

Peter Hocke-Bergler / Martin Stolle

**Nuclear Waste Management in Germany and the Difficulties
of Public Policy. An Empirical Case Study about Collective
Action of Experts in a Stalemate Situation**

Presented paper for Panel 22-2 ("The Technological Risks as a Challenge to democratic
Policy Making") in Section "Politics and Technology" at the Second General Conference of
the European Consortium of Political Research (ECPR), Marburg, September 18-21, 2003

Table of Contents

1. ABSTRACT	2
2. INTRODUCTION	2
3. DATA AND METHODS	5
4. EMPIRICAL RESULTS	8
4.1 MEDIA ANALYSIS	8
4.1.1 <i>Low but constant final disposal coverage, largely without mention of AkEnd.</i>	8
4.1.2 <i>Sceptical but no openly tendentious media coverage.....</i>	13
4.2 SURVEY IN 2001	16
4.2.1 <i>How is the problem of nuclear waste disposal perceived by the population?</i>	16
4.2.2 <i>Political participation</i>	21
4.2.3 <i>Attitudes to the use of nuclear energy</i>	24
5. CONCLUSION.....	27
REFERENCES	29

Peter Hocke-Bergler

Martin Stolle

Institute for Technology Assessment and Systems Analysis
Karlsruhe Research Centre
Hermann-von-Helmholtz-Platz 1
D – 76 344 Eggenstein

email: hocke@itas.fzk.de

email: Martin.Stolle@t-online.de

1. Abstract

Nuclear waste management is a current topic of German public policy-making. Experts, politicians and authorities try to reduce the specific risk arising from nuclear power and its high-level radioactive waste. This happens in the context of a nearly thirty years old societal conflict about the use of nuclear power and doubts about the suitability of the existing final disposal projects. At the same time, the amounts of nuclear waste are growing, independent of the decision on the nuclear power phase-out. The risks arising from this high-level radioactive and highly toxic waste will be minimised or even impeded by sophisticated procedures and technologies of disposal. As the realisation of nuclear waste disposals is blocked in general, the red-green federal government started to prepare a new process of decision-making. A committee of experts called "Arbeitskreis Auswahlverfahren Endlagersuche" (AkEnd) was commissioned to develop a procedure and criteria for the selection of repository sites for radioactive waste, which was prepared in cooperation with public stakeholders. In the following years, this procedure should be realised with participation of stakeholders and the general public. Our paper presents results from an empirical case study about this attempt of public policy. We firstly report on how the actual policy regarding this issue is structured by collective action of the government and their experts. Secondly, we present data on the media resonance and reconstruct the effects of the experts' action. By analysis of survey data, we thirdly show how people think about the issue of nuclear waste and participation. As a conclusion we draft options and limits of public policy-making in view of this specific target.

2. Introduction

Doubts about the suitability and political enforceability of the final disposal projects Gorleben and Schacht Konrad prompted the Red-Green Federal Government to tread new paths in the search for a final disposal site for nuclear waste. Since conflicts about these two final disposal projects had already led to major domestic and technological controversies as well as to prolonged legal disputes for almost three decades, the situation ended up in a block of decision-making in this political field. In 1998/99, the Red-Green Federal Government therefore decided to initiate a new decision-making process. The federal ministry of the

environment commissioned a pluralistic committee of experts to design this new decision-making process. The task of this expert committee (called AkEnd for “Arbeitskreis Auswahlverfahren Endlagersuche” / Task Group Selection Procedure Nuclear Waste Disposal Sites) was to develop criteria for a practicable comparative site selection as well as a proposal for the realisation of the selection procedure. The resulting expertise should on the one hand contribute to removing blocks of decision-making and on the other hand speed up the establishment of a disposal site for nuclear waste. The explosive nature of the fact that the realisation of a final disposal site for radioactive has not yet been accomplished became apparent in the debate on security after September 11th which also referred to the existing disposal of waste in different forms of temporary storage sites.

Worldwide, no final disposal site for high-level nuclear waste has been put into operation so far. Therefore, it is not possible to fall back on explicit international experience. The decision in 2001 to phase out the production of nuclear power in Germany (“Ausstiegsbeschluss”) does not change the problem of decision-making either. Today, there are already considerable amounts of high-level radioactive waste. Until the shutdown of the last nuclear reactor there will be twice as much nuclear waste to deal with.¹ As shown by the history of the negotiations on a nuclear phasing out, in the context of which a moratorium for the Gorleben exploratory mine for final disposal was also adopted, stalemated constellations of actors are facing each other in the conflict about the final disposal of nuclear waste (see Rüdiger 2000; Raschke 2001: 170-216, Mez 2001). The task of AkEnd was to tackle this problem with the development of a proposal for a comparative search for final disposal sites. This new search for a final disposal site should be performed on the basis of criteria and with participation of the public. These criteria which shall reflect the current state of relevant research do not only include criteria of security engineering and natural science but also of social and planning sciences. In December 2002, the expert committee AkEnd, in which both opponents and supporters of nuclear power were represented, submitted its report with a concrete proposal for a comparative selection of a final disposal site without any minority vote (AkEnd 2002; Jentzsch 2003). This proposal for a selection procedure can be described as discourse- and negotiation-oriented.²

¹ For information on nuclear waste amounts see Jentzsch 2003, p. 32

² On the concepts of deliberative democracy and public sphere, which are important here, see Hurrelmann et al. 2002, pp. 545-548, and Ferree et al. 2002.

A central guideline for AkEnd was to involve the interested public already in the development of a proposal for a selection procedure (Renneberg 2001: p. 146). Therefore, AkEnd presented and discussed its considerations already during the preparation of the expertise at three large public events, a series of discussions with stakeholders from politics, industry and society, and at conferences and similar events for professionals. Furthermore, supporting and accompanying research was carried out. The results presented here come from an evaluation project at the Institute for Technology Assessment and Systems Analysis in the Karlsruhe Research Centre. The project “Communication of Experts in the Conflict on Nuclear Waste Management” carried out there examines framework conditions and public effects of AkEnd within the policy process AkEnd is involved in. Besides the sociological evaluation of AkEnd’s public activities this investigation – carried out for AkEnd – also included the implementation of two representative surveys and an empirical media analysis. These studies contribute to the sociological discussion on final disposal in Germany which has been interrupted during the last two decades. Meanwhile, there are first publications which are derived from the contexts of more decision-oriented science (Ipsen 2003; Lennartz/Mussel 2002; Dally 2003, Dally 2003a, Hocke-Bergler/Stolle 2003). In the international context, a smaller discussion has developed in the last ten years, which until recently strongly referred to the respective national contexts and which is only now extended a little (e.g. Andersson 2003, Sundqvist 2002, National Research Council et al. 2001, Dunlap et al. 1993). Using the example of AkEnd, the paper presented here describes the chances and limits encountered by German experts on nuclear waste disposal in their joint effort to break up a blocked process of decision-making through public policy.

