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Danish Perspectives on Transboundary Environmental Risks: An Example from Copenhagen

by

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Abstract

This article examines the perceptions of a randomly selected number of Copenhagen inhabitants towards different forms of transboundary environmental risks: the Barsebäck nuclear power plant in Sweden and more general East Europe's environmental problems. The study, based on a random telephone sample of 100 inhabitants and interviews with policy makers, arrives at the following conclusions: the respondents were more concerned about local environmental problems than transboundary ones while policy makers were not so worried about local problems; a large majority of the respondents were willing to give environmental aid to Eastern Europe for both self interest and altruistic reasons; and finally, when they were probed, both the respondents and the policy makers associated the risks posed by the Barsebäck plant with a possible nuclear accident rather than a radioactive leakage.

1. Introduction

This article examines and discusses the views and degree of concern of Copenhagen's inhabitants towards two different types of transboundary risks (the Barsebäck nuclear power plant in Sweden, located only twenty kilometers away from Copenhagen, and East Europe's acid rain and nuclear power problems). These risks affect Copenhagen very differently: the nuclear power plant at Barsebäck, which is considered to be one of the safest in the world, has a "dread" or "catastrophic potential" factor attached to it; acid rain, originating mainly from Eastern Europe and falling over Copenhagen and the rest of Denmark, has an environmental risk factor (death to trees) attached to it. Of special interest to this study is, firstly, whether the respondents were concerned about the risks posed by the Barsebäck plant and the risks from East Europe's environmental problems and, secondly, whether the inhabitants of Copenhagen viewed catastrophic risk associated with Barsebäck to be greater than environmental risk associated with Eastern Europe, and if so why. To help answer these questions both qualitative and quantitative methodologies were used, and theoretical concepts from the risk literature were employed.

2. Background

The background section has been divided into two parts. Firstly, we give a brief historical overview of the Danish-Swedish relations concerning Barsebäck. Secondly, we discuss Danish environmental aid policy from the period around the Chernobyl accident to the present.

2.1 The Barsebäck plant

The Barsebäck nuclear power plant has been a source of political and public dispute since its two reactors first came on line in the mid-1970's. The plant was the focus of domestic outrage during the 1976 "nuclear elections", and it was the

site of large demonstrations during the time of 1980 Swedish nuclear referendum. The Danes have been unhappy with the plant at least since the late-1970s, even passing a bill in parliament in 1986 calling for a complete closure of the Barsebäck plant (Löfstedt 1994). In 1988, due to Danish pressure, the then Swedish Energy and Environmental Minister, Birgitta Dahl of the Social Democratic Party, forced a bill through parliament calling for the shut-down of two nuclear reactors by 1996, one of which would be at the Barsebäck site. Only three years later this decision was revoked due to political opposition both within the Social Democratic Government but also from the Liberal and Conservative parties and the powerful trade-unions, traditionally allies with the Social Democrats. This decision caused concern among the Danish policy makers and as a result Swedish-Danish relations over the plant further deteriorated in the early 1990s.

In the falls of 1992 and 1993 two incidents at Barsebäck led to widespread outcry among the Danish population. Following the first incident in the fall of 1992, which was caused by insulation blocking up the reactor's water cooling system, the Danes argued against the reactors being reopened. They felt they should never have been built in the first place, since the plant not only put Sweden's third largest city, Malmö, at risk, but also the Danish capital with its 1.3 million inhabitants. These arguments were not heeded, however, and the reactors went back on line in January 1993. At that point the Danish Interior Minister, Thor Pedersen, went so far as to suggest that the provinces which Sweden had captured from Denmark in 1658 (including Skåne where the Barsebäck plant is located) should be retaken through military means. Carl Bildt, the Swedish Prime Minister, felt that this statement was extremely ill advised as it threatened Scandinavian cooperation in addition to being ridiculous (Dagens Nyheter 1993a). The result was a conflict, more precisely a "war of humour", between Sweden and Denmark. Sweden's Defence Minister, Anders Björk, threatened to attack the Danes with fermented herring, and journalists from the Danish newspaper Ekstra Bladet dumped old smelly cheese at the Barsebäck plant (Dagens Nyheter 1993b). This negative Danish reaction was to be expected, considering that 83 percent of Copenhagen's population is against nuclear power (70 percent in the rest of

Denmark) and that 82 percent of the Danes in 1992 wanted their government to put pressure on Sweden to close the plant permanently (Hellberg 1992).

