk perception of a specific issue reflects the level of trust towards the operators of the given system (Renn and Levine, 1991; Johnson, 1999; Poortinga and Pidgeon, 2003b). The complex role of the UK government in nuclear regulation and its relation to the nuclear industry contributes to complex results regarding level of trust. (Poortinga, Pidgeon, Lorenzoni, 2006). 32% of British agree that existing rules are sufficient to control the nuclear industry while 26% oppose to this statement. 33% each agree and disagree with the claim that the British government regulates nuclear issues in a satisfactory manner. At the same time 41% of respondents think that the government is too much influenced by the nuclear industry. 39% of pollees express doubts about the nuclear industry, if it would operate nuclear plants in a safe and secure way, while, in another question, 41% agree that the British nuclear industry has good reason to be pride about its safety records. The issue of trust can be extended to a cross section of actors related to the nuclear issues (Bickerstaff et al, 2008). The highest level of trust is towards environmental organizations and scientists at universities and environmental groups. Government and the nuclear industry scientists lag behind, while the highest level of distrust is shown against nuclear corporations. Competence, care and consensual values form trust-building factors (Johnson, 1999). The first refers to the competence and professional expertise of the members of the nuclear industry; the second one includes an open attitude and the readiness to communicate, while the third one covers the basis for having a common ground between the individuals and the effected company.

Following a shift in perception, British population accepts, but not without condition, the need of nuclear energy as a response to the global warming challenges. A minority of the UK population expresses unconditional support to the use of nuclear energy. '*Reluctant acceptance*' (Bickerstaff et al., 2008) is expressed by those who, weighing the risks of the use

of nuclear energy, accept the need of its use, as 'there is nothing better instead'. These respondents are fighting with resignation, discomfort and frustration. The least support is shown by those who are critical towards the issues of climate change, the security of energy supply and who put high priority to environmental values. The researchers summarize this by saying that the issues of climate change and secure energy supply can only have a limited impact on the support of nuclear energy. Significant growth in the proportion of supporters would only appear once the other, better-preferred options had all run out. Confusion about trust is built further by contradicting results of different pieces of research. Of 17 different pieces of research overviewed by a British Parliament committee, 3 showed a clear but not unconditional support to nuclear energy, 8 reflected divided public opinion, while the majority in further 6 studies refused the extended use of nuclear energy. The argumentation in the latter studies focused on distrust against the method of nuclear waste disposal, the distrust in the security systems of the nuclear plant, fears about the deconstruction of the nuclear plants as well as preference for other energy sources. Confusing opinion poll results reconfirm our earlier notion about possible inconsistencies of the nuclear-related pieces of research.

# 5.3.3. Energy security - Lithuania

In Lithuania, three levels of discourse on energy security are identified (Genys, 2013). Political discourse creates the framing that the purpose of the energy policy is to provide energy security. As underlined frequently in public, this is an issue of national importance. Significance is reflected by the use of national symbolism in the discourse when talking about energy security; therefore politicians frequently build on terms such as 'liberating society from the energy trap', 'national goal' and 'energy independence'. Argumentation for energy security often resonates geographical threats, especially from Russia.

Scientific discourse operates with rational argumentation, and interprets events and possible scenarios in a broader and more complex approach. Processes are analyzed and specific projects, including the nuclear energy development plans, are identified through their strengths, weaknesses and uncertainties. Scientific discourses do not expand the borders of scientific events, and usually take the form of dissemination of research results.

Media discourse on energy security has nuclear energy development plans in the focus, and is dominated by politicians and the political discourse. Media discourse does not cover a deeper assessment of energy security situation and appearance of diverse opinions does not exist. The environmental, cultural and security aspects of energy development projects are not represented. Independent investigative journalism or reflections to the scientific discourse are not present in the media.

#### 5.3.4. Technological competence - Finland

Perceived technological competence of the country and of nuclear power generation are the key drivers in Finnish narratives on nuclear energy (Fjaestad, Hakkarainen, 2013). A general consensus prevails among politicians and businesspeople, that the key element of maintaining competitiveness of Finnish industry is availability of low cost, reliable and domestically produced energy. This confidence is further reinforced with the advanced development plans of a final disposal facility for nuclear waste. The relevant Finnish authorities in charge of nuclear safety enjoy high-level public trust as reliable and independent regulators. Any discourse about safety of use and the future of nuclear energy emerge is commonly waived by the notion that nuclear accidents happen among totally different political or geographical circumstances. There is a self-proclaimed limitation on nuclear development by the government, which has decided not to grant further decisions-in-principle during its term, but agreed to the processing of a number of decision-in-principles already approved. On nuclear issues most political parties give freedom to their members of parliaments to cast their votes and do not bind them in an obligatory manner. Technological competence is perceived both as a facilitator of execution of nuclear development plans and the main reason to continue these projects. However, the population seems to be divided on the nuclear issue with the majority expressing in 2009 and 2010 that following the finishing of the current NPP construction, Finland should not build any further reactors<sup>47</sup>.

#### 5.3.5. Managing risks - France

With the highest share of atomic power in generation of electricity, the second highest capacity and number of reactors, and being one of the leading countries in terms of nuclear technology, France is a global leader in nuclear power generation. As the country has an influential position in nuclear energy related issues, analysis of nuclear discourse may have a special significance on a global scale as well. Importance of nuclear energy and technological

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<sup>&</sup>lt;sup>47</sup>Finns Remain Opposed to Additional Nuclear Power Reactors, Yle, 29 March, 2010, <a href="http://yle.fi/uutiset/finns\_remain\_opposed\_to\_additional\_nuclear\_power\_reactors/5536424">http://yle.fi/uutiset/finns\_remain\_opposed\_to\_additional\_nuclear\_power\_reactors/5536424</a>, accessed December 2013

competency leave their mark on the perception of nuclear energy. Support to nuclear power is strengthened further by high level of trust towards the nuclear establishment, which has both the political power and the technical competency to offer a safe source of energy production (Weinberg, 1991). Nevertheless support to nuclear energy should not be considered 'blind'. The majority of the French population are aware that nuclear power production has considerable risks, with 63% of French adults confirming risks of nuclear plants (Bastide et al, 1989). In public attitudes to nuclear energy, considerable skepticism can be observed, even growing to the extent of mass protests (Brouard, Guinaudeau, 2013). Both the support to nuclear energy and the level of risk awareness is high.

'Grounded risk taking' can be referred to a number of factors:

- 1. Trust in political system and in competency of authorities reinforce feeling of shared risk taking.
- 2. 'Grounded risk awareness' implies manageable risk taking. The density of nuclear reactors in France entail that most of the population would have direct experience of living in the vicinity of a NPP. Experience of day-to-day 'co-habitation', possible economic and employment benefits as well as psychological identification with the nuclear agenda all result in perception of manageability of risks (Maderthaner et al, 1978).
- 3. Altruistic feelings and agreement to accommodate the interests of the society may also generate a more positive than average attitude towards nuclear energy, and contribute to perceived low level of risks.

In a detailed research of all the possible factors reinforcing grounded risk taking, only the correlation with perceived economic benefits was validated (Rogers, 1984). Notably, citizens of technologically advanced countries seem to have a higher level of risk taking. In the USA, in the case of nuclear energy, 31% of respondents belong to the group of acknowledged risk takers, who are aware of the risks of potential nuclear accidents, but still support the increased reliance on nuclear power (Greenberg, Truelove, 2011). A detailed analysis shows that 'acknowledged risk takers' are highly represented in four groups: among the elderly, those who have a high level of confidence in the energy production companies and the authorities exercising control over them, those with a strong conviction that energy production provides an important contribution to the development of the local economy and those who have a strong set of individual values.

#### 5.3.6. Responsibility – Switzerland

Multiple layers of responsibility characterize the case of Switzerland. Responsible attitude to nuclear energy and its environment is reflected by an attitude of participatory decisionmaking as well as deliberative and discursive exchange of information on critical aspects of nuclear energy (Visschers et al, 2011, von Roten, 2013). Of all possible aspects and potential risk hazards of nuclear energy, with 95% of the respondents agreeing, handling of radioactive waste is considered the most critical (TNS, 2013). This is a reflection of responsibility towards the following generations. A further reflection of responsibility is the acceptance of expertise and technological knowledge, together with openness and respect of information from NGOs and scientists (TNS, 2013). In 2008, 7% of the Swiss population expressed total support to nuclear energy and a further 33% was fairly in favor. The 40% proportion of total supporters remained stable (41%) five years later, in 2013. However, the proportion of opponents increased significantly, primarily due to the sharp rise in number of those totally opposed to nuclear energy. The share of those fairly opposing decreased from 38% to 37%, however the proportion of those totally opposing increased from 14% to 20% of the population, resulting in a total opposition of 57% of respondents.<sup>48</sup> The nuclear discourse in Switzerland is characterized by an open exchange of information and of opinions, reflected in viewpoints that at certain stage may appear contradictory. The rationality of the discourse is indicated by the ability of the pollees to analyze various factors separately. In contrast to the current opposition, a majority would turn supportive to nuclear energy in case the situation of nuclear waste was solved. As to the findings, 16% of all respondents would be ready to turn from opposition to support if a long term and secure solution was found for handling of radioactive waste. (TNS, 2013).

Research proves remarkable differences in terms of attitudes to nuclear energy. Geographical location and the linguistic divide (Diekmann et al., 2009, von Roten, 2012) are important points of differentiation, and so are the gender issues and the ideological differences. German speaking Swiss are more supportive to nuclear energy than the French speaking population, men are more in favor than women, while as those who identify themselves on the right are significantly more in favor of nuclear energy than those who are on the left (TNS, 2013). This may explain why differences in views on nuclear energy are described as reflection of choices between values related to ecological or economy focused development models (von Roten, 2013). Finally, quite exceptionally in Europe, the state plays a very limited role in being

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<sup>&</sup>lt;sup>48</sup> Share of "don't know" dropped from 8% to 2% of respondents.

involved in the discourse. It rather pictures itself as the watchdog or facilitator of the process. In contrast to the stateification process describe earlier, it takes a neutral position and this seems to be appreciated by the citizens through respect of information that would come from the state.

#### 5.4. Risks and benefits in the European nuclear discourse

Indisputably, decisions of European countries on nuclear energy, as well as the various discourses reflect existence of *various narratives*. The construction of reality differs in each case, the assessment of the balance of nuclear related risks and benefits change not only from country to country, but over the years may lead to *opposing views and decisions* than what had been thought and decided years before. Discourses emerge as these narratives confront with each other. The core difference between the various narratives can be summed up whether the perceived benefits or the perceived risks are of bigger importance. The *balance of risks and benefits* not only gives a direction to the national discourses, but also serves as argumentation and basis of decision-making. Acknowledgment of the increased timeframe needed for the realization of a nuclear power plant, due to more and more complex planning, safety, financing and licensing processes, is unavoidable. The assessment of current and future situations as well as *extrapolation of trends* is more important than ever.

Risks and benefits may provide the overriding framing to nuclear discourse. A number of pieces of research serve to understand their nature and their relationship. It is argued, that there is no direct relationship between risks and benefits (Thomas et al, 1979). Along a factor analysis of 5 various sources of energy, 3 risk dimensions, psychological and physical hazards, environmental hazards and indirect hazards, for example of political nature, were identified along with 2 benefit dimensions, economic and technological. It has been found that no link exists between the risk dimensions and the benefit dimensions. Presumably, even in a repeated research with a further benefit, the environmental aspects being listed, the research could bring similar findings. This actually confirms an earlier statement related to the Hungarian political discourse, where cost factors and environmental considerations were listed both as risk and benefit factors. This approach is furthermore supported by a study that underlines that the same factors can reflect both risks and benefits (Otway and Fishbein, 1977). The study claims that psychological aspects, the socio-political context, environmental effects as well as technical and economic consequences can all be considered as any of the 2 factors.