Conceptually, the study is based on a further development of the Arena model of public sphere as proposed by Kriesi in his scheme for the analysis of the public sphere in the political decision-making process. (Kriesi 2003: p. 213). The arena of public sphere and the arena of political bargaining are two different systems of action with only limited connection. While the bargaining arena is determined by the established political actors as well as the actors of interest aggregation (particularly parties and some few lobbies), the public is not directly associated with these established actors in decision-making, including legislative and executive branches. In the arena of public sphere, however, the relationships among active actors are more open. The public can articulate their views and participate via its (often also little established) civil society associations. Besides the established political actors – such as

political parties, governmental organisations, and classic actors in lobbying – outsiders and protest groups can also become actors of the interest articulation competing with each other for mass media attention. In complex interaction processes between mass media and public opinion, alternative actions are developing where the importance of experts and their topic-related expertise is persistently growing (Weingart 2003: 95-102; Bechmann/Hronsky 2003). Here, both the “public opinion”, which can be reconstructed via surveys, and the behaviour of the media become influencing variables – particularly in case of continued conflicts –, which have a decisive influence both on problem treatment (in view of policy output) and on integration into civil society (Weßler 2002). In their action, the experts of AkEnd therefore had to consider the arena of the public sphere and the arena of political decision-making.

3. Data and Methods

The task of the ITAS project “Communication of Experts in the Conflict of Nuclear Waste Management” is to evaluate the public activities of AkEnd in the years 2000 to 2002 from the perspective of social sciences. Central research activities are to carry out an empirical media analysis and two representative surveys on the subject of final disposal of radioactive waste. Detailed empirical results and comparative evaluations of the project are expected to be available at the end of 2003. Here we present first results.

Media analysis. The aim of the media analysis is to record the intensity of the debate on final disposal sites and the mass media coverage received by AkEnd. For this purpose, selected daily and weekly newspapers, as well as specialized media were submitted to a continuous observation and evaluated using methods of quantitative and qualitative content analysis.

For the empirical media analysis two data records were created. The first record refers to the period from June 2001 to October 2002, in order to observe the debate on final disposal during the work of AkEnd. A second data record covers the period from 1997 to May 2001, in order to obtain an empirical comparison period.³ The data for 2001 and 2002 are representative of the German media system with its different trends, and cover newspaper articles on the topics of “nuclear energy” and “final disposal of nuclear waste”. The second

data record is limited to a smaller selection of print media and covers only articles on the topic of “final disposal of nuclear waste”. For each of the two periods a complete coverage was carried out. As unit of analysis for the quantitative content analysis the individual “media mentions” on the respective topics was taken. This way, all reports dealing with these topics or at least taking them up in a certain part during the above-mentioned period were recorded.

The media sample comprises the following print products: “Frankfurter Allgemeine Zeitung” and “Frankfurter Rundschau” as national subscription newspapers, “Focus” and “Spiegel” as weekly magazines, “Financial Times” and “Handelsblatt” as daily business papers: “Bild” as tabloid, “die tageszeitung” as a left-alternative daily newspaper, “Freie Presse Chemnitz - Zwickauer Zeitung”, “Lausitzer Rundschau”, “Südkurier” and “Elbe-Jeetzel-Zeitung” as regional subscription newspapers as well as “atomwirtschaft / atomtechnik”, “Strahlentelex / Elektrosmog-Report”, and “anti-atom-aktuell” as professional journals. The sample for the retrospective data set refers to the following print products: “Frankfurter Allgemeine Zeitung”, “Frankfurter Rundschau”, “die tageszeitung” and “Spiegel” as well as “atomwirtschaft / atomtechnik” and “Strahlentelex / Elektrosmog-Report”.

The media sample is innovative because it both covers important German print media and differentiates between media types. The observation of the media response was limited to coverage in the press, because the print media are classic actors to which an outstanding role within the process of public opinion-formation is attributed. Compared to broadcasting and television they also have a considerably larger information volume. This information volume is intensely used both by the “lay public” as well as the interested and expert public. Thus, print media are also of outstanding importance for a broad social dialogue. A total of 2,974 data records was collected and evaluated, 1,833 of which related to the period from June 2001 to October 2002.

Surveys. Within the evaluation project for AkEnd, two nationwide representative surveys were conducted in the years 2001 and 2002. They aim to measure the change in people’s attitude to technology, to the final disposal of nuclear waste, and to political participation, as well as ascertain the public awareness of AkEnd as a committee of experts.

³ In the following, the first data set is denoted as “current” and the second as “retrospective data set”.

The first representative survey in 2001 included 3,206, the second 2,637 persons who were surveyed by using a standardised questionnaire. This panel study consists of two independent samples. The average duration of the face-to-face interviews was 45 minutes. Despite the very long interviews, the questionnaire designed by us was generally perceived by the respondents as very interesting – in the course of the interview they became even more interested.

The questionnaire of the survey in 2001 is divided into three major sections. The first section refers to questions on the interest in and assessment of technology, the second deals with questions on political participation, and the third contains questions on the storage of radioactive waste and the use of nuclear energy. The interview begins with questions on information behaviour and its intensity, on value orientation, and on interest in politics. The first subject area of the questionnaire refers to the respondents *interest in technology* and their *perceptions of technology*, the environmental impacts of technology, views on nuclear energy, knowledge of the nuclear power phase-out by the German Federal Government and the assessment of it, as well as the importance of new technologies for the economic development in Germany.

The second section focuses on the willingness for and attitudes *towards political participation*. There are questions on the respondents confidence in different institutions, on the assessment of political participation in general, on licensing procedures for large industrial projects, and on various conditions of political participation in this context. Finally, there are questions on the participation of the population in the establishment of a final disposal site for nuclear waste. The third section contains special questions on the *storage of radioactive waste and the use of nuclear energy*. It starts with the credibility of different institutions and their information on the use of nuclear energy. Further topics of the questionnaire are: different alternatives for nuclear waste disposal (national vs. international storage concept), different criteria for final disposal and possible consequences of a final disposal site for nuclear waste, the assessment of existing final disposal sites, such as “Schacht Konrad” and “Gorleben”, and the role of municipalities regarding the possible establishment of a final disposal site for nuclear waste.⁴

4. Empirical Results

4.1 *Media Analysis*

The media analysis aims to record the intensity of the debate on a final disposal site and the response AkEnd has received in the media. The results of the content analysis by ITAS show that AkEnd was only selectively successful in attracting media attention in 2001 and 2002.