The second incident in the fall of 1993, caused by the containment structure around the two reactors springing a leak, made the Danish press once again vociferous, (during a one week period more than 250 articles were published on the issue) calling for the closure of Barsebäck (Löfstedt 1994). The Mayor of Copenhagen, Jens Kramer Mikkelsen, told his counterpart in Malmö that the plant should be closed, and the Danish Interior Minister, Birgitte Weiss, informed the Swedish Energy Minister that the 1986 parliamentary decision was still valid (Weiss 1993).

Based on this overview it can be hypothesized that the Danish public as well as Denmark's policy makers and mass media are very much concerned about the safety issues associated with the Barsebäck plant. This seems a very plausible hypothesis since a large majority of the Danes are opposed to nuclear power generally. In fact, Denmark has itself not opted for the nuclear option.

2.2 Danish East European Environmental Policy

The most important transboundary environmental pollutants affecting Denmark are nutrients, radioactive substances, oil as well as metals and persistent organic substances (various PCBs) (Danish Ministry of the Environment 1988). Denmark has for several years advocated pollution reduction within international regimes dealing with such matters, such as the so-called Helsinki Convention and the London Dumping Convention (Ringius 1992). However, although it since the early 1980s has managed to reduce its own sulphur emissions considerably, the 'import' of sulphur from outside Denmark has not been reduced (Danish Ministry of the Environment 1993b). International standards and regulations are imperative, but they cannot prevent all transboundary pollutants from reaching Denmark. The recent political changes in East Europe have provided Denmark with new opportunities for reducing transboundary pollution.

In a course of a few years, Denmark has significantly stepped up its

commitment to protecting the environment in Eastern Europe and has recently embarked upon what at present probably is the most ambitious environmental programme for that region (Ringius et al 1994). Environmental aid to Eastern Europe is one component of a comprehensive environmental and disaster aid package from 1993. It is the government's aim to annually increase the environmental and disaster aid in the period from 1993 to 2002. In 2002, total expenditures will amount to approximately DKK 6 billion, equal to 0.5 percent of GDP (Danish Ministry of Finance 1993). One half of this amount will be spent on environmental aid, while the other will be spent on disaster aid. Approximately one half of the amount available for environmental aid will be spent on environmental problems in Eastern Europe. It is consequently possible that no less than DKK 1.5 billion (Danish Ministry of Finance 1993) will be spent on environmental aid to Eastern Europe as compared to DKK 264 million in 1994. According to the Ministry of the Environment, DKK 194 million will in 1994 be available under the Danish Environmental Aid Scheme, while DKK 70 million will come from energy related programmes administered by the Danish Ministry of Energy. Since 1991, when Denmark first began helping with the restoration of the environment in Eastern Europe, Denmark's financial contribution thus has been increasing annually.[1]

The environmental problems that the Danish government has been most concerned about include the following: low energy efficiency and low environmental standards for coal based power plants and the heavy industry; safety problems in nuclear power plants; discharge of waste water and resultant pollution of large portion of surface waters, problems stemming from too little attention to the proper handling of toxic wastes; and, finally, accumulation of pesticides in agricultural soils and the environmental effects of testing nuclear and bacteriological weapons (Danish Ministry of the Environment 1993a).