Admission of both risks and benefits is reflected in a growing number of trade-off narratives. In this framing, the risks are admitted, however they are positioned as costs in order to enjoy the benefits. Following the reframing of nuclear discourse in UK, among others, support of nuclear energy is growing when evaluated in the context of climate change. In these cases nuclear energy is presented as the solution to fight global warming. Findings of opinion polls confirm that support to nuclear energy grows significantly once positioned as a contributor to the reduction of greenhouse gas emissions (Rosa and Dunlap, 1994). A later survey by Los Angeles Times/Bloomberg survey reported that 61 % of pollees endorsed nuclear energy as a tool to fight climate change, which is about 10 % higher than in another survey, which did not connect the topic of nuclear energy with that of climate change (Simon, 2007).

With the issue of personal safety and security gaining growing importance, an earlier statement may be reinforced, that the public dominantly frames issues in the context of safety, while benefits are always secondary only (Midden, 1986). This distinction between perceived risks and benefits is advocated further (Slovic, 1987), claiming that the perceived dread, the fear or risks is the most important factor. The study showed a high level or correlation between attitude and risks, but the relation between attitudes and benefits showed low level of correlation. Perceived risks and not the perceived benefits seem to be the main drivers behind the attitude towards nuclear power.

It is stated that in spite of a possible imbalance between importance of risks and benefits, current and future discourses on nuclear energy are to be strongly guided by the perceived risks and benefits. Understanding changes in the social environment and elaborating credible narratives will prove irrelevant unless risks and benefits are accounted for. This assessment needs to be done separately for each case and maintained up-to-date. Assessment of a complex set of future risks and benefits, the preparation of a *Perpetual Risks and Benefits Repository* becomes therefore the key element on which not only nuclear power related narratives, but the relevant decisions need to be based as well. The preparation of the Perpetual Risks and Benefits Repository would allow each country to monitor all the relevant trends, including socio-environmental changes, to perform continuous tracking and planning of its nuclear programs. Ultimately, optimal decision-making and process control systems can be established in the nuclear field.

## CHAPTER VI: THE NEED AND THE PRECONDITIONS OF A RESTRUCTURED NUCLEAR DISCOURSE

#### 6.1. Triggering the discourse: signing of the nuclear agreement with Russia

The 13 January 2014 brought an unexpected turn in the discourse about nuclear energy in Hungary. That day, in the presence of Russian President Vladimir Putin and Hungarian Prime Minister Viktor Orbán, the general director of Russian nuclear energy giant Rosatom and the Hungarian Minister for National Development signed an intergovernmental agreement for the construction of two new units at the Paks NPP. To secure financing of the construction, Russia agreed to offer a loan of up to 10 billion euro.

The signing of the contract caught the public, and, apparently, the majority of the political and professional stakeholders by surprise. The previous narrative and the overwhelming impression was that even if, due to the existing Russian technology reactors in Paks, Russian suppliers would have an advantage when bidding for the delivery of the new reactors, however it would be proceeded by an international bid to create competition. Nobody expected 'announcement of the winner before the actual shot of the starting gun', Previous political narratives underlined the importance of careful consideration, involvement of the public, or at least of the professional circles, as well as providing of a transparent procedure. Until about November 2013, the importance of an international tender was repeatedly emphasized in government interviews.

It cannot be claimed that no signals at all have preceded the signing of the agreement. About three months earlier, mentioning of the significance of the international bid faded out of media, interviews started to appear underlining importance of continuity and compatibility of technology with the existing nuclear technology in Paks. Minister of State, János Lázár, at a meeting of the parliamentary committee of economic affairs in mid-December, highlighted significance of cooperation with Russia in a range of fields, including nuclear technology. As noted before, the political narrative of the nuclear development previously took a notable change, and the summer 2013 the expression has moved from 'expansion of Paks with two new reactors' to 'maintenance of nuclear capacity', claiming that the current 4 reactors in Paks will cease to operate in the 2030s, and therefore ample preparation need to be pursued to

<sup>&</sup>lt;sup>49</sup> Gábor Sarlós: Atomcsend - Túléli-e Orbán az oroszok behívását? / Nuclear silence - Will Orbán survive inviting the Russians in, Magyar Narancs, 23 Jan 2014, available at: http://magyarnarancs.hu/publicisztika/atomcsend-88392

'maintain capacity'. In the media narrative, an increasing number of normative statements and appearance of confronting views indicated approaching to decision points. However, all technological explanations and economic argumentations aside, the news of signing of the contract took the majority of the Hungarian public, both experts and lay public, by surprise.

The signing of the extension of the Hungarian - Russian cooperation treaty on nuclear energy resulted in a sudden intensification, and in many respects, change in public discourse. The actual development of events, and the intention to provide framing to what the agreement actually contains, what is behind and what it all means resulted in the sudden proliferation of narratives. Analysis of the narratives and of the development of the discourse may provide an important insight into understanding the differences in narratives and the extended discourse. The analysis of the discourse on nuclear energy and on the Paks expansion project is based on the comparative analysis of the periods October - December 2013 and January - March 2014, in practical terms before and following the signing. Choice of periods was driven by the need to identify and compare trends, and exclude over-dominant effects of single events. The analysis of narratives is based on a 'snap-shot methodology' that focuses on the integrated analysis of a variety of sources. This research builds on the following sources:

- Hungarian language 'traditional' media
- websites of individual actors
- professional developments
- public events
- opinion polls

#### 6.2. Changes of meta-framings of the nuclear agenda

The analysis indicates the interpretation of the post-decision situation has required adaptation of previous narratives. All stakeholders needed to redefine their attitude to the situation and develop their narratives accordingly (see Table 26).

actor (in order of activity in the post-decision discourse)	pre-decision primary meta-framing of Paks expansion Oct - Dec 2013	post-decision primary meta-framing of Paks expansion Jan - March 2014	change in focus of framing	change in commu- nication intensity	sign of any political framing
government and government parties	a key element of the approved energy strategy and a necessity for energy security and for economic development	a must for the economic development of the country and a guarantee for political independence	partial	growth	yes
opposition parties	debated the need from energy, climate and economic perspective	a proof of misuse of political power	yes	growth	yes
environmental NGOs	contradicts European trends and supersedes renewables	not only contradicts European trends and supersedes renewables decision making, but exclusion of public reflects abuse of political power	partial	growth	yes
energy economics analysts	diverse, but primarily energy and climate	diverse, expanding also into economic and political aspects	partial	growth	yes
political analysts (new actors)	-	foreign policy aspects, loss or regain of independence	new	growth	yes
non-nuclear energy profession	an important element of the energy mix together with other sources of energy	an understandable decision, but made unnecessarily early and in an unexplained rush	yes	steady	no
nuclear energy profession	safe, clean and cost efficient solution for energy needs	safe, clean and cost efficient solution for energy needs	no	steady	no
scientific sphere	diverse	diverse	no	growth	no

Table 26: Changes in narratives following signing of nuclear cooperation agreement with Russia

#### 6.3. Analysis of immediate changes

Signing of the nuclear cooperation agreement brought considerable changes in the prevailing meta-framing of narratives. Of the 8 stakeholder groups, it brought a partial or total change of focus in the case of 5 of them, did not initiate such change in the case of 2 groups, and furthermore resulted in the creation of a new stakeholder group. It also contributed considerably to the change of intensity of communication: 6 groups intensified their public presence while 2 remained at their previous level of intensity.

In terms of direction of change it can be stated that the dominant energy-economics narrative has become fragmented and a more diverse approach prevails instead. In the post-decision framing, together with the energy and economics narratives, political narrative becomes an equally important interpretational structure. In fact, in the case of certain stakeholder groups, especially in connection with the timing and the form of decision-making, the political aspect becomes the dominant approach. In the case of 3 of the 8 stakeholder groups: the nuclear and the non-nuclear energy profession as well as the science actors, emergence of the political aspects cannot be observed. As noted before, the change in narratives did not all happen at once. The growing divergence in the perception of actual risks and benefit became noticeable as early as October 2013. In the period leading to the decision, the energy economics aspects also became apparent, to be joined with an increasing level of political connotations as well. The trend responds to the overall assessment that evaluation of the nuclear agenda requires a broad approach. Broadening of the approach carries three further consequences:

- 1. The concept of nuclear energy cannot be considered as a matter of energy policy only, but as an issue that is in close connection to the overall social - political structure of a given country.
- 2. The group of actors and stakeholders of the nuclear agenda cannot be limited to energy technicians and politicians, but needs to be extended to represent a broad range of stakeholders across the public to ensure representation of all possible stakeholders.
- 3. Finally, the issue cannot be described in the context of a linear model, but is a complex issue with multidimensional aspects, the needs of which systemic thinking serves better.

#### Shift in attitude of media

Compared to the pre-decision period, the intensification of media involvement can be noticed. Previously, the limited scope of narratives and the representation of the nuclear agenda as an issue for energy professionals created an *invisible glass ceiling* for the issue. Consequently, the topic did not extend beyond the specialized media and the particular sections, columns and programs. From the public perception the differences of approaches and narratives were not notable. Comparison of media coverage of the 2 periods indicate the following changes:

- significant increase of level of media intensity<sup>50</sup>

<sup>&</sup>lt;sup>50</sup> In fact, in the period mid January - mid February it becomes the leading political and economic topic in the Hungarian media

- involvement of a wide range of media, including presence in mainstream and tabloid as well
- diversification of media approaches, in terms of choice of dominant narratives
- emergence and visualization of contradicting argumentations within one media, in the form of series of articles, parallel interviews, representation of pro and contra arguments, as well as proliferation of publicist and opinion letter publications

Change in role of media reflects realization of two issues. First, the intensification of stakeholder group activities exercises direct or hidden pressure on the media to provide coverage for specific narratives. Second, the public expresses a growing interest in the issue of Paks expansion. The possible reason is that with the differentiation of narratives and the intensification of communication, members of the public become aware that the extended and expanded use of nuclear energy, as well as the conditions of the new project exercises an effect on their individual lives. Diversification of narratives also means they can more easily find a narrative to associate with, therefore identification or alienation towards the issue becomes more apparent. Through depicting the decision as a step that, for the next 50-70 years, will exercise a strong influence on the lives of people in Hungary, the media becomes a partner for a more complex thinking.

#### Emergence of new considerations

Beyond the changes in meta-framing as discussed above, new aspects have also emerged. The fact of having the extension of the nuclear cooperation agreement with Russia, and signing of the contract for the delivery of two new reactors with Rosatom, resulted in placing the Hungarian nuclear agenda into a pan-European context. First, the exclusion of any public bidding and the consequent elimination of possible involvement of French, US, Japanese, Chinese and Korean firms, granted a pan-European, international context to it.

Beyond the apparent disappointment, the way of decision-making and the content of the agreement has been put up to investigation of the European Union. While a pre-decision notice had been made to the EU, and the involvement of Euratom<sup>51</sup> in the preparatory phase was secured, still the active interference of the Competition Commissioner of the European Commission is expected. They would investigate the compliance of the agreement and the decision making with the relevant EU regulations. The growing presence of the European

<sup>&</sup>lt;sup>51</sup> The Euratom Treaty is an organization of the European Union to pool knowledge, infrastructure, and funding of nuclear energy. It ensures the security of atomic energy supply within the framework of a centralized monitoring system.

narrative can furthermore be assumed by the fact that the political argumentation for the need of capacity increase repeatedly refers to the export potential of electric energy into Western Europe. Raising this issue resulted in repeated discussions on the future of the energy balance of the European Union, and possibly keeps this aspect on the agenda.