4.1.1 Low but constant final disposal coverage, largely without mention of AkEnd

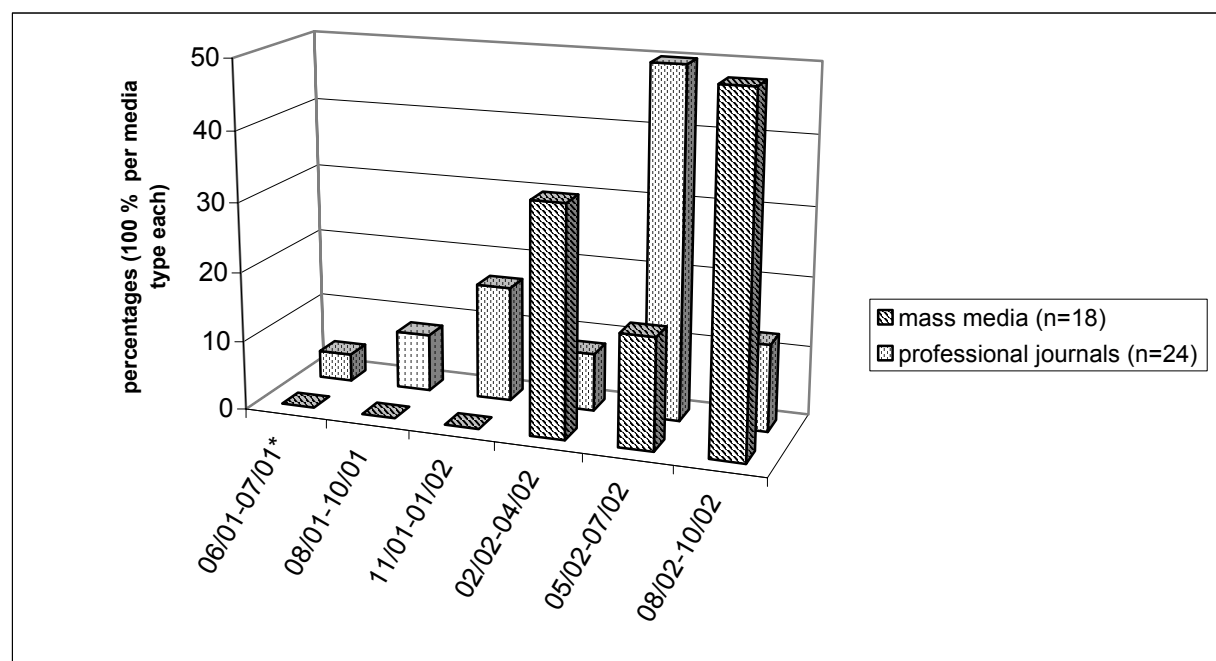
In the current investigation period (June 2001 to October 2002) a total of 3,720 issues of the twelve mass media included in the sample were analysed, and AkEnd was mentioned 18 times. The first mention of AkEnd was not until February 2002. Since the sample is representative for the German print media, this shows that the experts of AkEnd are only late (and only in a few cases) successful in being covered by the mass media. Only in the last year of the expert committee's work, a clear increase in media coverage can be observed. The row of hatched bars in the front of figure 1 indicates that during the first three analysis phases AkEnd did not appear at all in the media. In professional journals, however, a far more continuous media coverage could be observed which varied between two and twelve media mentions in the completely recorded quarters. The total number of mentions is 24 and exceeds the 18 mentions in the mass media. However, in the quarter with the highest number of mentions this strongly goes back to a special issue on final disposal published by one of the two nuclear-critical journals.

Special attention to AkEnd – so the interpretation of the sample on the nationwide reporting mass media – was only paid by a small group of the mass media, including the “Frankfurter Rundschau (FR)”, “tageszeitung”, and “Das Neue Deutschland”. While the FR can be assigned to the left-liberal opinion spectrum, the other two daily newspapers belong to the explicitly left political spectrum. From the regional subscription newspapers, only the “Elbe-Jeetzel-Zeitung” shows a special interest in AkEnd and its work; it appears in the region

⁴ Cf. Text of the questionnaire, in: Stolle, Martin 2002: “Ergebnisse der repräsentativen Bevölkerungsumfragen 2001/2002 und der regionalisierten telefonischen Befragung 2002”.

where the controversial final disposal project Gorleben is located. Politically rather conservative media, like "Frankfurter Allgemeine Zeitung" and the news magazine "Focus", however, do not report about AkEnd.

Fig. 1: Temporal distribution of media coverage with mentions of AkEnd: mass media vs. professional journals



ITAS media analysis (1/2003)

* only two calendar months, no complete quarter

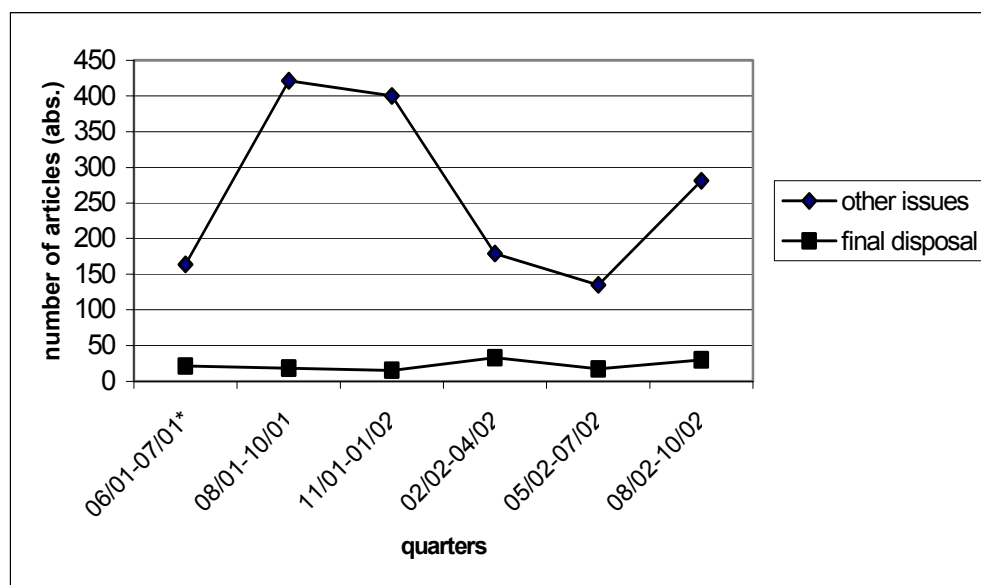
In absolute terms, the number of reports and mentions of AkEnd is not very high. How this is to be assessed can be examined by the orders of magnitude and the dynamics of mass media coverage on the topics of final disposal and nuclear energy. The limited number of reports with mentions of AkEnd is connected with the low intensity of media coverage regarding issues of the final disposal of nuclear waste. The average values of media coverage per quarter show that the coverage on final disposal sites only accounts for a small share of the media coverage on nuclear energy as a whole (Hocke-Bergler / Stolle 2003: 134-136). Out of 303 articles per quarter in the ITAS sample (without professional journals) on the topic of nuclear energy there are on average only 20 articles on final disposal.⁵ An analysis of the subtopics of

⁵ The calculation only refers to the five completely recorded quarters as of August 2001, and does not consider the months of June and July 2001.

the media coverage indicates that other subtopics (such as negotiations on the nuclear power phase-out or nuclear transports) predominate the media coverage with a much larger share.

However, the comparison with other nuclear topics shows that the media coverage of final disposal is a steady debate that is relatively uninfluenced by large attention cycles. The media attention to other nuclear topics, on the other hand, is subject to strong variations in attention (see fig. 2). Thus, the attention cycle of the coverage of final disposal strongly differs from that of the coverage of nuclear energy as a whole. The topic of final disposal of German radioactive waste is constantly covered by the media and shows neither clear downward drops nor upward swings.

Fig. 2: Mass media coverage on the topic of nuclear energy: "final disposal not mentioned" vs. "final disposal mentioned"