In 1991, under the Danish Environmental Aid Scheme, the government committed DKK 86.9 million for Eastern Europe. This money was allocated in the

[1] In 1990, DKK 6.5 million were available for environmental aid to Eastern Europe.

following fashion: Poland (48 percent), Czechoslovakia (19 percent), Hungary (12 percent), Estonia (5 percent), Latvia (2 percent), and Lithuania (4 percent). Rumania, the former Yugoslavia, Albania, and Bulgaria were given a low priority because they contributed little of the transboundary pollution reaching Denmark. In 1992, with a budget of DKK 171.2 million, government committed resources as follows: Poland (47 percent), Russia (12 percent), Czechoslovakia (10 percent), Hungary (8 percent), Estonia (7 percent), Latvia (3 percent), and Lithuania (8 percent). In the 1993 budget of 188.04 million some changes were made: Poland (42 percent), Russia (14 percent), Czechoslovakia (12 percent), Hungary (3 percent), Estonia (4 percent), Latvia (5 percent), and Lithuania (5 percent) (Danish Environmental Ministry 1994). Priority was given to the Baltic region, projects on airborne pollution from some central European countries, and projects that had a good chance of back-up investments.

In conclusion, based on the above discussion the Danish public has received a great deal of information concerning the two risk issues. In order to compare them along similar guidelines we use the theory of risk perception described in the next section.

3. Risk Perception

Risk perception is a field which has gained wide attention in the last two decades, following the seminal article by Starr (Starr 1969) emphasizing the difference between voluntary and involuntary risk (expressed preferences). Since then, psychologists have entered the field of risk perception and have developed a methodology to give quantitative representations of people's perceptions of risk on the basis of a so-called psychometric paradigm (Slovic 1987). These psychologists developed an alternative approach to "expressed preferences", based partly on the work of Tversky and Kahneman (Tversky and Kahneman 1974) and elaborated by Fischhoff and colleagues (Fischhoff et al. 1979). The methodology reveals preferences, not on the basis of actual societal choices, but by measuring individual perceptions and judgments of risk-related options; in other words, the

lay public defines "risk" using a variety of qualitative variables, which is considerably different from the experts who define risk simply by the number of fatalities (Gould et al. 1988). The qualitative variables used by the public to define risk include the following (Slovic et al. 1979, 1980, Slovic 1987):

* Catastrophic potential: risks deemed to be catastrophic are feared more than those that are not.

* Voluntary vs. involuntary: people are much more willing to accept voluntary risks, even when they are more dangerous (rock climbing) than involuntary ones (living next to a nuclear power plant).

* Fatality: risks that are seen to be fatal are feared more than those that are not (Lichtenstein et al. 1978).

* Familiarity: risks that are perceived familiar (car crashes) are less feared than those that are not (radiation leaking from a nuclear power plant). Risks that are perceived as being familiar receive this status either by the frequency in which they occur, the mass media coverage that the risks are subjected to (availability index) or the complexity of the risk itself.

* Visibility vs. invisibility: risks that are perceived to be invisible such as radioactive fallout are feared more than those that are visible, such as trash. This does not mean that visible risks are ignored as in many cases they might still be perceived dangerous: eg, pollution being emitted from a smoke stack.

* Controllability: risks that individuals feel that they have no control over (management of a nuclear plant) are feared more than those one can control (driving a car).

Based on the insights in the risk perception literature, we developed the following three working hypotheses for this study:

* The respondents in Copenhagen would associate the risks of Barsebäck to be attached to a possible severe nuclear accident (eg reactor core meltdown) rather than a small radioactive leak due to the catastrophic potential factor;

* While respondents would be concerned about Eastern Europe's

environmental problems, they would view local environmental problems to be more significant; and

* The respondents would perceive the risks of Barsebäck to be more significant than the risks caused by Eastern Europe's environmental problems. The main reason for this is the factors of catastrophic potential (the plant might explode) and controllability (the public can not control the operation of the plant) which we considered would be associated with Barsebäck would outweigh the risk factors of visibility (eg dead fish in the Baltic Sea) and familiarity (eg acid rain from transboundary sources discussed in the media) which would be associated with East European environmental problems.