A further significant aspect that offers ground to various interpretations is that of the conditions of an up to 10 billion euro loan that Russia extends to Hungary, detailed conditions of which are undisclosed to the public<sup>52</sup>. Finally, the European context is clearly explained by the complex relationship between members of the European Union and Russia. Especially in light of the Ukraine and Crimean crisis within a few weeks after the signing of the Paks expansion deal, repeated discussions prevail on the feasibility and the political rationality of such a long-term agreement. The risks and benefits analysis of the Paks expansion plans now need to be considerably broadened to include factors deriving of the involvement of Russia.

#### Emergence of new actors

name	stakeholder group	contribution to narrative
Gábor G. Fodor	political analyst	deal contributes to increased, long term independence
Zoltán Sz. Bíró	political analyst	involvement of Russia increases number and complexity of risk factors
János Ősz	energetics professor	lack of transparent bidding and choice of outdated reactor model reduces potential efficiency of NPP
owners of Manitu Solar, PV systems company	non-nuclear energy professionals	the deal results in unfair spraying of costs and risks across the whole population, instead of individual energy development projects
Zoltán Hózer, president, Magyar Nukleáris Társaság (Hungarian Nuclear Society)	nuclear energy professionals	welcomes the deal, urges steps in nuclear education and training, and identifies political influence as risks, that could endanger professionally grounded decision making
Pál Zarándi, Magyar Mérnöki Kamara (Hungarian Chamber of Engineers)	engineers	support to deal and identification of opportunities for Hungarian engineers to join in the project
HYPE - Hungarian Young Professionals in Energy	energy professionals	decision shows that alternatives have not been considered carefully, while conditions of decision making contribute to the confusion within the lay as well as the professional public about the validity and the soundness of the decision

Table 27: Selected new contributors and contributions to the nuclear discourse

<sup>&</sup>lt;sup>52</sup> Reference of details of loan conditions were made on the website of the Russian Parliament, as quoted by Hungarian news site Index, 13 March, 2014, available at: http://index.hu/gazdasag/energia/2014/03/13/az oroszok jovahagytak a paksi hitelt/, accessed 4 April, 2014

Following the decision, a number of actors emerged who had practically not been present in the pre-decision period (Table 27). Some of them appear in stakeholder groups were not active at all, while others represent groups that were already on the scene, but interpretational differences emerged within the group and resulted in diversification of the discourse.

#### Intensification of coalition building

Support to narratives and increase of credibility is hammered through by coalition building and by third-party endorsement. It can be observed that protagonists of key narratives reinforce efficiency of communication narratives and of the desired framing by building coalitions. Coalitions have the advantage to support the given narrative of the issue by:

- adding credibility
- enrichment of the narrative
- representing and involving the interest of various groups of the public
- decreasing power of direct criticism

#### Initiative for building scientific discourse

The Hungarian Academy of Sciences initiated and hosted an event<sup>53</sup> where scientists and professionals presented their views on various aspects of nuclear energy. The event was organized in 2 main sections: technical, economic and international contexts in one section and alternatives, energy sources and security issues in the other one. The event was the first of its kind to provide the floor in equal numbers to protagonists and opponents of the Paks deal and the nuclear agenda. The event proved to be the first, and by the time of 31 March, the only forum where confronting views were presented in a systematic manner. The forum itself did not offer chance for questions and comments from the audience but, through the presentations and the interaction between the presenters, showed a significant initiative for stimulating public discourse. The significance of a scientific approach is apparent, however its exact role needs to be pursued further.

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<sup>&</sup>lt;sup>53</sup> 'Electric energy supply in Hungary in the 21 century', 18 February 2014, presentations of the conference can be downloaded from: <a href="http://mta.hu/mta-hirei/tudomanyosan-megalapozott-ervekkel-az-atomenergiarol-133574/">http://mta.hu/mta-hirei/tudomanyosan-megalapozott-ervekkel-az-atomenergiarol-133574/</a>

#### Missing narratives

In the intensified and, in some cases, emotionally heated discourse, the lack of involvement of Paks 2, the project firm of the actual nuclear development program, and MVM Hungarian Electricity Ltd., the state-owned mother company of Paks 2, is apparent. First hand information from the top executives of these companies is non-existent, all signs indicate a subordinate role in the actual execution of the project, to the Russian general contractor on the one had and to the Hungarian government, on the other hand. Furthermore, as by 31 March 2014, Paks 2 is still not present in the virtual world and does not have a public website at all. The only information available about the project firm is a one page information on the MVM website, containing the basic facts of the company, similarly to all the daughter companies of MVM, as well as a Facebook page that comprises lists of which municipalities the informational truck is visiting next. Information about the company, the project and any background material on the decision is unavailable. Non-communication being a form of communication, the situation raises challenges in terms of transparency of and trust towards the nuclear development program.

### Publication of new opinion polls

Two pieces of public research were published within 3 weeks after the decision on Paks expansion<sup>54</sup> (Table 28). The motives for creating the polls and their timing show considerable similarity, however the findings of the 2 polls differ significantly.

Through the potential support to a variety of narratives, opinion polls can easily become tools for communication, or, possibly, for manipulation. As discussed before, a range of factors can add to or deduct of the credibility of opinion polls. Analysis of the findings reflect the double function of opinion polls: they serve as a prime tool to understand and interpret the social environment as well as being challenged by becoming tools to support different narratives.

Notably however, the core findings of the two pieces of research do not necessarily contrast each other. A general, though not very strong support to Paks expansion easily turns into rejection, once the nature of Russian involvement is brought to the picture.<sup>55</sup> In spite of

<sup>&</sup>lt;sup>54</sup> http://nezopontintezet.hu/aktualis/paks-nem-jo-tema-az-ellenzeknek/, accessed 17 February, 2014 and http://www.median.hu/object.57f2f4fe-d1cd-4a70-9496-3b4de41e3126.ivy, accessed 17 February, 2014

<sup>&</sup>lt;sup>55</sup> One of the newspaper headlines sums this up by claiming: 'People nod to Paks expansion but can not stand thought of Russian loan', ("Az emberek a paksi bővítést igenlik, az orosz hitelt rühellik"), Népszava, 3 February,

key aspects	Nézőpont Institute	Medián
date of publication	1 February, 2014	3 February, 2014
focus of research	- Paks expansion - Russian - Hungarian economic cooperation	- Paks expansion - attitude to form of decision making
key findings	Paks expansion support: 52%, oppose: 25%, NR: 23%	Paks expansion by Russian company and with Russian loan support: 34%, oppose: 56%, NR:
	Paks deal brings rather advantageous or disadvantageous:	10%
	adv: 42%, disadv: 23%, NR: 35%	surprised by news of signing Paks deal
	tighten Russian-Hungarian cooperation support: 55%, oppose 9%, keep: 22%, NR:	agree: 78%, disagree: 20%, NR: 2%
	14%	holding referendum on the issue: support: 59%, oppose: 36%, NR: 5%
headline of press release	Paks: not good topic for opposition (Paks nem jó téma az ellenzéknek)	Paks expansion: serious concerns (Paks bővítés: súlyos fenntartások)
methodology	20-25 January, 1000 pollees, telephone interviews	24-28 January, 1200 pollees, personal interviews
commissioner of poll	not clarified	not clarified
general framing	Paks expansion and strengthening ties with Russia bear the support of the majority of the population, therefore a possible political meta- framing is futile.	The content of the decision is controversial, the form of decision making is unacceptable: a referendum is needed to decide on this issue

Table 28: Comparison of 2 public polls of February 2014

compatibility of findings, the results serve as support materials for the emphasis of broader narratives. This is constructed by placing the issue into a broader, and preferred context or framing, and obtaining support to the narrative from the findings of the actual poll. Consequently the findings become tools for the reinforcement of credibility of different narratives.

#### Membership suspensions in the Aarhus roundtable

The 4th meeting of the Aarhus roundtable took place the 20th February, in the aftermath of the signing of the nuclear agreement. The focus topic of the meeting was to acquire information about the nuclear cooperation agreement and about the Paks development plans, from representatives of the government and the licensee sides. A presentation was delivered by the general manager of MVM Paks2 on the project plans related to the 2 new reactors, followed by an intense question and answer session. Members of the government and authorities side did not add further information, referring to the fact that MVM Paks2 is the entity in charge of the development plan. At the end of the session, most NGO members of the roundtable. announced suspension of membership and participation in the working group and the roundtable, due to the unsatisfactory information regarding the Paks deal and lack of general progress at the roundtable. At the same time, an informal reference was made, that due to the impossibility of the Aarhus process, NGO members will continue seeking new channels, to obtain information and to exercise public pressure on nuclear-related decision making and execution of development plans.

#### 6.4. Strategic consequences to the nuclear discourse

#### Diversification within stakeholder groups

Signing of the agreement resulted in the emergence of new actors on the scene. This resulted in the diversification and of opinions within the stakeholder groups. Diversification of opinions has been generated by the influx of a range of new factors comprising the actual issue. In a number of areas, differences in opinions and complexity of open questions reflect the lack of detailed information. Information holes and differences in interpretations lead to differentiation of narratives. Stakeholder groups that have previously been characterized by shared or even standardized opinions now show signs of fragmentation. Complexity of issue raises a list of aspects up for potential discussions:

- the content of the decision
- the actual content of the agreement

<sup>&</sup>lt;sup>56</sup> Greenpeace, MTVSZ, Energiaklub and EMLA

- timing of the decision
- validity of the agreement
- preparedness of the agreement
- purpose of the agreement
- political consequences of the agreement
- economic and financial consequences of the agreement
- consequences of the agreement on taxpayer commitments
- relation between contract and energy prices
- risks and benefits of the agreement

Apparently the only aspect where agreement exists is that an agreement has been signed between Hungary and Russia, and a contract signed between Rosatom and the Hungarian Minister for National Development.

#### Potential erosion of political credibility

Longitudinal analysis of the narratives of political parties reflects significant changes in their Paks narratives. Most of these cases build on the usual phenomena, where parties in opposition tend to say and act differently then once being in power. In a system where major political parties regularly swap positions in elections, this induces swapping narratives and views on nuclear energy as well. In the current case significant changes in narratives can be identified in relation to the following aspects:

Paks expansion needs referendum dealing with Russia is dangerous nuclear energy increases dependence the issue is expanding Paks NPP absolute need for international bidding vs. Paks expansion needs parliamentary decision vs. dealing with Russia is an economic necessity vs. nuclear energy increases independence vs. the issue is maintaining Paks NPP capacity vs. no need for international bidding

Changes in narratives and continued public support to the parties performing these changes represent two factors. First, the public apparently accepts the fact that political parties tend to modify their views. As long as these are in line with the general value system and beliefs of the given individual, their support is ensured. Second, identification with the overall meta-framing is critical. As long as the narratives fit into the overall political meta-framing, be it independence, stability, or European values, actual steps will not cause loss of credibility

from their own electorate. Consequently, even radical changes in views on nuclear energy, in spite of risking political credibility, will not reduce overall loyalty as long as the meta-framing is accepted. This implies success of utilitarian politics and of efficient communications.

#### Growing acceptance of constructed realities

Changes in narratives could potentially generate a cognitive dissonance in the public. Certain fundamental elements of the nuclear agenda have changed, causing conflicts in the conditioning of the audience. As the issue of nuclear energy still remains complex, and proves difficult to understand, conflicting narratives result in an obligation to choose. Choice is then made based on the assumption of trust and credibility. As the issue becomes more and more of a political issue, members of the public are ready to give up or change their assumption or feelings about nuclear energy, but much less ready to make compromise on their political choices, as these are reflections of basic values and beliefs. Constructed realities not only continue to prevail, but are even strengthened further.