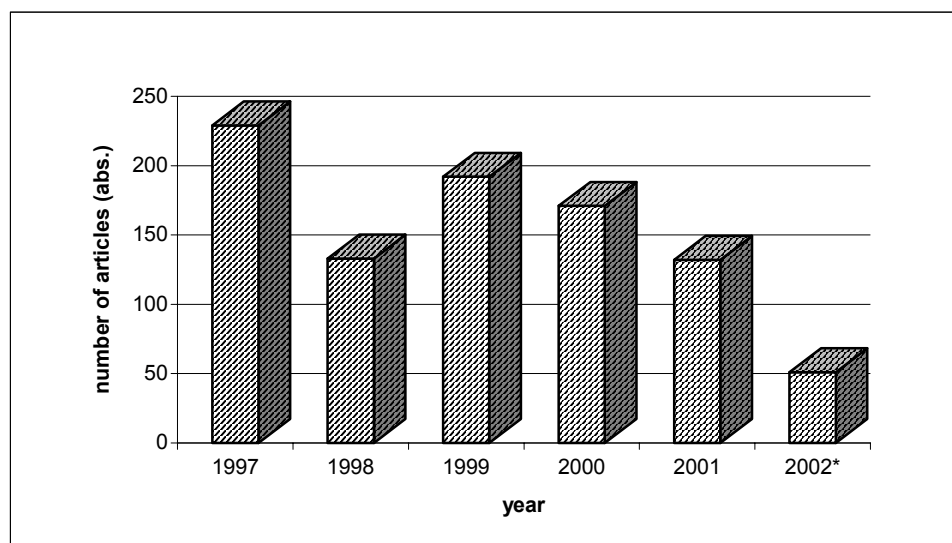


ITAS media analysis 1/2003 / mass media sample

* only two calendar months, no complete quarter

A comparison with the 1990s indicates that the importance of the media coverage on final disposal rather decreased and that the analysis of the media effects of AkEnd was carried out at a time when final disposal issues received only limited media attention. This was observed when comparing a selection of print media of the ITAS sample of the current data set with the intensities of the media coverage recorded before. The current data set 2001/2002 was therefore supplemented by a retrospective data set for the years 1997 to May 2001. Here, it turned out that the media coverage on final disposal in the analysis period 2001/2002 took place on a much lower level (see fig. 3). In a quantitative perspective, the probability for AkEnd of becoming a topic in the media coverage on final disposal was therefore very low.

Fig. 3: Intensity of the coverage of final disposal by year (FAZ, FR, taz + Spiegel)



Reduced ITAS retro-sample (4 out of 6) / Hocke-Bergler 2003

* no data for November and December 2002

The role of the collective action of experts for the mass media must also be considered in this context. The identification of the actors dominating the media coverage in the single articles leads to results confirmed by other authors (e.g. Kepplinger 1989, p. 171, or Schütz/Peters 2002, p. 42). Scientists and experts, as well as their specific expertise, play a comparatively marginal role, while the focus of mass media coverage is clearly on governmental organisations (see table 1). This is not surprising in so far as in mass media issues of nuclear policy are usually assigned to the political section which is usually given plenty of room compared to other sections (such as science pages). The final disposal problem was also hardly ever presented as an economic question. This was indicated not only by the analysis of the collective actors but also by the imperceptible response that the topic of final disposal received in the coverage by business papers.⁶ An interesting fact in this context is that experts have a better chance to receive media response in the coverage of final disposal than in the coverage of other nuclear topics. While experts were the dominant actors only in 2.2 percent of the articles on other nuclear topics, their share was about three times higher (6 percent) in the coverage of final disposal.

⁶ The two business papers “Financial Times Deutschland” and “Handelsblatt” accounted for less than five percent of the mass media coverage of final disposal (4.6 percent). The AkEnd was mentioned in one of the two newspapers.

Table 1: Dominant actors in the mass media coverage of final disposal (percentages)

	<i>Waste Disposal</i>	<i>Other nuclear energy issues</i>
Governmental organisations*	55.2	46.0
Protest groups etc.	11.9	13.5
Parties	11.2	13.5
Experts / scientists	6.0	2.2
Nuclear energy industry	4.5	17.0
Organised interest groups	3.7	4.8
Others	7.4	7.8
Total	100 (n=134)	100 (n=1,580)

ITAS sample mass media / Hocke-Bergler 2003

4.1.2 Sceptical but no openly tendentious media coverage

Evaluations on the tendency of media coverage were carried out both in the framework of the qualitative and quantitative content analysis. Because of the small number of articles with mentions of AkEnd, which had not been expected, the quantitative data presented at the beginning refer to the entire media coverage of final disposal. The results of the qualitative analysis, however, stronger refer to the media coverage with mentions of AkEnd. The tendency of the coverage was determined by analysing the heading and lead of each article. In a subsequent step, the “news stories” in a selection of articles were elaborated and interpreted.⁷

Openly tendentious media coverage – as shown by the results – is very rarely found in the subject of final disposal. Hardly more than every twentieth report in the mass media is to be classified as scandalising or dramatising (see table 2).⁸ However, neither the analysed tabloid “Bild” nor the news magazines “Focus” and “Spiegel” deal with final disposal topics on a considerable scale. These media are known for a more tendentious coverage than other media. A striking fact in this context is, that the professional journals are clearly ahead of the mass media regarding stronger forms of centring. Particularly with regard to forms of centring classified as “sceptical”, the share of specialist publications is almost twice as high as the share of the mass media (17.7 percent of the professional journals, and 8.9 percent of the mass media). However, this is largely attributed to the two nuclear-critical professional journals.

⁷ On the analysis of “news stories” see van Dijk 1985, p. 86, and van Dijk 1988.

The centring values of the analysed nuclear-friendly journal “Atomwirtschaft” are close to those of the mass media.

Table 2: Forms of centring (percentages)

<i>Centring</i>	<i>Mass media</i>	<i>Professional journals</i>
No detectable centring	45.5	26.15
Centring, but neutral	23.9	19.3
Formally balanced, but polarising	14.2	18.5
Sceptical	8.9	17.7
Scandalising or dramatising	5.2	6.7
	n = 134	n = 119

ITAS sample (12+3) / Hocke-Bergler 2003

The predominant centring patterns that are interesting from the perspective of political and social sciences are shown through analysis of reports published by the “Frankfurter Rundschau”, Berlin „Tagesspiegel“, and „Süddeutsche Zeitung“. The article by the “Frankfurter Rundschau” appeared at the beginning of 2002; the two other articles were published in October 2002 on the occasion of the third public workshop held by AkEnd as public final event in Berlin in October 2002. A conspicuous pattern is that the media implicitly only give a slim chance to the deliberative procedural elements regarded by AkEnd as constitutive for a comparative selection and evaluation of a site.

The coverage in the “Frankfurter Rundschau” (FR) at the beginning of 2002 belongs to the first group of articles with mentions of AkEnd (current data set). Between February and April 2002, the FR is the only print medium dealing with AkEnd in four reports during this phase (FR of 26.02.02, FR of 05.03.02, FR of 03.04.03, FR of 09.04.02). The national newspaper from Frankfurt on the one hand provides high-quality reports by looking at AkEnd from different perspectives and also by presenting committee’s own statements. In a commentary published early in April, however, it expressed its scepticism about the project of searching for a final disposal site as an alternative to Gorleben. The commentary placed on the environmental page starts with the population’s contradictory attitude regarding the acceptance of grassroots democratic decisions on a possible new final disposal project (fast

⁸ The classification was performed within the quantitative content analysis through a variable which determined the degree of centring in the heading and lead of an article. With a 5-degree scale it was differentiated between

installation on German ground, but far away). Then, the commentator concludes that a second Gorleben might easily arise.⁹ Subsequently, he emphasises the important role of AkEnd in the parliamentary term of that time, and underlines that the decision on a future final disposal site for German nuclear waste should be made “at least in consensus”.¹⁰ The realisation of the recommendations of AkEnd which were coming up at that time, and e.g. included innovative concepts for regional development as well as the establishment of “citizens’ forums” with advisory competence centres, would sound interesting. But it was still uncertain whether they would be able to really overcome the scepticism of the citizens (cf. Hocke-Bergler/Stolle 2003: 145-146).