4. Methodology

The study was carried out in Copenhagen, the capital of Denmark with a population of 1.3 million. Copenhagen was picked because it is situated only twenty kilometers away from Barsebäck (on a clear day you can see the plant from the city) and because the city has experienced some environmental problems due to pollution of the Baltic Sea. However, concentrations of sulphur dioxide (causing acid raid) in the air in Copenhagen, as well as in other Danish cities, have not reached critical levels (Danish Environmental Ministry 1993b).

The study was made up of two research methodologies:

* To understand the policy-making climate in Denmark concerning Danish reactions to the Barsebäck plant and to East European environmental problems, in-depth, face-to-face interviews were conducted with leading policy makers in Copenhagen. In total fifteen policy makers were interviewed from a wide range of ministries including: the Energy Ministry, the Environmental Ministry, the Ministry of Interior, and the Municipal Environmental Ministry of Copenhagen.

* Secondly a telephone survey of 100 randomly selected individuals in Copenhagen was carried out to provide data about attitudes and perceptions toward the Barsebäck plant and East European

environmental problems. The response rate was 49 percent.[2] The survey instrument itself consisted of both close-ended and open-ended questions. Close-ended questions allowed the interviewer to elicit specific responses from participants. Open-ended questions were used as follow-ups to uncover citizen's knowledge of issues, such as East European pollution, without first offering them a possible answer.

5. Results

The results have been grouped into two sections. The first section discusses the respondents' views towards East European environmental problems (specifically acid rain) and East European environmental aid. The second section focuses on their views towards Barsebäck.

5.1 Danish perceptions of East European Environmental Problems

On the whole the respondents were concerned about their environment. Ninety-four of the 100 interviewed stated that their nation had environmental problems. However, they were more concerned about local than transboundary environmental problems (Table 1).

Table 1. What types of environmental problems are you concerned about?[3]

Air pollution	39
Emissions from cars	32
Over-fertilization	28

[2] In analysing the results there have been no attempts to differentiate between age, sex, income group, or political standing. The only statistically significant finding was that women were more concerned about safety aspects of Barsebäck (and hence more critical of the plant) than the men were. As this finding is by no means new (see Kunreuther et al 1994), it has not been elaborated on here. However, readers should bear in mind that as the men outnumbered the women in the sample by 59-41, answers may be skewed towards a more pronuclear view than the Danish population in general.

[3] All the tables in the result section are based on open-ended questions where the respondents can have more than one answer.

Trash	27
Water pollution	22
Industry in general	20
Waste from chemical plants	18
Ground water pollution	15
Acid rain	14
Ozone hole	8
Poisons	6
Energy sources	6
Industry in general	4
Oil pollution	4
Nuclear power	3
Other	16
Do not know	4
	N=94

As seen in Table 1, the most frequent responses are all related to local problems. Environmental problems that are not considered local, such as acid rain and the ozone hole, come far down on the list.

This finding is somewhat peculiar, as while interviewees were concerned about air pollution and auto exhaust emissions, Copenhagen does not experience serious problems of such kinds at the present. One fact supporting this is that such problems only extremely rarely, if at all, are reported on by the media.[4] Denmark has been quite successful in reducing lead content in exhaust fumes: through the use of various kinds of legal regulations, air emissions of lead were reduced by approximately 90 percent in 1978 compared to only a few years earlier. Since the fall of 1990, it has been mandatory for cars to be fitted with a catalytic converter. Because the catalytic converters use lead-free gasoline, it is expected that air pollution caused by lead will disappear from Danish cities within the next ten years (Danish Ministry for the Environment 1993b). The interviewees' concerns about air pollution and car emissions are thus more likely caused by problems of