#### Paks becomes an emotional issue

Becoming a symbolic issue implies that members of the public build strong emotional ties, supportive or critical, to the nuclear agenda. The elements of emotional attachment or alienation induce that Paks and the issue of nuclear energy is not any more a distant concept, but it becomes the clear and understandable symbol of a given action. Not only does it arrive in the political sphere, but it becomes a meta-symbol, therefore it can be turned into the representation of an actual period or way of thinking. As described earlier, referring to the case of the Netherlands, emotional attachment is in strong correlation with the value systems of the given individual, and the combination of the two can lead to strong expressions of opinions. Consequently, this can lead then to a more powerful representation of individual opinions and become an issue for the public sphere.

#### Conflict between energy independence and political independence

A further discussion is foreseen for the future around the issue of independence. One of the key narratives for the deal has been the issue of energy self-reliance and increase of energy independence. Expansion of nuclear energy capacity is explained by loosening the ties from

imported gas, the source of which is primarily Russia. Electricity of nuclear power is generated within the country borders, and is not considered a form of imported energy, even if the technology and the fuel can only be supplied from abroad. The price of energy independence seems to be political dependence on the supplier of the technology and the fuel. The concepts of energy independence and political independence seem mutually exclusive and therefore represent contradictory philosophies.

#### Emergence of a new meta-framing: Europe

The signing of the Hungarian - Russian nuclear agreement induced the development of a new meta-framing: the issue of the European context. The complex world of energy is not a national issue anyway, however the agreement signed directly with Russia underlined its international dimension and consequences. The discussion on the nuclear deal includes a strong relevance with a discussion about Europe, in terms of its role, power, future, energy needs and supplies. Discussions continue on two levels. On the broader level they concern the general value system and role of Europe and the European Union within that. On a more detailed level, among others, they concern the actual discussions with the EC Competition Commissioner's Office, the potential implications of the conflict between Russia and Ukraine and the projected export potential of surplus electricity to the European Union. The way and timing of the signing of the Paks nuclear deal induced it to become a European issue.

#### 6.5. The need for a new conceptual framework

The analysis of the discourse proves that discourse is most commonly driven by actual stakeholder interests, and that scope of the current framework and structure of discourse is limited. The following analysis pursues the structure of layers covered in the previous chapters: parliamentary-political, professional and media discourses as well as reflects on the role of opinion polls, and assesses the situation from the perspective of the development of the public sphere.

Actors of parliamentary debates are driven by the interest to articulate a clear position to win, keep and grow their electorate. Ownership of issues and the ability to govern the prevailing narrative is a representation of drive for power. In the period following the signing of the nuclear cooperation agreement, political actors shifted or even changed their narratives,

previous positions became blurred and intensification of communication is noted. Perceived interests clash with inherent value systems and cause volatility to political discourses.

Professional discussions reflect the interests of the actors with the primary purpose to overcome the considerable imbalances in access to information. Following the signing of the nuclear agreement with Russia, lack of access to relevant information resulted in the radicalization of opponents to the agreement. Discourses not only highlighted the emergence of conflicts due to differences in access to information but, in the case of a number of members opposing the agreement, resulted in the voluntary suspension of participation in the work of the Aarhus roundtable. The future of professional discourse is unclear.

Media discourses often echo the views of politicians and, consequently, align with parliamentary discussions. In the period January - March 2014 changes in media narratives reflect diversification, appearance of differing and conflicting views and an in-depth analysis of the nuclear issue. Intensification of media narratives provides a reflection of the complexity of the possible approaches. The major difference between media narratives seems to be whether primarily political or economic motives originated the move of the Hungarian government. It is foreseeable however that the primary media interest in the issue wanes and pursuing developments in the field will rest on political intentions.

Opinion polls are trapped in a contradictory situation: their dual role requires delivery of support to actual communication activities, while they furthermore become channels of communication. Dual nature of polls is best shown by the fact that selected pieces of information from actual pieces of research are shared, while other aspects are withheld, increasing therefore the risk of potential manipulation or misuse of information. Following the nuclear deal, parallel opinion polls with differing findings confirm previous manifestations of becoming opinionated and reinforce utilitarian use of research findings.

Subsequently, significant changes took place in the public discourse on nuclear energy in Hungary following signing of the nuclear agreement. In all layers of discourse, patterns and intensity of communication changed. On the one hand, stakeholder communication intensified and became differentiated. In terms of tone, narratives turned direct and critical aspects became visible. On the other hand, intensification and diversification of the discourse does not seem to have any impact on the actual developments. Changes in narratives resonate with the European observations. In most of the European countries over a period of years, shifts of

positions, changes in narratives and changes in intensity level of communication are notable. Often these changes are triggered by external developments, such as nuclear accidents, breakdowns or decisions of other countries or are results of internal shifts in power.

Reason of shift of narratives derives of the complex nature of the subject. In the case of a multi-faceted issue like nuclear energy, individual narratives are always dominated by emphasizing selected characteristics, features, benefits or risks. Preference of certain aspects leads to omission of others. However, as political, professional or media interests change, added with changes in the fields of science and technology, natural and social environment, philosophy and ethics, new dimensions of the nuclear issue gain growing interest. This may lead to a constant change in positions. The January 2014 developments contributed to the intensification and diversification of the discourse. Development of the discourse would comply with the concept, where the public sphere is a forum of public communication of individual citizens (McKenna, 1995). This development, in other terms, could be described as the emergence of a higher quality discourse. However, the public discourse on the need and use of nuclear energy takes place after a decisive political action has been made and not before. In this respect the public discourse does not exercise a direct effect on the outcome of events, even if in an ideal situation, that would be its actual purpose. If ensured, intensification of the public deliberation could contribute to the development of a stronger democracy (Barber, 1984, Dahlberg 2004).

Introduction of a new narrative framework could exercise a change in the ongoing flow of changing narratives and contribute to the restructuring of the discourse. A new setting could lead to the reinterpretation of actors, narratives and issues. In more general terms, this could lead to the development of a new model of public participation in the discourse, decision preparation and decision-making on nuclear energy.

#### 6.6. The democratization of nuclear energy

As discussed in previous chapters, *nuclear energy is often a symbol of power*. Use of nuclear power represents a strong country that is able to master and rule the 'wild energies' of nature. Exploration of nuclear capacities and operating NPPs require concentrated resources of intellectual power, building capacities, adaptation of scientific, technical and technological innovations, securing of financial constructions and of security systems. All this is entailed to the extent where they cannot be delivered without the active involvement of the state. In the

case of smaller economies, the development of nuclear capacity is clearly a state responsibility. Even in the case of large market economies, NPPs cannot be planned, installed, operated and controlled without the actual involvement of the state. Furthermore, transmission of electricity from nuclear power plants to the consumers require large centralized systems, where power lines transfer centrally produced energy to the peripheries, all of which implies the involvement of the state again. Nuclear related safety requirements are essential and demand utmost drill and discipline: rules governing everyday work in and related to the NPPs must be followed closely.

Ownership of *nuclear related knowledge and excess to information is considered a privilege*. Perception of nuclear energy is that it has the ability to solve all, seemingly contradictory issues at the same time. For the public, access to information is limited, based on the notion, that the responsibility of dealing with nuclear energy is trusted on the experts.

However, a different narrative could be constructed. In this approach, of all forms of energy nuclear power is the one that has the biggest impact on the individual members of the public, as well as on the whole community. All the resources that are centralized for the exploration of nuclear energy are in the end owned by - or at least drawn from - the community. From the perspective of the community, *opting for nuclear energy is a compromise, if not a sacrifice from the community*. Financial needs of the establishment of an NPP mean preference over the fulfillment of other needs of the society. A society-based approach to nuclear energy is strengthened further by the recognition that consideration of nuclear energy cannot be limited to the issues of energy supply and technology aspects only. Due to the multitude and complexity of aspects it is better represented as a system of socio-economic nature. Members of the society are not simply consumers of energy, but are members of the society with their vision, aspiration, needs for security and safety, as well as material and intellectual needs. From this perspective, nuclear energy is a choice in which opinion of the members of the public is not necessarily reflected.

Finally, the nuclear issue is an issue for all, due to the related risk factors. Previous nuclear breakdowns and accidents as well as the unsolved issue of handling nuclear waste, geographically extend the risk scope on the one hand and push responsibility to the following generations on the other hand. The nuclear option is not just an option but is the option that bears numerous consequences for all members of society. Consequently, benefits and risks need to be weighed from the perspective of the full public. It is claimed that public acceptance

or refusal of nuclear power is not a matter of persuasion (Otway et al, 1978), consequently, one way communication channels may prove futile. Attitude formation is not a rational process and it requires methods different than information and argumentation.

All these lead to the conclusion that strong arguments could be raised for the need of democratization of nuclear energy. This approach would challenge the current narrative of nuclear energy as a symbol of dominance of power, centralization, rules and state involvement. To reestablish a balance between those with access to information and those that have none, the new model would include significant shifts: information sharing instead of monopolization of information, and inclusion of all stakeholders instead of an exclusionary approach (Sarlós, 2014). In order to gain trust in large-scale public projects, the criteria of openness of decision-making processes, maintenance of fair partner relations and involvement in decision making are listed (Vári, 2009).

Democratization of nuclear energy needs to start with *democratization of the nuclear discourse*. Public participation in processes might contribute to the levels of social trust, most important of which is trust in the government (Mulder, 2012). The concept of democratization of nuclear energy is described in the following segments:

- political philosophical context
- elements of decision making in a public participation model
- elements of communication in a public participation model

Within the analysis of the social dimensions of nuclear energy, first the possible contextual interpretation of nuclear energy development needs to be addressed from a political philosophical dimension, and to this end the possible adaptation of a communitarian approach is pursued. Seemingly, the use and development of nuclear energy and the principles of communitarian principles are not reconcilable. An attempt is made to give an insight into how the various criteria of communitarian principles could prevail in the planning of nuclear power development and during the use of this source of energy.<sup>57</sup>

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<sup>&</sup>lt;sup>57</sup> The elaboration of the communitarian approach to nuclear energy is based on a research paper: Gábor Sarlós: Ecology and Nuclear Energy, presented 28 May 2013. The paper was developed to study possible adaptability of communitarian principles with adoption of nuclear power. The study builds on the premises of communitarian principles, as elaborated in detail by András Lányi and discussed among others, in: Lányi, A. (2012) 'Az ökológia, mint politikai filozófia', *Politikatudományi Szemle*, vol. 21. no. 1. pp. 105–132.

Within the field of political theory, ecology is interpreted as a complex system of communitarian endeavors. The characteristics of communitarianism are usually hidden behind the dominant triangular classification of conservative, liberal and social philosophies.

Ecology is strongly determined by the principles of communitarianism. It seems that of the group of mainstream political philosophies, this is the only one that systematically embraces the criteria of ecology. Four key criteria define communitarian principles (Lányi, 2012): self-determination of communities, localization, equal participation and recognition of the right scales. The following analysis examines to what extent these considerations are taken into account during the nuclear related decision-making process. Findings could provide indication to what extent the aspects of communitarian philosophy are taken into account during the decisions, and if the nuclear issue could be assessed on a communitarian basis.