“Where shall we put the nuclear waste?”¹¹ With this question in the subtitle, the Berlin daily newspaper “Tagesspiegel” takes up the basic problem AkEnd had to face in several years of work, and the results of which were presented at its closing workshop (Tagesspiegel of 21.10.02). However, this question adequate to the problem is negatively framed by the main heading and the second part of the subtitle: While the main heading refers to the fact that a common practice in dealing with nuclear waste had obviously established itself long ago (that is “living with the disposal site”)¹², the second part of the subtitle scandalises these circumstances: A disposal site for the hazardous nuclear waste is still to be found. The unsolved question of where to establish the disposal site is seen as a deficit attributed to the experts themselves and is not described as the result of a conflict which has caused dramatic tensions in domestic affairs within Germany for many years. The analysis of the article’s news story supports this interpretation and explains how the dilemmas of a search for a final disposal site are linked with journalistic scepticism to contradictory NIMBY interests of the population. The expected attitude of the population of being opposed to a disposal site for hazardous substances in their own region is naturalised just as the alleged extravagance of scientists aiming at an isolation period of 1 million years. The fact that AkEnd aims to integrate exactly these ideas in a productive way into bargaining processes gets lost.

“scandalising or dramatising centring” and “no detectable centring”.

⁹ “It doesn’t take much imagination to picture a ‘Gorleben II’ if somewhere in the Republic a geological formation of salt, granite, or clay is selected as a new final disposal site” [“Es braucht nicht viel Fantasie, um sich ein ‚Gorleben II‘ für den Fall vorzustellen, dass irgendwo in der Republik eine geologische Formation aus Salz, Granit oder Ton neu als Endlagerort herausgedeutet wird.”] (FR of 09.04.02, Paragraph 2)

¹⁰ [“wenigstens im Konsens”] (FR v. 09.04.02)

¹¹ [“Wo soll der Atommüll hin?”] (Tagesspiegel of 21.10.02)

¹² [“Leben mit dem Lager”] (Tagesspiegel of 21.10.02)

As the only newspaper in the media coverage with mentions of AkEnd analysed by ITAS¹³, the national newspaper “Süddeutsche Zeitung”, oriented between the left-liberal FR and the conservative FAZ, published an interview with an AkEnd member (SZ of 19.10.02). Here too, the NIMBY attitude of the population is quoted to report in detail on possible disadvantages of a deliberative policy with the people concerned. An analysis of the sequence of interview questions shows that the interviewer sticks to the stereotype that a constructive solution for the German disposal problem with participation of the public is not to be expected.

4.2 Survey in 2001

In the following, the results of the representative survey 2001 are presented with regard to the three topics storage of radioactive waste, political participation in the realisation of large industrial projects, and attitudes to the use of nuclear energy. For the first two topics univariate analyses are presented, and for the last topic multivariate analyses.

4.2.1 How is the problem of nuclear waste disposal perceived by the population?

One important aspect for the assessment of large industrial projects is the information available to the population and the source it comes from. The survey started with the respondents' confidence in information on the use of nuclear energy in Germany provided by different institutions.

Information on the use of nuclear waste is regarded as particularly reliable if it is provided by environmental research institutes (63.7 percent), environmental associations (56.3 percent), and citizens' action groups against nuclear energy (47.6 percent). About a quarter of the respondents has high confidence in the information supplied by journalists, the Federal Government, the unions and the churches. Very little confidence, however, is placed in information on nuclear energy from the opposition in the German Bundestag (Christian-Democrats and Liberals) and the nuclear industry.

¹³ This article was derived from an additional event-specific module of the media analysis which included print media that were not covered by the ITAS sample.

AkEnd as a commission of experts therefore acts in a thematic field in which information on the use of nuclear energy, on the one hand, is regarded as very reliable but also as very unreliable with regard to other sources of information. Here, a major integration task lies ahead of AkEnd or the actors in a new site selection procedure, since both the environmental research institutes and the nuclear industry must be involved in the site selection procedure.

Which time frame for establishing a final disposal site for nuclear waste is expected by the respondents? A majority of 66.9 percent of the people surveyed assumes that a final disposal site for nuclear waste will be established within the next ten years, while further 22.9 percent expect this to happen only within the next 30 years. That the final disposal of nuclear waste will only be accomplished by future generations who will probably have better technologies is expected by 10.2 percent of the respondents.

A clear majority of 80.6 percent of the respondents would not accept the establishment of a final disposal site for nuclear waste in the surrounding of their residence. This phenomenon is often quoted in literature and described as NIMBY syndrome (*not-in-my-backyard*). The same applies to a common final disposal site for nuclear waste of the European Community which might be established in Germany. Among the supporters of this proposed solution (N = 1,232) 38.1 percent favour an establishment of the final disposal site in Germany, 41.7 percent are against, and 20.2 percent of the respondents are undecided.

Regarding the question whether one central or several decentralised final disposal sites should be established, 45.5 percent of the respondents are in favour of a central final disposal site. 33.7 percent prefer several small final disposal sites, and one fifth of the people surveyed has no clear opinion concerning this question.

A further question included nine different criteria for the final disposal of nuclear waste which were to be assessed by the respondents in view of their importance. The results presented in table 3 are sorted by the average values.

Most striking are the relatively high percentages throughout the first column (“high importance”). Beginning with the safety standards for a final disposal site, followed by

ensuring the protection of the environment, and prevention of the contamination of the environment by radioactivity, each of these three criteria combines more than 90 percent in the assessment of the respondents.

87.6 percent of the respondents also attach great importance to the consideration of the interests of residents. That a final disposal site should be located in a sparsely populated area was considered as a very important criterion by 86.7 percent, and ensuring the removability of radioactive waste was seen as very important by 81.9 percent of the respondents.

The safe enclosure of radioactive waste in a mine is considered to be of high or very high importance by 77.5 percent of the persons surveyed. However, a rather medium importance is attached to the last two criteria in the table: the voluntariness of the region regarding the establishment of a final disposal site for nuclear waste, and the criterion that the development costs must keep within reasonable bounds.

A comparison of the average values in table 3 shows that with the used seven-stage scale the first seven average values are in an interval from 6.15 to 6.73. This skew distribution indicates that the majority of the respondents attaches very high importance to all seven criteria, while only a minority attaches very low importance to them.

Table 3: The importance of different criteria for the final disposal of nuclear waste in Germany (percentages; N = 3,206)¹⁴

	High importance categories (6,7)	Medium importance categories (3,4,5)	Low importance categories (1,2)	Average value
The safety standards for a final disposal site for nuclear waste have to be particularly strict	93.9	5.4	0.7	6.73
The protection of the environment must be sufficiently guaranteed	93.5	5.8	0.7	6.70
Contamination of the environment by radioactivity must be prevented	92.6	6.4	1.0	6.68
The interests of residents must be comprehensively considered	87.6	11.5	0.9	6.50
A final disposal site for nuclear waste must be located in a sparsely populated area	86.7	12.2	1.1	6.49
The removability of the nuclear waste must be ensured to allow the subsequent correction of faults	81.9	16.1	2.0	6.29
The radioactive waste must be safely locked into a mine and the surrounding rocks	77.5	19.3	3.2	6.15
The establishment of a final disposal site for nuclear waste must be based on the voluntariness of the region	69.1	26.5	4.4	5.87
The development and building costs must be reasonable	56.6	30.1	13.3	5.26

Source: ITAS survey 2001 / Stolle

A further question looks at the consequences associated with the establishment of a final disposal site for nuclear waste. Here, the respondents were to estimate subjective probabilities of various expected consequences that may result from a final disposal site.

A comparison of the respective average values in table 4 for these eight subjective probability estimations shows that for six of these consequences the value is higher than 0.5. Assuming that the occurrence of a consequence with the value of 1.0 can be considered as certain, a relatively high subjective probability is attributed to these first six consequences in the table.