[4] According to an examination of the coverage of environmental problems from 1989 until mid-1993 in leading Danish newspapers kindly made available to the authors by Henning Schroll, Senior Lecturer, Department of Environment, Technology, and Social Studies at Roskilde University Centre, Denmark.

the past than the present and perhaps the future. Therefore, we hypothesize that the most frequent mentioning of local problems can be explained by pointing to the visibility factor: eg fumes were seen to come out from cars' tail pipes and high smoke stacks and were perceived noxious. Perhaps even more surprising considering the large amounts of recent media coverage on the Barsebäck plant, the issue of nuclear power was mentioned by only three respondents.

Policy makers felt that local environmental problems have decreased significantly over time due to stricter environmental legislation. As one policy maker explained: "...We used to have a major sewage problem here in Copenhagen. The stuff was pumped out to sea with little treatment. This changed as we realized that this caused a rise in heavy metals in fish. Today sewage along with most other local problems are a topic of the past." (What about air pollution?) "All the new power plants in Denmark have installed flue-gas desulphurization units which cut sulphur dioxide emissions to virtually zero." (Policy Maker for the City of Copenhagen, February 1994).

Based on these findings, it seems that there is significant divergence between the views of policy makers and the dominant view among the respondents on the seriousness of local environmental problems: the latter group considering local problems to be much more serious than the former group.

When the respondents were asked whether East Europe's environmental problems affected Denmark, no less than 98 of the 100 respondents said yes. When asked how Denmark was affected, they came up with a wide array of responses (Table 2).

Table 2. How is Denmark affected by East European countries' environmental problems?

They are polluting the Baltic Sea	50
They are responsible for Denmark's acid rain problem	37
They have a lot of industrial waste	24
They have unsafe nuclear power	20
Pollute the air	9
Cause global pollution problems	2
Pollution crosses borders	2

Pollutes the land	2
Other	8
Do not know	7
	N=98

Some of these responses are surprising while others are not. Compared to other countries, acid rain is not a major problem in Denmark. However, pollution of the Baltic Sea is rather frequently covered in the Danish media. The most well-covered issue in the press is eutrophication which is caused by overload of nutrients, depletion of fish stocks, and illegal dumpings of toxic wastes. Another issue prominently covered is the apparently enormous amounts of toxic air emissions from East Europe, especially from heavy industry located in Poland and former East Germany.

The response that 'they have unsafe nuclear power' relates to the Danish fear of nuclear power on a whole and East European nuclear power in particular. Denmark is considered to be among the most antinuclear nations in Europe with recent results showing a large majority of the population opposing the building of nuclear plants in Denmark (Jamison et al 1991). The Danes were affected by the 1986 Chernobyl accident and there is frequent discussion in the press of the possibility that several East European reactors, such as the Ignalina reactors, can cause serious environmental damage (Riishöj 1993). Based on this one can hypothesize that the Danes fear East European reactors mainly because of the catastrophic potential factor although other risk factors such as controllability are also important.

This was confirmed by several of the policy makers that were interviewed. According to one policy maker: "Of course we are concerned about Ignalina and other East European reactors. Look what happened at Chernobyl. Something has to be done to make them safe and therefore we are providing aid to several plants." (Official at the Danish Energy Ministry, February 1994).

As almost all of the Copenhagen respondents felt that East European environmental problems affected Denmark, one can assume that they also would be in favour of giving environmental aid to these nations primarily to help solve

domestic environmental problems. The study showed, however, that this was not entirely the case. As seen in Table 3, although 95 of the 100 respondents were in favour of giving environmental aid to Eastern Europe, a majority of the respondents felt that altruistic reasons (To help their environment which they need) was more important than protecting their own domestic environment (Saves the Danish environment).

Table 3. Why should Denmark give environmental aid to Eastern Europe?