## 6.7. Nuclear energy from a communitarian perspective

#### Self-determination

In order to speak about self-determination, the size and extent of the public needs to be determined first. Both legal and practical definitions define 3 circles of affected communities. First, in practical terms, the community most directly affected consists of the people that live in the immediate neighborhood, and bear the most direct consequences of the operations of an NPP. Local communities are affected both by the risks and the benefits of such a nuclear project. Research shows that local communities are aware of both the high risks and benefits of NPPs in the vicinity (Venables et al, 2012). Risks comprise direct and closest exposure to possible contamination, radiation, increased traffic and industrial activities. Benefits usually comprise increased job opportunities, involvement of local businesses in supplementary activities, partnership with local institutions, support to cultural, educational, sport initiatives, access to and positive affects of developed technology. Typically, communities that actually give location to existing NPPs are the biggest supporters of nuclear installments, while those communities that are located just outside of the closest vicinity consider that they have been recipients of increased risks only, and do not receive their fair share of increased benefits. Consequently the latter are among the strongest opponents of such projects. In a number of cases, municipal veto or local referendums reject establishment of a new NPP or a nuclear waste disposal facility in a new location (Finland, Sweden, Poland). Diverse practices exist regarding requirements for seeking agreement of municipalities. In certain countries (for example Belgium) the municipality has no power of veto, in others (for instance France) it may veto or a local referendum may oppose to the project but their decision is not mandatory. In a third group of countries, like Finland for example, the municipality has the right to refuse hosting the project and veto the decision.

In case of Paks, neither in relation to the original establishment in the 1960-1970, nor in connection with later expansions and life cycle extensions has the issue of referendum, be it local or national, emerged. During the last years however, political discourse related to the current expansion of the Paks NPP did raise the issue. Nevertheless these initiatives always represented the demand or promise of opposition parties, and were never shared by those actually in government. Important to note that in the 1980s in relation to the foreseen filling up of the Püspökszilágy nuclear waste depot, a number of options for locations of new sites were investigated. In a local referendum in 1990, the population of one of the communities, Ófalu, declared that it was not willing to host the planned nuclear waste depot. The refusal resulted in a further expansion of the existing Püspökszilágy site, and the identification of a new disposal site for temporary storage of Low and Intermediate Level Waste (LILW) at Bátaapáti. The local referendum in this village expressed strong support to the establishment of the storage facility.

The population of a given country forms the second circle of the affected community. Countries have the right to decide on the establishment of nuclear power plants and installations. As described in detail in the European context, expansion decisions are usually made through government decisions and backed by parliamentary resolutions, while in certain cases national referendums also play a significant role. National level decision-making reflects a concept of sharing the risks and benefits across the full country and with the entire population, where every member of the national community faces both the benefits and the risks of nuclear programs.

In legal terms, the international community forms an even wider circle. Effects of use of nuclear energy are trans-boundary, as the potential risks of the operations affect communities living beyond the borders of the given country. This is the reason why principles and proceedings of international involvement are described in the UN's EGB agreement ('Espoo agreement') and the relevant European Parliament and European Council directives<sup>58</sup>.

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<sup>&</sup>lt;sup>58</sup> Az egyes köz- és magánprojektek környezetre gyakorolt hatásainak vizsgálatáról szóló 2011/92/EU európai parlamenti és a tanács irányelv (KHV irányelv)

In summary, the issue of community self-determination in relation to the use of nuclear energy could be interpreted on a local level, a national level or a trans-boundary level. Community self-determination would mean that the community as a political entity is granted the possibility to decide on this issue, unrestricted of external pressures. This aspect is closely related to the issue of participation and of sharing and distribution of responsibilities. In representative democracies, participation of the community in actual decision-making is limited. In fact it is argued that actual participation is not possible, as members of community neither have the possibility, nor the interest to obtain all the relevant information for informed decision-making. Actual participation is consigned to the elections, where members of the community have the possibility to make decisions on who their actual representatives in decision-making should be. It may be argued therefore that, be it on local or national level, referendums are not elements of communitarian self-determination, but are forms of participative decision-making.

Nevertheless for the ease of analysis, referendums on planned extension of nuclear power capacities can be signals of community self-determination. In the case of the planned extension of the Paks NPP no referendum is foreseen. Self-determination in the context of the extension of the Paks NPP does not prevail. Indirectly, through expressions of will through representatives, members of the community in Hungary approved the preparatory steps for the elaboration of an extension in 2009, which was later interpreted by the actual government as an approval for the extension project as such. What can be recorded is that the expansion plans enjoy the support of the majority of the members of parliament<sup>59</sup>.

#### Localization

The prerequisite of localization means the reestablishment of the human scale. This aspect includes correspondence to the policies of responsibility, providence and ecological alertness, and form important criteria for the communitarian assessment of nuclear energy. Decisions are to be made on the level where their consequences prevail. The contextual frame can be interpreted both on a local and a national level, and would include examination of how the structure of actual decision-making is done and includes the criteria of localization. In a symbolic sense, of all forms of energy production, the distance between nuclear energy

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<sup>&</sup>lt;sup>59</sup> This remains the case following the parliamentary elections the 6 April, 2014 where the ruling parties won the elections and were confirmed in their position.

production and the members of the public is the largest. Electricity production and transmission from a NPP require highly centralized systems, and consequently become symbols of central energy production and radial distribution of energy. This model is in significant contrast to grid-based solutions, where energy production, mainly built on renewable energies, is localized, and energy supply is provided and balanced through a grid network. This network allows overcoming differences in production and usage inequalities. Decentralized energy production and grid based sharing of energy are symbols of localization, while nuclear energy related decision-making and electricity production represent a centralized model.

In terms of environmental effects represented by the policies of responsibility and sparing, nuclear energy leaves a mixed footprint. On the one hand, the full process of nuclear energy involves elements of significant environmental risk. Uranium mining, transport of radioactive fuel, actual energy production, transport, storage and reprocessing of contaminated nuclear material and fuel rods include a number of critical elements. While these risks prevail on an ongoing basis, major nuclear accidents and catastrophes (Three Mile Island 1979, Chernobyl 1986, Fukushima 2011) together with smaller accidents and breakdowns (Paks 2003) represent significant individual points of danger. On the other hand, nuclear energy production has a practically zero level CO2 emission and subsequently offers an important alternative to fossil based energy sources. In the stage when use of coal, oil and gas is a major contributor of increased CO2 levels, and the limitation and reduction of greenhouse gas emissions is essential, nuclear energy offers an environment friendly alternative.

#### Equal participation

The issue of equal participation is in close connection with that of self-determination. Stakeholders tend to take an active participatory role, if they see chances for having an influence on issues direct affecting them. Community participation makes sense, if it is not meant for the *posteriori* legitimation of an existing measure, but is an *a priori* act that can exercise significant influence on the outcome of decisions. In the case of the expansion of the Paks NPP those stakeholders have the right to take part in the procedures that are specifically spelled out in the law. Recent developments in the nuclear field, including the signing of the nuclear cooperation agreement and start of preparation of the expansion project, prove that the scope for action is very limited for gaining access to information and involvement in decision making. In legal terms, in case of investments with significant environmental impact, affected

actors need to register. Once the relevant authorities approve the right of standing of the given actors, the possibility for equal participation is created, however in practical terms strong limitations are set in terms of number of actors and content of participation.

Involvement of actors is possible through market and societal elements. Examples of Hungary related to establishment of nuclear waste sites prove that involvement of local communities is based on market methods: communication and compensation (Vári, 2009). In most cases, emphasis of benefits and providing of compensation secured the agreement of the local population. The buy-in through buyout method implicates that transparent and active involvement in multiple points of decision-making is not present.<sup>60</sup>

#### Recognition of the right scale

Ecological considerations put recognition of the right scale in the focus, in contrast to the perception of abundance of resources. Communitarian views identify that idealizing quantitative performance leads to excessive use of resources, while supremacy of the efficacy concept leads to focusing and centralizing resources. Argumentation for nuclear power production and the planned extension of the Paks NPP derives necessity of extension from the need of increased energy supplies. A report compiled for the Hungarian government by MVM Hungarian Electricity Ltd. explains that 'primarily for the obsolescence of the Hungarian power generating capacity and second, for the increase in customer demand - even within the temporary setback of economic crisis - 5000 MW of new production capacity needs to be installed by 2020 and further 4000 MW of new capacities are needed by 2013<sup>161</sup>. Argumentation for the investment is explicitly based on figures related to performance. The document lacks any reference to argumentation that would refer to factors beyond the performance focused economic-energy framing. Actual content and validity of document cannot be argued, but it gives indication to the absence of a more general, prudent and sophisticated approach. The approach reflects the lack of ecological considerations and of a more general, social based approach of the issue. Opponents to the current expansion raise issues with emphasis on the recognition of the right scale, referring to surplus energy available through energy saving, incentives to exploration, production and use of energy of renewables sources, support to community based energy production, energy optimization

<sup>&</sup>lt;sup>60</sup> Signs indicate that this practice is followed in the case of the current Paks expansion as well. Almost 2 years after its official establishment, in July 2012, MVM Paks 2 Zrt., the project company designed for the development and the construction of the new blocks does still not have a web site, but the company decided to spend 550 million HUF (appr. euro 1,8 million) on buying media space in the first 6 months of the year alone. 61 61 http://www.kormany.hu/download/4/83/c0000/ekd\_20121026.pdf, introduction, paragraph 2

through the development of grid based sharing of energy, and existing oversupply of energy in Hungary and in Europe in general. All these meet the criteria of enforcing the right scale and the respect to diversity.

In conclusion, the use and the development of nuclear energy capacity has been analyzed through 4 critical aspects of communitarianism. The analysis indicates that nuclear energy does not meet the criteria of equal participation and recognition of the right scale, while 2 further criteria are met only partially. Certain elements of self-determination and of localization, including ecological alertness, seem compatible with nuclear energy. However, in overall terms nuclear energy currently does not match criteria of ecological policies. Adaptation of a communitarian approach could facilitate understanding and possibly acceptance and identification with the issue of nuclear energy.

## 6.8. Adaptation of principles of participatory democracy

Challenging the notion that nuclear energy is the exclusive form of power generation could be achieved through breaking the barriers of exclusivity. This could be done through widening the range of stakeholders that have access to information, and allowing that, beyond access to information, involvement in decision-making is also granted. Democratization of nuclear energy and inclusion of elements of participatory democracy would fall in line with the communitarian approach described before. Development of new elements includes innovative methods of information sharing, empowerment of publics in decision preparation and remodeling of decision making. Adaptation of principles and practice of participatory democracy could facilitate development of a new approach to nuclear energy. Being a source of energy that spreads risk and benefits across the full population, rights to and responsibility of decision-making needs to be shared by everyone. It is argued that decisions by experts and elected representatives, together with expressions of opinions through referendums, provide ample opportunities for the involvement of the public. This claim should be challenged however. In spite of their name, referendums have limited scope and validity. Outcome of referendums are often reflections of imbalances in power and in access to information. Only in exceptional cases, such as in the aftermath of a nuclear accident, do decisions override these imbalances. Alternative ways of achieving informed and involved decision-making needs to be sought to overcome differences in access to resources.

Need for *democratization of nuclear energy* is in line with our claim: the nuclear issue cannot be approached and limited to the technological, economic and energy aspects. NPPs are integrated into complex social systems; therefore the issue needs to be treated from a complex socio-economic perspective, where the interests of all current and future stakeholders are considered. Adaptation of a 360-degree approach is proposed where all consequences of the nuclear option are weighed.