¹⁴ The minimum of the scale is 1 for „very low importance“ and the maximum is 7 for „very high importance“ – the categories in between are *not* defined. The calculation of the average value is based on this scale range.

Table 4: Subjective probability estimates (p) for possible consequences of the final disposal of nuclear waste (percentages; N = 3,206)¹⁵

What is your estimate for the probability that ...	Probably	Neither probably / nor improbably	Improbably	Average value p
... the region where the final disposal site is located will be substantially affected by the surrounding circumstances such as transport and safety measures?	68.4	20.1	11.5	0.68
... the environment will be exposed to considerable contamination through a final disposal site for nuclear waste?	56.7	21.6	21.7	0.62
... the radioactivity emanating from a final repository endangers the health of the population?	54.7	21.1	24.2	0.61
... new jobs will be created through a final disposal site for nuclear waste?	49.3	24.6	26.1	0.56
... a final disposal site for nuclear waste in Germany will prevent the construction of further interim storage facilities in nuclear power plants?	45.5	25.1	29.4	0.55
... the nuclear waste problem will be solved by the construction of a final disposal site?	46.8	20.6	32.6	0.54
... the number of transports in Castor casks will be reduced?	36.0	24.1	39.9	0.48
... strong conflicts such as in Gorleben will be avoided?	26.5	25.1	48.4	0.42

Source: ITAS survey 2001 / Stolle

Compared to the others, the first three consequences have a very high subjective probability value. The respondents particularly assume that the final disposal region will be considerably affected by transport and safety measures (average value: .68), that the environment will be exposed to considerable radioactive contamination through a final disposal site for nuclear waste (average value: .62), and finally, that the radioactivity emanating from a final disposal site endangers the health of the population (average value: .61). A bit lower are the average values for the following three consequences: New jobs will be created through the

¹⁵ The subjective probability estimates were determined with a five-step scale. Each category was conceptually defined. The scale minimum is 0 for „very improbably“, and the maximum has the value 1 for „very probably“. The calculation of the average value is based on this scale range.

establishment of a final disposal site ($p = .56$), a final disposal site will prevent the construction of further interim storage facilities in nuclear power plants ($p = .55$), and the establishment of a final disposal site will solve the problem of nuclear waste disposal ($p = .54$). The lowest average values of .48 and .42 are shown for the two consequences of a reduction of the number of transports with Castor casks and regarding the prevention of strong conflicts, such as in Gorleben. This means that, on average, the occurrence of these two consequences is not seen as very likely by the majority of the respondents.

4.2.2 Political participation

The involvement of the population at different levels of the selection process for a final disposal site is a substantial element of the proposal prepared by AkEnd. For this reason, some questions on political participation were included in the survey.

Regarding conflicts that might arise from the introduction of new technologies, 72.5 percent of respondents support an involvement of the citizens in new forms of participation, such as the introduction of round tables for resolving conflicts. In a further question, examples of various large industrial projects were given, and the people surveyed should indicate for each case whether they considered participation of citizens important for the individual projects. An involvement in the decision on a final disposal site for nuclear waste is seen as “very important” or “important” by 87 percent of respondents. In general, participation of the population is predominantly assessed as an important factor for all types of industrial plants listed in table 5. Even for the establishment of a car factory this is still considered “important” or “very important” by 66.8 percent of the people surveyed. Thus, high importance is attached to political participation in the establishment of large industrial projects, and this particularly applies to the establishment of a final disposal site for nuclear waste.

Table 5: Relevance of political participation in the decision on the establishment of large industrial plants (percentages; N = 3,206)¹⁶

	Very important	Important	Rather unimportant	Very unimportant	Average value
Final disposal site for nuclear waste	73.3	13.7	5.4	7.7	1.47
Waste incineration plant	63.8	25.0	6.9	4.3	1.52
Nuclear power plant	67.5	16.1	9.5	7.0	1.56
Chemical processing plant	61.1	24.0	9.6	5.4	1.59
Oil refinery	48.4	35.5	11.7	4.4	1.72
Genetic engineering plant	42.0	31.0	19.7	7.3	1.92
Hydroelectric power plant	36.0	38.8	20.3	4.9	1.94
Wind park	31.5	36.6	25.5	6.4	2.07
Car factory	28.8	38.0	25.8	7.4	2.12

Source: ITAS survey 2001 / Stolle

A factor analysis clearly shows that the listed large industrial plants are rated very differently by the respondents. For hydroelectric power plants, wind parks and car factories other criteria are considered important than for the remaining large industrial plants listed at the beginning of the table. It can be assumed that other, maybe more risky consequences are associated with a final disposal site for nuclear waste, a waste incineration plant, a nuclear power plant, a chemical processing plant, an oil refinery, and a genetic engineering plant than with a hydroelectric power plant, a wind park, and a car factory. In the view of the respondents, the approval of the people living in the neighbourhood is essential for the establishment of a new large industrial plant. Furthermore, it can be assumed that in the assessment of the six mentioned plant types risk aspects or risk estimations are of higher significance than in relation to the three remaining technological projects.

Political participation in the narrower sense was surveyed with two questions: on the one hand they recorded different forms of political activities; on the other hand the respondents should assess the perceived influence of the twelve listed political activities. The results of these two questions are shown in table 6.

¹⁶ The scale minimum is 1 for „very important“, and the maximum has the value 4 for „very unimportant“ – all categories in between are defined. The calculation of the average value is based on this scale range.

Table 6: Political participation: The perceived influence of political activities, and their implementation (percentages; N = 3,206)¹⁷

Influence through ...	not at all (1, 2)	medium (3, 4, 5)	very strong (6, 7)	average value of the scale	<i>actually practiced</i>
participation in parliamentary elections	16.3	51.9	31.8	4.5	66.4
cooperation in civic action groups	16.9	62.8	20.4	4.1	11.8
getting up petitions	19.7	57.5	22.9	4.1	51.5
working for a political party	18.8	60.2	21.0	4.1	6.7
public discussions	22.9	62.7	14.4	3.8	28.0
participation in authorised demonstrations	32.7	56.5	10.8	3.4	22.6
participation in licensing procedures	34.3	54.8	10.9	3.4	3.6
Voting for another party in protest	46.4	40.3	13.3	3.1	21.6
not voting in elections	58.3	33.3	8.4	2.6	19.4
unauthorised demonstrations	55.0	40.4	4.6	2.6	5.7
participation in traffic blockades	57.4	37.1	5.5	2.6	2.5
house and factory occupations	68.2	28.6	3.2	2.2	1.1

Source: ITAS survey 2001 / Stolle

A majority of 66.4 percent of the people surveyed has participated in past parliamentary elections (cf. last column of table 6), and in comparison to all other activities listed in the table the highest perceived influence is attributed to this form of political activity – here, the empirical average is 4.5.

Besides the participation in elections, another majority of 51.5 percent has already signed a petition. Far lower percentages of respondents are recorded for the participation in public discussions (28 percent), and to the participation in authorised demonstrations (22.6 percent). Worth mentioning in this context are the 21.6 percent of respondents who have already voted for a different party in protest, as well as those who obviously have not yet taken part in any election, though voting is one of the basic rights in a democracy. The table also shows that in the past only a minority of 3.6 percent of respondents had the opportunity to participate in a licensing procedure for a technological project.

¹⁷ The scale minimum is 1 for „not at all“, and the maximum has the value 7 for „very strong“ – categories in between are *not* defined. The calculation of the average value is based on this scale range.