To help their environment which they need	48
Saves the Danish environment	41
Pollution crosses borders	4
Good for the Danish industry	3
To help future generations	3
Other	8
Do not know	3
	N=95

These responses seem predominantly based on altruism which perhaps is a surprising finding. But the consideration of a combination of factors can to a large extent explain this. First, since the early 1960s Denmark has been providing development aid to developing countries. In 1978 development aid amounted to 0.7 of GDP, and it increased to 1 percent of GDP in 1993 (Ministry of Finance 1993). The Danish government's commitment to assisting developing countries reflects concerns that probably are rather identical to those that explain support for environmental aid to Eastern Europe. Second, it should also be realized that the issue of environmental aid to Eastern Europe to some extent resembles a so-called "motherhood-and-apple-pie issue": an issue no one can legitimately oppose. Studies have also shown that people might reconsider their willingness to contribute when they are presented with the bill. Finally, it should be noted that a significant number of the respondents supported environmental aid to Eastern Europe as it presumably would save the Danish environment. In other words, a significant concern for protecting self-interest prevailed.

The above findings show that the Copenhagen respondents were concerned

about the environment as a whole, but that their concerns were primarily about local rather than transboundary problems. However, when they were probed on East European environment problems they expressed a high degree of concern.

The Danish Public and the Barsebäck Plant

Past studies have shown that the Danes are very much opposed to the Barsebäck plant, primarily because it is too close to Denmark. Results from a Gallup study conducted in 1992 show that 83 percent of Copenhagen's inhabitants are against it because of this reason (Berlingske Tidende 1992). Based on this, one could hypothesize that the public would also be concerned about the safety of the plant (catastrophic potential), as otherwise, why would they be against the plant in the first place? Results from our study did not fully corroborate with the earlier Gallup finding. Although a large majority of the respondents were extremely antinuclear (87 of the respondents did not think that Denmark should develop the nuclear power option) only 53 percent felt that the plant was unsafe while 34 percent believed that the plant was safe. Those who felt that the plant was unsafe came up with several factors (Table 4).

Table 4. Why do you think that the Barsebäck plant is unsafe?

There have been many mishaps recently	24
No one knows how safe it is	21
Too close to Copenhagen	5
Nuclear power is unsafe	3
The human factor	1
Other	3
Do not know	2
	N=53

Hence, possibly a lesser number of Copenhagen inhabitants are worried about the safety aspects at Barsebäck then what has previously been believed. This in turn corroborates well with the finding from Table 1 where only 3 of the 100 respondents considered nuclear power to be an environmental problem. This

raises the question of whether the entire Barsebäck crisis might have been exaggerated by the politicians and the media. Significantly, our study also showed that the Copenhagen respondents where quite understanding towards Sweden concerning the Barsebäck plant which they would not be if they were very unhappy about the plant. For instance, 29 percent of the respondents felt that the Swedes needed Barsebäck because it is dependent on the electricity generated by it (Table 5).

Table 5. Danish views on why Sweden needs Barsebäck?

Sweden needs the electricity	29
Expensive to close it for Sweden	5
Denmark needs the electricity	3
Sweden does not want to remove it	3
Part of Sweden's energy research	3
Other	4
Do not know	3
	N=42

This goes against the views of policy makers. According to one from the Energy Ministry: "The Swedes should close Barsebäck now as it is too close to Copenhagen". (Bildt [Swedish Prime Minister] says that the plant is one of the safest in the world). "Of course, Barsebäck is a safe plant, but there is still a chance of a nuclear accident which would have devastating consequences for Copenhagen. There is the human factor, you know." (Danish Policy Maker at the Energy Ministry, February 1994).

Several policy makers agreed with this view. One with the Interior Ministry said: "...The Swedes should put a firm date on when Barsebäck is closed and then they should keep the date. We and the Danish public in general are so concerned about the plant. I think something like 80 percent of the population are against it. I can't understand why the Swedes don't close it. It was built in the wrong place....We even took a parliamentary motion on it: it would definitely lead to better relations between the two countries." (Danish Policy Maker within the Interior Ministry, February 1994).