#### 6.9. Adoption of elements of deliberative democracy

Logic and reason, together with the consideration of a multitude of aspects, could be secured through a deliberative process. Before decisions are made, careful weighing of all options, and expressions of opinions and interests should take place. Potentially not only better-informed decisions are made, but the empowerment contributes to buy-in from members of the public. It is claimed that adaptation of elements of deliberative democracy would contribute to the understanding, improved opinion forming and decision making on nuclear issues. Adaptation and use of elements require dedication, as experience reveals a range of related problems.

#### Deliberative opinion polls

Deliberative opinion polls are important tools to overcome key problems with traditional polling: forming opinion while lacking information and with limited ability to record detailed opinions. Deliberative opinion polls that would include dissemination of information, discussions, and then grounded forming of opinion could add quality to all dimensions of opinion polls. However, it is claimed that key methodological issues are still not solved, therefore use of this technique is still considered problematic (Price and Neijens, 1998).

#### Consensus conferences

Consensus conferences are institutions created to involve public judgment in decision-making, in relation to issues with strong social and environmental aspects. Involvement through understanding complex issues with the inclusion of often contradicting pieces of information support informed decision-making. As a backside, they 'in most cases have fallen short or even produced results that are counterproductive to the notion of a productive public debate' (Scheufele, 2011:2).

#### Citizens' councils

Creation of a series of citizens' councils can contribute to the formation of a network of informed and involved members of the public. Participants in each council represent the composition of the given locality. The process itself is similar to that of consensus conferences, and the challenges in terms of their efficacy and outcome also carries signs of similarity.

#### Intermediary bodies

Fundamental differences in opinions and in access to information can be diminished through the involvement of intermediary bodies. Mediation serves the facilitation of the process and representation of all interests.

All these elements need to have the concept of balance in focus. 'Meetings should be part of the larger discourse to lead to an enhanced quality of the decisions. In that framework, they should focus on receiving input from the public and not be used as a propaganda tool for the project.' (Haverkamp, 2013)

#### 6.10. Introduction of alternative methods of decision making

Democratization of nuclear energy would also require changing traditional decision-making models. Characteristics of nuclear energy imply a series of steps of central and definitive decision-making. As nuclear energy itself is a symbol of power, related management and operational steps are also expected to be powerful. Alternative methods of should build on segmentation and diversification of arriving at decisions (Vári, 2009).

- 1. Optimization of decision-making would allow consideration of all possible factors. Decisions themselves would not be driven by the energy economy agenda, but facilitate equal consideration of all relevant factors.
- 2. The policy of small decisions accommodates the acknowledgment that in the case of a complex issue, a decision-by-decision approach is more compatible with the constant changes

in the environment. Combined with the inclusion of a multitude of factors, this prudent approach reduces the risks of erroneous decision-making. As totality is not accepted during the process, compromises become acceptable and turn into valued elements of the process.

3. Observance of the communitarian principles could be further supported through the maximization of the consideration of local opinions. The politically originated principle of 'Nothing About Us Without Us' has a valid meaning in the case of nuclear development projects as well.

In conclusion, consideration and adaptation of elements of democratization of nuclear energy would generate *decisions based on discussions*, instead of decision-based discussions. Presence and *involvement of all stakeholders* needs to equilibrate inadequacy in access to information. Involvement of important segments of stakeholders, facilitation of *grounded decision-making*, and *empowerment of the public* could all be managed through the creation of *digital platforms for nuclear communication*. The advanced use of internet in combination with adaptation of elements of e-democracy could lead to a higher quality discourse on nuclear energy and to the *democratization of the nuclear agenda*.

#### BIBLIOGRAPHY

- Anderson, B. (1983) *Imagined Communities: Reflections on the Origin and Spread of Nationalism*, London: Verso.
- Antal, A. (2013) *Zsák a foltját*. (Online) Idea Intézet, 7 May. (accessed 17 May, 2013). Available from: <a href="http://ideaintezet.blog.hu/2013/05/07/zsak">http://ideaintezet.blog.hu/2013/05/07/zsak</a> a foltját 851
- Babbie, E. (2007) The Practice of Social Research, Belmont, CA: Wadsworth.
- Baker, P., Gabrielatos, C., Khosravnik, M., Kryzanowski, M., McEnery T. and Wodak, R. (2008) 'A Useful Methodological Synergy: Combining Critical Discourse Analysis and Corpus Linguistics to Examine Discourses of Refugees and Asylum Seekers in the UK Press', *Discourse and Society*, vol. 19, no. 3, pp. 273-306.
- Barber R. B. (1984) *Strong Democracy: Participatory Politics for a New Age*, Berkeley: University of California Press.
- Bastide, S., Moatti, J.P., Pages, J.P. and Fagnani, F. (1989) 'Risk Perception and Social Acceptability of Technologies: The French Case', *Risk Analysis*, vol. 9. no. 2. pp. 215-224.
- Bauer, M. (ed.) (1995) Resistance to new technology: nuclear power, information technology and biotechnology. Cambridge, UK: Cambridge University Press.
- Beck, U. (1992) Risk Society: Towards a New Modernity, London: Sage.
- Beck, U. (2006) 'Living in the World Risk Society', *Economy and Society*, vol. 35, no. 3, pp. 329-345.
- Benson, R. (2009) 'Shaping the Public Sphere: Habermas and Beyond', *The American Sociologist*, vol. 40. no. 3, pp.175-197.
- Berger, P.l. and Luckmann, T. (1966) *The Social Construction of Reality: A Treatise in the Sociology of Knowledge*, New York: Penguin.
- Besley, J. C. and Oh, S.-H. Forthcoming, 'The Impact of Accident Attention, Ideology, and Environmentalism on American Attitudes Toward Nuclear Energy', *Risk Analysis* (Online). Accessed 13 December 2013), Available from: http://onlinelibrary.wiley.com/doi/10.1111/risa.12151/abstract
- Bickerstaff, K., Lorenzoni, I., Pidgeon, N.F., Poortinga, W. and Simmons, P. (2008) Reframing nuclear power in the UK energy debate: nuclear power, climate change mitigation, and radioactive waste. *Public Understanding of Science*, vol. 17. no. 2. pp. 145–169.
- Brouard, S. and Guinaudeau, I. (2013) *Policy beyond politics? Public opinion, party politics and the French pro-nuclear energy policy,* (Online) Grenoble: Sciences Po Grenoble. working paper n.6. (accessed 10 December 2013) Available from: <a href="http://halshs.archives-ouvertes.fr/halshs-00911445">http://halshs.archives-ouvertes.fr/halshs-00911445</a>
- Buda, B. (1988) *A közvetlen emberi kommunikáció szabályszerűségei*, Budapest: Tömegkommunikációs Kutatóközpont.

- Cabinet of Finland (2011): *Programme of Prime Minister Jyrki Katainen's Government,* (Online) (accessed: 7 October, 2012). Available from: <a href="http://valtioneuvosto.fi/hallitus/
- Castells, M. (2009) Communication Power. Oxford: Oxford University Press.
- Chomsky, N. and Herman, E.S. (1988) *Manufacturing Consent: The Political Economy of the Mass Media*, New York: Pantheon Books.
- Dahlberg, L. (2004) 'The Habermasian Public Sphere: A Specification of the Idealized Conditions of Democratic Communication', *Studies in Social and Political Thought, (Online)*. accessed 3 February 2014, Available from: <a href="https://www.academia.edu/1412444/The\_Habermasian\_public\_sphere\_A\_specification\_of">https://www.academia.edu/1412444/The\_Habermasian\_public\_sphere\_A\_specification\_of</a> the idealized conditions of democratic communication
- Dahlberg, L. (2005) 'The Habermasian Public Sphere: Taking Difference Seriously?', *Theory and Society*, vol. 34. no. 2. pp. 111-136.
- Devereux, G. (1967) From Anxiety to Method in the Behavioral Sciences, The Hague: Mouton.
- Diekmann, A., Meyer, R., Mühlemann, C. and Diem, A. (2009) *Schweizer Umweltsurvey 2007, Analysen und Ergebnisse,* Bericht für das Bundesamt für Statistik (BFS) und das Bundesamt für Umwelt (BAFU) (Online), 27 March, 2009, (accessed 11 May, 2014), Available from: <a href="http://www.socio.ethz.ch/research/umweltsurvey/umweltsurvey/umweltsurvey/2007/public ations/UWS07AnalysenErgebnisseBerichtBFSBAFU.pdf">http://www.socio.ethz.ch/research/umweltsurvey/umweltsurvey/umweltsurvey/2007/public ations/UWS07AnalysenErgebnisseBerichtBFSBAFU.pdf</a>
- van Dijk, T.A. (1989) 'Structures of discourse and structures of power', In: Anderson J.A. ed. *Communication Yearbook,* Newbury Park, CA: Sage, pp. 18-59.
- van Dijk, T.A. (1991) Racism and the Press. New York and London: Routledge.
- Dobi, B. (2012) *Important stakeholder interactions in 1 and Phase 2 of the nuclear power programme in Hungary: Intervention of the Hungarian government,* IAEA Infrastructure Meeting, 20 March, Vienna.
- Edelman (2012), *Edelman Trust Barometer*, (accessed 3 April 2013), Available from: <a href="http://www.edelman.com/insights/intellectual-property/2012-edelman-trust-barometer/about-trust/global-results/">http://www.edelman.com/insights/intellectual-property/2012-edelman-trust-barometer/about-trust/global-results/</a>
- Edwards, A.L. (1957) *Techniques of Attitude Scale Construction*, New York: Irvington Publishers.
- Eley, G. (1992) 'Nations, Publics, and Political Cultures: Placing Habermas in the Nineteenth Century', In: Calhoun, C. ed. *Habermas and the Public Sphere*, Cambridge, MA: Massachusetts Institute of Technology, pp. 289-339.
- Eurobarometer (2011) *The Europeans and Energy* (Online) Standard EB 74.3 on Energy, 31 January (accessed 8 February, 2012) Brussels: European Parliament. Available from: http://ec.europa.eu/energy/studies/doc/20110131 eurobarometer energy.pdf

- Eurobarometer (2012) *Public Opinion in the European Union* (Online) Standard EB 78 Autumn 2012, (accessed 10 February, 2012) Brussels: European Parliament. Available from: <a href="http://ec.europa.eu/public opinion/archives/eb/eb78/eb78">http://ec.europa.eu/public opinion/archives/eb/eb78/eb78</a> first en.pdf
- Fairclough, N. (1995) Critical Discourse Analysis, London: Longman.
- Felt, U. and Wynne B. (2007) *Taking European knowledge society seriously*. (Online) Brussels: European Commission, (accessed 24 January, 2014). Available from: <a href="http://www.synbioproject.org/process/assets/files/6452/\_draft/european-knowledge-society-en.pdf">http://www.synbioproject.org/process/assets/files/6452/\_draft/european-knowledge-society-en.pdf</a>
- Festinger, L. (1957) *A Theory of Cognitive Dissonance*, Stanford, CA: Stanford University Press.
- Fjaestad, M. and Hakkarainen, P. (2013) *Sweden, Finland and the German Energiewende*, Berlin: Friedrich Ebert Stiftung. (accessed 5 February 2014), Available from: http://library.fes.de/pdf-files/id/10163.pdf
- Fowler, R. (1991) *Language in the news: Discourse and ideology in the press*, New York: Routledge.
- Foucault, P.-M. (1966). Les mots et les choses, Paris: Éditions Gallimard.
- Fraser, N. (1990) 'Rethinking the Public Sphere: A Contribution to the Critique of Actually Existing Democracy', *Social Text*, no. 25-26. pp. 56-80.
- Genis, D. (2013). The Role of Scientists in Lithuanian Energy Security Discourse Formation, *Baltic Journal of Law and Politics*, vol. 6. no. 1. pp. 166-183.
- Gold, R.L. (1958) 'Roles in sociological field observations', *Social Forces, vol. 36. no. 3. pp. 217-223*.
- Greenberg, M. and Truelove, H.B. (2011): 'Energy Choices and Risk Beliefs: Is It Just Global Warming and Fear of a Nuclear Power Plant Accident?' *Risk Analysis*, vol. 31. no. 5. pp. 819-831.
- de Groot, J.I.M. and Steg, L. (2010) 'Morality and Nuclear Energy: Perceptions of Risks and Benefits, Personal Norms, and Willingness to Take Action Related to Nuclear Energy', *Risk Analysis*, vol. 30. no. 9. pp. 1363-73.
- Habermas, J. (1962) *Strukturwandel der Öffentlichkeit*, Darmstadt and Neuwied: Luchterhand Verlag.
- Haverkamp, J. (2013) Priorities for Implementation of the Aarhus Convention in the Nuclear Sector, *Public Participation in Decision Making in the Nuclear Domain, Luxembourg, 12-13 March, 2013*
- IAEA (2013): The Follow-up IAEA International Mission on Remediation of Large Contaminated Areas Off-site the Fukushima Daiichi Nuclear Power Plant, Preliminary Summary Report, (Online), 21 October, (accessed 25 December, 2013), Available from: http://www.iaea.org/newscenter/focus/fukushima/remediation-report-211013.pdf