In the opinion of the respondents, a strong political influence can be achieved mainly by four political actions: participation in parliamentary elections, cooperation in citizens' action groups, getting up petitions, and working for a political party. On the other hand, non-participation in an election, participation in unauthorised demonstrations, participation in traffic blockades, and house and factory occupations are considered to be of very low political influence.

A striking fact in this context is that, generally, a very high political influence is attributed to parliamentary elections. However, two contrary aspects are important here. On the one hand, one out of five respondents has already voted for another party in protest, and on the other hand almost every fifth person has never gone to vote before. These results indicate two different groups: first, the protest voters who actively utilise their democratic rights, and second, the "refuseniks" who renounce any democratic participation.

Particularly with regard to political participation in the search for a final disposal site for radioactive waste it will be indispensable to individually respond to the different groups of voters mentioned above.

4.2.3 Attitudes to the use of nuclear energy

The investigation goes beyond the univariate results of the survey and uses linear regression models to specify an explanatory approach to the population's attitude to the topic of nuclear waste disposal.

In terms of content, it is examined how far the final disposal of radioactive waste is understood as an independent problem area. However, it is also possible to take the contrary view, i.e. that the final disposal of nuclear waste is always understood as a sub-topic of the use of nuclear energy.

The results of the multivariate regression analyses indicate that the assessment of final disposal sites is not independent of the assessment of the use of nuclear energy (cf. Stolle 2002: 72-77; Hocke-Bergler / Stolle 2003: 75-80). This interpretation is supported by the

bivariate correlation and regression coefficients between the attitude to the use of nuclear energy and the assessment of Schacht Konrad (.41**), as well as between the attitude to the use of nuclear energy and the assessment of the final disposal site Gorleben (.39**).

Thus, the topic of nuclear waste disposal can only be interpreted as a sub-topic of the use of nuclear energy.

The simple use of the dependent variable ‘attitude to the use of nuclear energy’ in the regression models was unsatisfactory. Two different scales were developed instead in order to reflect optimistic and pessimistic attitudes to nuclear energy. Both scales are now used as dependent variables in a linear regression.¹⁸

The optimism or pessimism towards nuclear energy is illustrated in table 7 through the scales of the concrete and diffuse effects of final disposal and the scales of a positive or negative perception of technology (vgl. Stolle 2002a: 140-149). Furthermore, the analysis includes the following items: importance of nuclear technology for the economic development in Germany, information about nuclear energy provided by research centres, as well as environmental impacts of technology with the example of radioactive radiation.

Besides a positive attitude to technology (.15**) and the concrete consequences of the final disposal of nuclear waste (.14**), the importance of nuclear technology for the economic development is a main factor for the optimism towards nuclear energy – here, the multivariate regression coefficient is .36** (cf. table 7). The diffuse consequences of the final disposal of nuclear waste and radioactive radiation as an environmental impact of technology, as well as a negative attitude to technology have all negative regression coefficients. In the presented regression model, a relatively high explained variance of 41 percent was obtained.

¹⁸ For details on scale development, see Stolle, 2002: pp. 48-61.

Table 7: Multivariate linear regressions with the two dependent variables optimism and pessimism towards nuclear energy (N = 3,206)

	Optimism towards nuclear energy	Pessimism towards nuclear energy
<i>Scales on the consequences of final disposal:</i>		
Concrete effects of final disposal	.14**	-.02
Diffuse effects of final disposal	-.11**	.26**
<i>Scales of the perception of technology:</i>		
Positive perception of technology (technology optimism)	.15**	.11**
Negative perception of technology (technology pessimism)	-.09**	.08**
Importance of nuclear technology for the economic development in Germany	.36**	-.22**
Information about nuclear energy: research centres	.12**	-.04*
Environmental impacts of technology: radioactive radiation	-.11**	.22**
Explained variance of the regression model - R ²	.41	.29

Source: ITAS survey 2001 / Stolle

Different results are obtained for the pessimism towards nuclear energy. Here, radioactive radiation as an environmental impact of technology (.22**) and the diffuse consequences of the final disposal of nuclear waste (.26**) are very important factors. The concrete consequences of final disposal and the reliability of information on nuclear energy provided by research centres do not play a major role in this model, while the importance of nuclear technology for the economic development shows a clearly negative regression coefficient of -.22** in relation to the dependent variable. The regression model has an explained variance of 29 percent.

The differentiation of the dependent variable by optimism and pessimism towards nuclear energy allows to show that, regarding the issue of final disposal of nuclear waste, it is important to deal with the two underlying groups of opponents and supporters of nuclear energy in a different way.

5. Conclusion

The block of decision-making impeding a successful search for alternative sites for the disposal of nuclear waste in Germany also was not resolved by the work of the expert committee AkEnd in the last parliamentary term (from 1998 to 2002). Important stakeholders from politics (such as the Lower Saxony state government and the Christian Democratic politics) and from the energy industry could not be won over to a new comparative site selection. Therefore, it is still open whether the responsible Federal Ministry of the Environment will succeed in initiating a new comparative site selection process, as proposed by AkEnd, through the establishment of a negotiating group “Nukleares Endlager” (nuclear disposal site) and the subsequent politically binding decision on a new selection process. Tension between the two ruling parties also seems to hinder this attempt (cf. Vorholz 2003). Classic power-political disputes following the old pattern of the controversy about nuclear energy will thus continue to determine the field of final disposal policy. The agreement on a participation-friendly process proposal for a new criteria-based attempt by the experts of AkEnd who differ in their views on nuclear energy did not open up a perspective through which a reasonable civil-society-oriented solution of the nuclear waste problem becomes likely – a problem which has to be solved irrespective of the German nuclear power phase-out.

The results from the survey in 2001 and the empirical media analysis indicate two framework conditions which – according to our theory – contribute to a further delay of the decision on the disposal of German nuclear waste. Neither the mass media with their reporting nor the public opinion help to pressurise the decision-makers to pursue constructive approaches.

The very cautious and policy-centred reporting by the mass media, which shows no significant increases in the attention to the topic of “final disposal”, made AkEnd become one among many actors within a nuclear sub-topic. The “news stories” of the articles do not report on the significance of the problem of “final disposal” or the chances of a new attempt but only reproduce the political disputes of the last 20 years on a slightly changed level. Through their agenda setting, the mass media therefore do not put public pressure on the stakeholders and decision-makers to act constructively with regard to the existing proposal for a selection

procedure by AkEnd and thus to prepare the ground for a sound political solution of the final disposal problem in the long term.

The public opinion also does not contribute to increase the pressure on the decision-makers. On the one hand, the attitudes and expectations regarding problems of the final disposal of nuclear waste, of political participation, and of societal conflict resolution are contradictory, which gives stakeholders the opportunity to take advantage of these disagreements in their lobbying. On the other hand, important attitudes referring to the final disposal are still arranged along the cleavage between supporters and opponents of nuclear energy. Thus, the serious disposal and storage problems are not understood in their own importance but are continuously classified as a sub-problem of the civil use of nuclear energy. The surveys show that still far more than 45 percent of the population has a negative attitude towards the use of nuclear energy. They face two groups of approximately the same size – the supporters of nuclear energy and the undecided people – each of them comprising about a quarter of the population.¹⁹ The fact that the split between opponents and supporters of nuclear energy also has a decisive influence on the attitudes to the final disposal of nuclear waste could also be proved by multivariate regression analysis.