In sum, this exploratory survey shows that a majority of the Danish

respondents were concerned about the safety factors of the Barsebäck plant, but that this was a significantly smaller number than what has been found in previous findings. More research using a larger sample size is needed to confirm this finding. Additionally, the survey seems to indicate that the Danes were more understanding of why Sweden needed Barsebäck then the Danish policy makers. This latter point also needs further investigation.

Findings

When we review the three hypotheses we come to the following findings:

The respondents in Copenhagen did consider the risks of Barsebäck to be more attached to the possible nuclear accident rather than a radioactive leak. However, it is unclear whether this is due to the factor of catastrophic potential per se. As shown in Table 4, the main reason for the respondents stating that the plant was unsafe was because that there have been several faults recently. This probably implies the two nuclear incidents which occurred in the falls of 1992 and 1993. If this is the case the answer is more likely to based on the "availability heuristic" (Tversky and Kahneman 1973): eg the more media coverage on a topic the more concerned one becomes. As the survey was conducted in January 1994, that is only 3 months after the second accident, the incident would still be easily recalled. The second most popular response in the same table "no one knows how safe it is" can be related to the fear of the unknown (Slovic 1987). This fits well with the view of some political scientists who, upon examining the nature of the risks and uncertainties involved, find that nuclear power (a 'low probability/high risk' technology) should not be pursued 'as the risks are too uncertain, and the possible consequences too enormous in their magnitude and too extraordinary in their character' (Goodin 1982, p.219).

The second hypothesis proved to be semi-right. As hypothesized, respondents were more concerned about local than transboundary problems. However, the respondents were concerned about East Europe's environmental issues only when they were probed on the topic. There are several likely explanations why this is so: local environmental problems are more visible (eg cars

in the streets of Copenhagen); in general, there are many more local environmental problems than transboundary ones; due to the frequency of local environmental problems they attract more media attention although the media does at times have detailed accounts on prominent transboundary problems (eg depletion of the stratospheric ozone layer, global warming as well as examples of marine pollution). The outcome can, once again, be explained as an example of the availability heuristic.

The hypothesis that the respondents in Copenhagen would perceive the risks of Barsebäck to be greater than the risks caused by East Europe's environmental problems remains unconfirmed. When the respondents were unprompted they were more concerned about local problems than both nuclear power or transboundary problems such as acid rain. However, when they were prompted a majority of them were concerned about both issues. That said, we would like to hypothesize that the Danes are more concerned about East European environmental problems than with Barsebäck as virtually all of the respondents (95 of 100) felt that Denmark should give environmental aid to Eastern Europe.

Some policy makers, however, would probably disagree with this hypothesis as they themselves have on several occasions compared East Europe's environmental problems (particularly the ones related to nuclear safety) with those associated with Barsebäck. One policy maker said, for instance: "We are all very concerned about East European nuclear reactors. I am happy that Greifswald was closed. I also hope that the Swedes close Barsebäck. We have already had Three Mile Island and Chernobyl." (But Barsebäck is not a Chernobyl type reactor). "I know that, but something could always happen. There is the human factor you know." (Policy maker at the Danish Environmental Ministry, February 1994).

Conclusions

This study has shown that the Danish public is to a certain degree concerned about environmental risks caused by East European environmental problems as well as by the risks posed by Barsebäck. Some of these concerns have their roots in factors pointed to in the risk perception literature. For instance, some Danes were concerned about Barsebäck and Eastern Europe possibly because of the press coverage of the two incidents at the nuclear power plant in the first instance and the eutrophication of the Baltic Sea in the second instance (the so called availability factor).