- Heller, M. and Rényi, Á. (1996) 'A nyilvános kommunikáció szociológiai modellje', *Jelkép*, no. 4. pp. 3-21.
- Johnson, B.B. (1999) 'Exploring Dimensionality in the Origins of Hazard Related Trust', *Journal of Risk Research*, vol. 2. no. 4. pp. 325-354.
- Jorgensen, D.L. (1989) Participant Observation. A Methodology for Human Studies, Thousand Oaks, CA: Sage.
- Klapper, J. (1949) The Effects of Mass Communication, New York: Free Press.
- Lányi, A. (2012) 'Az ökológia, mint politikai filozófia', *Politikatudományi Szemle*, vol. XXI. no. 1. pp. 105–132.
- Lever, A. (2013) *Perceiving Security: A Word of Caution on the Ethics Survey,* (Online) <a href="http://www.alever.net/DOCS/Perceiving\_Security\_A\_Word\_of\_Caution\_on\_the\_Ethics\_Surveys.pdf">www.alever.net/DOCS/Perceiving\_Security\_A\_Word\_of\_Caution\_on\_the\_Ethics\_Surveys.pdf</a>
- Lorenzoni, I., Nicholson-Cole, S. and Whitmarsh, L. (2007) Barriers Perceived to Engaging with Climate Change among the UK Public and their Policy Implications. *Global Environmental Change*, vol. 17. no. 3-4., pp. 445-459.
- Maderthaner, R., Guttman, G., Swaton, E. and Otway, H.J. (1978) 'Effect of Distance upon Risk Perception', *Journal of Applied Psychology*, vol. 63. no. 3. pp. 380-382.
- Mansell, R. (ed.) (2002) *Inside the Communication Revolution: Evolving Patterns of Social and Technical Interaction*. Oxford: Oxford University Press.
- Mariotte, M. (2012) *Nuclear Power and Public Opinion: What the polls say*. (Online) Daily Kos, 5 June. (accessed 5 March, 2014) Available from: <a href="http://www.dailykos.com/story/2012/06/05/1097574/-Nuclear-Power-and-Public-Opinion-What-the-polls-say">http://www.dailykos.com/story/2012/06/05/1097574/-Nuclear-Power-and-Public-Opinion-What-the-polls-say</a>
- Marshall, C. and Rossman, G.B. (1989). *Designing qualitative research*. Newbury Park, CA: Sage.
- McCombs, M. E. and Shaw, D. (1972) The agenda-setting function of mass media. In: Boyd-Barret, O. and Newbold C. eds. *Approaches to Media*. *A Reader*, London: Arnold.
- McKenna, J. (1995). Politics, Participation and the Public Sphere. Unit 10. MA in Mass Communications (by Distance Learning). Department of Media & Communication, University of Leicester, UK.
- McLuhan, M. (1962) *The Gutenberg Galaxy: the Making of Typographic Man.* Toronto: University of Toronto Press.
- Midden, C. J. H. (1986) *Individu en Grootschalige Technologie: Een VergelijkendeStudie naar de Electriciteitsproductiemet Kolen en Uraan*, Dissertation, Leiden University, the Netherlands.

- Ministry of State for Energy Affairs (2013) *Statement of Hungary*, (Online) 18 September (accessed 5 March, 2014), Available from: <a href="http://www.iaea.org/About/Policy/GC/GC57/Statements/hungary.pdf">http://www.iaea.org/About/Policy/GC/GC57/Statements/hungary.pdf</a>
- MKIK Gazdaság- és Vállalkozáskutató Intézet (2011) *A fukusimai atomerőmű-szerencsétlenség sajtóelemzése,* (Online) Budapest: MKIK (accessed 30 May, 2013). Available from: <a href="http://www.gvi.hu/data/papers/fukusima">http://www.gvi.hu/data/papers/fukusima</a> 2011 tanulmany 111128 .pdf
- Mulder, K. (2012) 'The dynamics of public opinion on nuclear power. Interpreting an experiment in the Netherlands', *Technological Forecasting and Social Change*, vol. 79. no. 8. pp 1513-1524.
- OECD (2010) *Public Attitudes to Nuclear Power*, (Online) (accessed 25 July, 2012) Available from: <a href="http://www.oecd-nea.org/ndd/reports/2010/nea6859-public-attitudes.pdf">http://www.oecd-nea.org/ndd/reports/2010/nea6859-public-attitudes.pdf</a>
- Otway, H.J. and Fishbein, M. (1977) *Public Attitudes and Decision Making*, (Online) Laxenburg: IIASA. Research memorandum. (Accessed 12 December 2013). Available from: <a href="http://www.iiasa.ac.at/publication/more">http://www.iiasa.ac.at/publication/more</a> RM-77-054.php
- Otway, H.J., Maurer, D. and Thomas, K. (1978) Nuclear Power: The Question of Public Acceptance, *Futures*, vol. 10. no. 2. pp. 109-118.
- Paul, B. (1953). Interview Techniques and Field Relationships. In: Kroeber, A.L. ed. *Anthropology Today*, Chicago: University of Chicago Press.
- Poortinga, W. and Pidgeon, N.F. (2003) *Public Perceptions of Genetically Modified Food and Crops, and the GM Nation?* Public Debate on the Commercialisation of Agricultural Biotechnology in the UK, University of East Anglia, work paper, (accessed 6 March, 2014) Available from: <a href="http://psych.cf.ac.uk/understandingrisk/docs/survey-2003.pdf">http://psych.cf.ac.uk/understandingrisk/docs/survey-2003.pdf</a>
- Poortinga, W. and Pidgeon, N.F. (2003) 'Exploring the Dimensionality of Trust in Risk Regulation', *Risk Analysis*, vol. 23. no. 5. pp. 961-972.
- Poortinga, W., Pidgeon, N. and Lorenzoni, I. (2006) *Public Perceptions of Nuclear Power, Climate Change and Energy Options in Britain: Summary Findings of a Survey Conducted during October and November 2005*, Centre for Environmental Risk + Tyndall Centre for Climate Change Research. Understanding Risk working paper 06-02
- Pralle, S., Boscarino, J. (2011) 'Framing Trade-offs: The Politics of Nuclear Power and Wind Energy in the Age of Global Climate Change', *Review of Policy Research*, vol. 28. no. 4. pp. 323–346.
- Poype, A-L. and Sood, S. (2012) 'Public Sphere Dialogue in Online Newspapers and Social Spaces: The Nuclear Debate in Post Fukushima France', *Public Communication Review*, (Online) vol. 2. no. 2. Available from: <a href="http://epress.lib.uts.edu.au/journals/index.php/pcr/article/view/2834">http://epress.lib.uts.edu.au/journals/index.php/pcr/article/view/2834</a>
- Price, V. and Neijens, P. (1998) 'Deliberative Polls: Toward Improved Measures of 'Informed' Public Opinion?', *International Journal of Public Opinion Research*, vol. 10. no. 2. pp. 145-176.
- Reisigl, M. and Wodak, R. (2009) The Discourse Historical Approach in Critical Discourse Analysis, In Wodak, R. and Meyer. M. eds. *Methods of Critical Discourse Analysis* (2nd edition), London: Sage.

- Renn, O., Levine, D.: Credibility and Trust in Risk Communication. In R.E. Kasperson and P. J. M. Stallen (Eds.), Communicating Risks to the Public. The Hague: Kluwer. 1991
- Rogers, G.O. (1984) Residential Proximity, Perceived and Acceptable Risk, In: Waller, R.A. and Covello, V.T. eds. *Low Probability, High Consequence Risk Analysis*, New York: Plenum Press.
- Rosa, E. A. and Dunlap, R. (1994) 'Nuclear power: Three Decades of Public Opinion', *Public Opinion Quarterly*, vol. 58. no. 2. pp. 295–324.
- von Roten, F. C. (2012) The human-animal boundary in Switzerland: a cross-cultural perspective. In: Bauer, M. W., Shukla, R. and Allum, N. eds. *The Culture of Science How does the Public relate to Science across the Globe?* New York: Routledge pp. 319-331.
- von Roten, F. C. (2013) Society, Politics and Nuclear Energy in Switzerland, *Journal of Scientific Temper*, vol. 1. no. 3&4. pp. 101-118.
- Sarlós, G. (2013) 'The Issue of Safety and Security in the Discourse about Nuclear Energy in Hungary', (Online), in *Culture of Safety and Defence*, e-book, (Accessed: 10 September. 2013), Available from: http://psharg.com/Preview/gabor-sarlos.html
- Sarlós, G. (2014) *Power and Weakness in the Nuclear Discourse*, Kulcskérdések conference, 3 April, Budapest
- Scheufele, D.A. (2011) Modern Citizenship or Policy Dead End? Evaluating the Need for Public Participation in Science Policy Making, and Why Public Meeting may not be the Answer, (Online) Madison: University of Wisconsin, Research Paper (Accessed: 10 December, 2013), Available from: <a href="http://shorensteincenter.org/wp-content/uploads/2012/03/r34\_scheufele.pdf">http://shorensteincenter.org/wp-content/uploads/2012/03/r34\_scheufele.pdf</a>
- Schmuck, R. (1997). *Practical action research for change,* Arlington Heights, IL: IRI/Skylight Training and Publishing
- Schwartz, S.H. (1977) Normative influences on altruism, In Berkowitz, L. ed. *Advances in Experimental Social Psychology*, vol. 10. New York: Academic Press. pp. 221-279.
- Schwartz, S.H. and Howard, J.A. (1981) A normative decision-making model of altruism. Chapter 9 in Rushton, J.P. and Sorrentino, R.M. eds. *Altruism and Helping Behavior*. Hillsdale, NJ: Lawrence Erlbaum.
- Semenza, J.C., Hall, D.E., Wilson, D.J., Bontempo, B.D., Sailor, D.J. and George, L.A. (2008) Perception of Climate Change. Voluntary Mitigation and Barriers to Behavior Change, *American Journal of Preventive Medicine* vol. 35. no. 5. pp. 479–487.
- Simon, R. (2007) 'Climate could turn friends into foes as some go nuclear', *The Los Angeles Times*, (Online) 9 April, Available from: <a href="http://articles.latimes.com/2007/apr/09/nation/nanuke9">http://articles.latimes.com/2007/apr/09/nation/nanuke9</a>
- Sjoberg, L. (2000) 'Factors in Risk Perception', Risk Analysis vol. 20. no.1. pp. 1–11.
- Sjoberg, L. (2004) 'Explaining Individual Risk Perception: the Case of Nuclear Waste', *Risk Management: An International Journal* vol. 6. no. 1. pp. 51–64.