It can be concluded that AkEnd successfully fulfils its task to develop a criteria-based proposal for a comparative site selection procedure. However, the expert committee seems to be less successful in mobilising the interested public, including decision-makers in political parties and in the energy industry. These groups can refer to contradictory trends in the public opinion: On the one hand, a final disposal site for radioactive waste shall be realised as soon as possible; on the other hand, a final disposal site shall be established far away, but not outside Germany. To resolve these contradictions, the collective action of experts has to vary in its response to supporters and opponents of nuclear energy and take their differing patterns of attitude to the final disposal of nuclear waste seriously, in order to subsequently win the two groups over as supporters of a deliberative solution of the final disposal problem.

¹⁹ In 2001 and 2002, the percentages of the opponents of nuclear energy fluctuated between 46.2 and 48.3 percent. Supporters of nuclear energy were 28.2 percent in 2001 and 26.0 percent in 2002. The percentage of undecided persons was 25.6 percent in 2001 and 25.7 percent in 2002 (weighted data set / ITAS survey in 2001 and survey in 2002).

References

- Andersson, Kjell (ed.) (2003): VALues in Decisions On Risk. VALDOR 2003 Proceedings Stockholm June 9-13, 2003, 533 p.
- AkEnd (2002): Auswahlverfahren für Endlagerstandorte. Empfehlungen des AkEnd (Arbeitskreis Auswahlverfahren Endlagerstandorte), Cologne, December 2002, 260 p. (download: www.akend.de)
- Bechmann, Gotthard / Hronszky, Imre (eds.) (2003): Expertise and Its Interfaces. The Tense Relationship of Science and Politics, Berlin: edition sigma
- Dally, Andreas (ed.) (2003a): Atommüll und sozialer Friede. Strategien der Standortsuche für nukleare Endlager. Dokumentation der Tagung der Evangelischen Akademie Loccum vom 7. bis 9. Februar 2003, Rehburg-Loccum (Loccum Protocol No. 5/03)
- Dally, Andreas (ed.) (2003): Der Streit um Gorleben. Weiß die Mehrheit, was sie will? Dokumentation der Tagung der Evangelischen Akademie Loccum vom 21. bis zum 23. Januar 2000, Rehburg-Loccum (Loccum Protocols 2/00)
- van Dijk, Teun A. (1985): Structures of News in the Press, in: Discourse and Communication, Teun A. van Dijk (ed.), Berlin et al.: de Gruyter, pp. 69-93
- van Dijk, Teun A. (1988): News Analysis, Hillsdale et al.: Lawrence Erlbaum Associates
- Dunlap, Riley E. / Kraft, Michael / Rosa, Eugene A. (1993): Public Reactions to Nuclear Waste: Citizens' Views of Respository Siting, Durham: Duke University Press Durham
- Ferree, Myra Marx / Gamson, William / Gerhards, Jürgen / Rucht, Dieter (2002): Four Models of the Public Sphere in Modern Democracies, in: Theory and Society, 31, pp. 289-324
- Hocke-Bergler, Peter / Stolle, Martin (2003): Ergebnisse der Bevölkerungsumfragen und der Medienanalyse zum Thema Endlagerung radioaktiver Abfälle. Endbericht im Rahmen der fachlichen Unterstützung des AkEnd durch das Institut für Technikfolgenabschätzung und Systemanalyse (ITAS), Karlsruhe, 2 Volumes: Vol. 1: Final Report: 186 p., Vol. 2: Appendices, (download: www.akend.de/projekte/pdf/berichtsband.pdf)
- Hurrelmann, Achim / Liebsch, Katharina / Nullmeier, Frank (2002): Wie ist argumentative Entscheidungsfindung möglich? Deliberation in Versammlungen und Internetforen, in: Leviathan 30/4 (2003), pp. 544-664
- Ipsen, Detlev (2003): Public Participation and Regional Development at a Nuclear Waste Disposal Site, in: Andersson 2003, pp. 316-325
- Jentsch, Gerhard (2003): Die Ergebnisse des AkEnd: Neue Wege zur Endlagerung radioaktiver Abfälle, in: Dally 2003a, pp. 25-72
- Kepplinger, Mathias (1989): Künstliche Horizonte. Folgen, Darstellung und Akzeptanz von Technik in der Bundesrepublik. Frankfurt a. M.: Campus Verlag
- Kriesi, Hanspeter (2003): Strategische politische Kommunikation: Bedingungen und Chancen der Mobilisierung öffentlicher Meinung im internationalen Vergleich, in: Esser, Frank / Pfetsch, Barbara (eds.), Politische Kommunikation im internationalen Vergleich, Wiesbaden: Westdeutscher Verlag, pp. 208-239
- Lennartz, Hans-Albert / Mussel, Christine (2002): Beteiligung der Öffentlichkeit bei der Standortauswahl für die Endlagerung radioaktiver Abfälle, Düsseldorf (Wibera No. 84 580 300)
- Mez, Lutz (2001): Der deutsche Weg zum Ausstieg aus der Atomenergie – im Konsens zu einer Quote für Atomstrom, in: Gourd, Andrea / Noetzel, Thomas (eds.) (2001): Zukunft der Demokratie in Deutschland, Opladen: Leske+Budrich, pp. 416-432

National Research Council / Committee on Disposition of High-Level Radioactive Waste Through Geological Isolation / Board on Radioactive Waste Management Division on Earth and Life Studies (2001): Disposition of High-Level Waste and Spent Nuclear Fuel. The Continuing Societal and Technical Challenges, Washington, D.C. (USA): National Academy Press

Raschke, Joachim (2001): Die Zukunft der Grünen, Frankfurt a. M.: Campus

Renneberg, Wolfgang (2001): Perspektiven der Entsorgung, in: Deutscher Atomrechtstag 2000, Fritz Ossenbühl (ed.), Baden-Baden: Nomos, pp. 145-148

Rüdig, Wolfgang (2000): Phasing Out Nuclear Energy in Germany, in: German Politics 9/3 (2000), pp. 43-79

Schütz, Holger / Peters, Hans Peter (2002): Risiken aus der Perspektive von Wissenschaft, Medien und Öffentlichkeit, in: Aus Politik und Zeitgeschichte B10-11 (2002), pp. 40-45

Stolle, Martin (2002): Ergebnisse der repräsentativen Bevölkerungsumfragen 2001/2002 und der regionalisierten telefonischen Befragung 2002. Ergänzender Bericht im Rahmen der fachlichen Unterstützung des AkEnd durch das Institut für Technikfolgenabschätzung und Systemanalyse im Forschungszentrum Karlsruhe

Stolle, Martin (2002a): Beeinflusst das Interesse für Technik die Einstellung zur Entsorgung radioaktiver Abfälle? In: Technikfolgenabschätzung – Theorie und Praxis, No. 3/4, 11. Vol., November, pp. 140-149

Sundqvist, Göran (2002): The Bedrock of Opinion. Science, Technology and Society in the Siting of High-Level Nuclear Waste, Dordrecht: Kluwer Academic Publishers

Weingart, Peter (2003): Wissenschaftssoziologie, Bielefeld: Transcript-Verlag

Vorholz, Fritz (2003): Ende der trügerischen Ruhe, in: Die Zeit of 26.6.03, p. 19

Weßler, Hartmut (2002): Reden über Streit. Theoretische Überlegungen zur politischen Konfliktkommunikation in der Mediengesellschaft, in: Politische Akteure in der Mediendemokratie. Politiker in den Fesseln der Medien?, Schatz, Heribert et al. (eds.), Wiesbaden: Westdeutscher Verlag, pp. 189-201