Policy Recommendations

We will conclude by briefly discussing one significant aspect implicit above, namely the importance of public support to environmental policy and, more generally, increased dialogue between government and the public about goals and means of environmental policy. It is an ideal situation, and perhaps an unattainable one, when a government enjoys full public support behinds its actions. Without suggesting that the Danish government in the cases examined here received unusually little public support, we find it worthwhile to discuss public support to international environmental policy. What are the best ways a government can explain and hopefully create public support behind its environmental policy?

Let us start with what might look inadvisable or perhaps instead a trivial suggestion: the public should not be informed about environmental risks through mass media only.[5] Unsurprisingly, our survey showed that the public is very influenced by the media. In other words, the media are a significant source of

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[5] Around the time of the United Nations Conference on the Environment and Development (UNCED) which took place in June 1992 in Rio, many wanted mass media to play a bigger role in communicating information about environmental degradation to the public. Some academics also want the media to play an educative role in environmental management. See, for example, "The Salzburg Initiative. Improving the Process of Environmental Diplomacy", IENN BULLETIN, November 1990, vol.1, p.4.

information to the public, probably the dominant source. However, the media have well known limitations: most importantly, a strong tendency to focus on headlines more than on details, a tendency to exaggerate controversy and discuss environmental problems in a bad-guys-versus-good-guys context (Klaidman 1990; Peltu 1985). Environmental issues, similar to other science-intensive issues, would benefit from a different kind of reporting: reporting that paid attention to scientific and technical details, which distinguished what is known from what is not, and which as much as possible presented the various solutions to a particular environmental problem in a neutral and balanced way. Due to the strong incentives to sell newspapers and get high ratings, however, such reporting seems not immediately forthcoming on a large scale.

Experts also play a role in communicating risks to the public, and some find that experts should educate the public and the government (eg. the idea of a 'science court') about environmental risks (Rip 1985). But the role of experts should be carefully considered. Straight forward source-to-target risk communication programmes do not usually work because, first, the experts are in many cases just as biased as the public (Freudenburg 1988) and, second, the public in many cases distrust the experts (Slovic 1993). More promising, instead, is it when steps are taken 'to enhance public understanding' (Granger-Morgan 1993). In particular, better arrangements for citizen participation in decision making should be created. And experts, as Giandomenico Majone has concluded, might also have an important role to play: "The main task for policy analysis... is not to determine theoretically correct solutions, but to raise issues, probe assumptions, stimulate debate, and especially to educate citizens to distinguish between good and bad reasons." Majone 1990, p.158).

We have not in the above assessed the Danish government's attempts to explain and justify its international environmental policies to the Danish public. Such a study is beyond the scope of this article. Nonetheless, it should not be ignored that also a government may (and should) take steps to engage the public in debate and dialogue. By using mass media to explain reasons, instruments and goals of policies, and through meetings and discussions with interested and

concerned individuals and groups, the public debate and dialogue with the government can be intensified. By taking such steps, policies can be explained, they can perhaps be improved when it is possible, and public support may be enhanced. While such an approach has its clear limitations, by inviting interested and concerned citizens and groups to meetings and discussions the government and other policy makers can play an important role in enhancing public debate about the reasons, instruments, and goals of international environmental policies (Reich 1990).

In the future we will most likely continue to see a combination of these three sources of information to the public: mass media, experts, and the government. Of the three, mass media quite clearly have the biggest impact on public opinion and will for that reason continue to be the most important (Ringius 1994).[6]

Viewed as a policy arena, international environmental policy is a particular challenging one for governments. The risks of transboundary and some other international pollution problems are often invisible, their sources may be located in other countries, and their impacts are felt only decades later. These characteristics create indeed a significant demand on governments' ability to communicate to the public and stimulate public debate. We have proposed a few ways in which a government might increase public understanding of its choice of environmental policy.

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[6] Environmental NGOs are important sources of information to thee public-and sometimes also to government-which we have not discussed here. For the role of environmental NGOs in communicating environmental risks see Ringius 1994.

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