- Slovic, P. (1987) 'Perception of Risk', Science, vol. 236. no. 4799. pp. 280-285.
- Slovic, P. (2000) *The Perception of Risk*, London: Earthscan.
- Solt, O. (1978, 1998): Interjúzni muszáj, In: *Méltóságot mindenkinek. Összegyűjtött írások I.* Budapest: Beszélő, pp. 29–48.
- Szabó, M. (1998). A politikai szemantika lehetőségei. A társadalomtudományok nyelvikonstrukciós fordulata és a politológia. In: Szabó, M. ed. *Diszkurzív térben. Tanulmányok a politika nyelvéről és a politikai tudásról*, Budapest: Scientia Humana.
- Szabó, M. (2006) Politikai idegen, Budapest: L'Harmattan.
- Tamás, P. (2000) A tematizációról. In: Kiss, B, ed. *Politikai kommunikáció*, Budapest: Rejtjel Kiadó.
- Tedlock, B. (1991) 'From Participant Observation to the Observation of Participation: The Emergence of Narrative Ethnography', *Journal of Anthropological Research*, vol. 47. no. 1. pp. 69-94.
- Thomas, K., Maurer, D., Fishbein, M., Otway, H.J., Hinkle, R. and Simpson, D.A. (1979) *Comparative Study of Public Beliefs About Five Energy Systems*, (Online). Laxenburg: IIASA, Research memorandum. (Accessed 12 December, 2013) Available from: <a href="http://www.iiasa.ac.at/publication/more\_RR-80-015.php">http://www.iiasa.ac.at/publication/more\_RR-80-015.php</a>
- TNS (2013) Attitudes towards radioactive waste in Switzerland, Report, (Online), September 2013, (accessed 11 May, 2014), Available from: <a href="http://www.news.admin.ch/NSBSubscriber/message/attachments/32079.pdf">http://www.news.admin.ch/NSBSubscriber/message/attachments/32079.pdf</a>
- Török, G. (2001) Politikai napirendek és a média. In: Sükösd, M. and Csermely, Á. eds. *A hír értékei. Etika és professzionalizmus a mai magyar médiában*, Budapest: Média Hungária Könyvek
- Yle (2010) Finns Remain Opposed to Additional Nuclear Power Reactors (2010) 29 March, 2010, *Uutiset*, (Online) 29 March. (accessed 23 December 2013) Available from: http://yle.fi/uutiset/finns remain opposed to additional nuclear power reactors/5536424
- Vári, A. (2009) Tiszta atomenergia? Radioaktív hulladékkezelés Magyarországon és külföldön, Budapest: L'Harmattan
- Venables, D., Pidgeon, N.F., Parkhill, K.A., Henwood, K.L. and Simmons, P. (2012) 'Living with nuclear power: Sense of place, proximity, and risk perceptions in local host communities', *Journal of Environmental Psychology*, vol. 32. no. 4. pp. 371–383.
- Visschers, V.H.M., Keller, C. and Siegrist, M. (2011) Climate change benefits and energy supply benefits as determinants of acceptance of nuclear power stations: Investigating an explanatory model, *Energy Policy* vol. 39. no. 6. pp. 3621-3629.
- Weinberg, A.M. (1991) Nuclear Power and Public Perception. In Shubik, M. ed. *Risk, Organizations, and Society*, Dordrecht: Kluwer Academic Publishers.

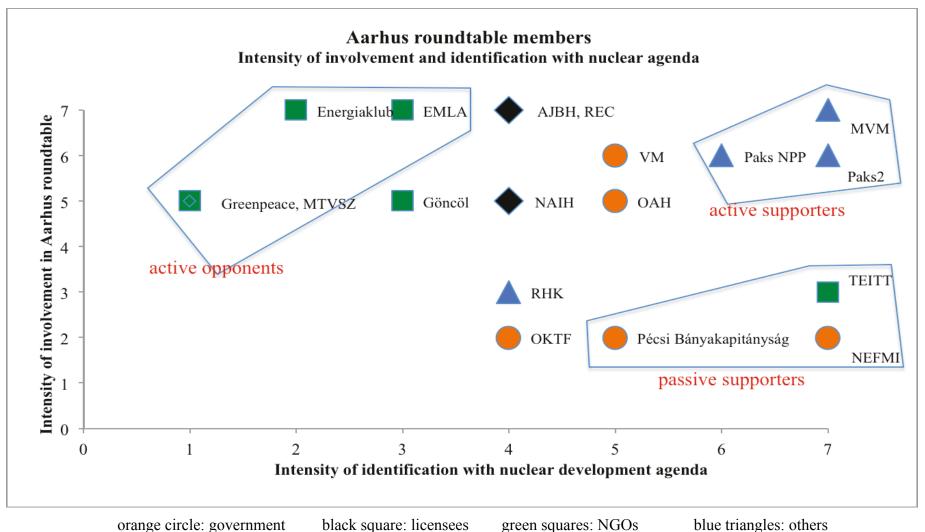
## ANNEX 1

## **Members of the Aarhus roundtable**

Name (Hungarian) (WG members in	Name (English) (WG members in	Affiliation			
bold)	bold)		NGO	gov	other
Alapvető Jogok Biztosának Hivatala (AJBH) (previously Jövő Nemzedékek	Office of the Commissioner for Fundamental Rights				X
Országgyűlési Biztosának Hivatala)	co-coordinator of roundtable				
ÁNTSZ Országos Tisztifőorvosi Hivatal	National Public Health and Medical Officer Service			X	
Dél-dunántúli Környezetvédelmi, Természetvédelmi és Vízügyi Felügyelőség	Southern Transdanubia Inspectorate For Environment, Nature and Water			X	
EMLA	EMLA		X		
Energiaklub	Energy Club		х		
Göncöl Alapítvány	Göncöl Foundation		X		
Greenpeace	Greenpeace		х		
Magyar Természetvédők Szövetsége (MTVSZ)	National Society of Conservationists		х		
Magyar Tudományos Akadémia KFKI Atomenergia Kutatóintézet (AEKI)	Hungarian Academy of Sciences KFKI Atomic Energy Research Institute				X
Magyar Villamos Művek Zrt. (MVM)	Hungarian Electricity Ltd.	X			
MVM Paks 2 Zrt. (member from 12 December 2013)	MVM Paks 2 Zrt.	х			
MVM Paksi Atomerőmű Zrt.	MVM Paks NPP Zrt.	х			
Nemzeti Adatvédelmi és Információszabadság Hatóság (NAIH) (previously Adatvédelmi Biztos Hivatala)	Hungarian National Authority for Data Protection and Freedom of Information				X
Nemzeti Fejlesztési Minisztérium	Ministry of National Development			X	
NUBIK Nukleáris Biztonsági Kutatóintézet	Nuclear Safety Research Institute				х
Nyugat-Mecseki Társadalmi Információs Társulás (NYMTIT)	Western Mecsek Public Information Association		X		

Name (Hungarian) (WG members in	Name (English) (WG members in	Affiliation			
bold)	bold)		NGO	gov	other
Országos Atomenergia Hivatal (OAH)	Hungarian Atomic Energy Authority			X	
Országos Környezetvédelmi, Természetvédelmi és Vízügyi Főfelügyelőség (OKTF)	National Inspectorate For Environment, Nature and Water			X	
Országos Sugárbiológiai és Sugáregészségügyi Kutató Intézet	National Research Institute for Radiobiology and Radiohygiene			Ī	X
Pécsi Bányakapitányság	Pécs District Mines Inspectorate			X	
Radioaktív Hulladékokat Kezelő Közhasznú Nonprofit Kft. (RHK)	Public Limited Company for Radioactive Waste Management (PURAM)	Х			
Regionális Környezetvédelmi Központ (REC)	Regional Environmental Center  co-coordinator of roundtable				X
Társadalmi Ellenőrző, Információs és Területfejlesztési Társulás (TEITT)	Public Monitoring, Information and Regional Development Association		X		
Vidékfejlesztési Minisztérium	Ministry of Rural Development			X	

**ANNEX 2** 



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# **ANNEX 3**Distribution of articles by geographical focus

Red color indicates articles with international relevance only, green indicated Hungarian focus, while yellow articles bear both Hungarian and international com-

Content	2012
Iran the nuclear program of the country and the various international attempts to set up control	17
Paks expansion plans related to the expansion of the Paks NPP	5
Japan national parliamentary elections with the issue of nuclear energy and the Fukushima disaster of 2011 in focus	17
Egypt political fights and the role of El-Baradei, former DG of the International Atomic Energy Agency	17
Protocol 'colorful' articles of lesser relevance	5
nuclear strategy strategic announcements about Hungarian nuclear development plans and actions	-
Paks life cycle extension preparation and acceptance of Paks life cycle extension	5
energy policy plans and execution of a the Hungarian energy policy	10
nuclear energy cooperation agreement and talks between Hungary and other countries	-
safety of NPPs accounts and developments related to safety of nuclear power plants in Hungary and internationally	9
domestic politics news related to discussions in the Parliament and of parties related to the use of nuclear energy	8
Germany the topic of nuclear energy in relation to the federal elections in 2013	3
nuclear energy management nuclear waste management site and transportation	2
energy security security of energy supply	1

Content	2012	2013	total
Mexico news related to the theft of an uranium rich container	-	5	5
North Korea use of nuclear energy for energy production and for military purpose	4	-	4
opinion poll polls researching public perception of nuclear energy	-	4	4
Israel program for the civilian and military use of nuclear energy	3	-	3
uranium and radiation treatment of the natural resource	-	3	3
Syria the potential nuclear capacity of the country	2	-	2
energy price examination of nuclear energy and energy prices	2	-	2
NATO military exercise	2	-	2
climate policy	_	2	2
European Parliament EP MP opinions on nuclear energy	-	2	2
Vietnam education of nuclear experts in Hungary	1	-	1
international politics overview of previous year and nuclear energy from that perspective	1	-	1
culture critical film review with mention of nuclear energy	1	-	1
Korea	-	1	1
energy efficiency news about saving energy	-	1	1
France debate about the future of NPPs in France	-	1	1
India news about the Indian NPPs	-	1	1
spying nuclear issues in the US spying case	-	1	1
support supporting development of other areas	-	1	1
Slovakia nuclear plans of Slovakia	-	1	1
TOTAL	115	137	252

#### **ANNEX 4**

#### Perceptions on the need of Paks expansion and the need for a referendum

Independent, representative poll

#### - In your view, is there a need to build 2 further reactors in the Paks NPP?

Definitely not

Rather not

Rather yes

Definitely yes

Don't know

### - Do you believe you have enough information about the expansion of the Paks NPP?

No, and I don't find it important to learn more about it

No, and I would be interested in learning more abut the economic and financial aspects

No, and I would be interested in learning more abut the technical aspects

No, and I would be interested in learning more abut the environmental aspects

No, and I would be interested in learning more abut the political aspects

Yes

Don't know

## 3. Do you think that, similarly to other countries, expansion about the Paks NPP should be decided on a referendum?

Yes because this in issue that is highly relevant to all of us

Yes because this is gigantic investment the burden of which we will all share

Yes because I would like to have my say what the source of our electric energy should be

No because this issue is too complicated

No because experts can decide much better on this

No because anyway this is decided by the politicians

Don't know