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Ragnar E. Löfstedt

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Fairness across Borders: The Barsebäck Nuclear Power Plant*

Ragnar E. Löfstedt**

Since 1992, Sweden and Denmark have faced a diplomatic problem over nuclear reactors at Barsebäck in southern Sweden, less than 20KM from Copenhagen. Danes feel that it was built too close to densely populated areas and they would be affected by any accident. Swedes argue that acid rain from Danish coal-powered plants falling over southern Sweden poses equally serious problems. This paper discusses the history of this controversy, its escalation and possible solutions.

Theoretical Tools

The concepts of process and outcome fairness and preference reversal will be used to analyse the issues.

The fairness concept can be applied to siting issues¹ and to transnational controversies in environmental negotiation.² Studies have shown that such disputes cannot be resolved without reference to what is viewed as fair by conflicting parties.³

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** Dr Löfstedt is a Lecturer in Social Geography at the Risk Research Group, Centre for Environmental Strategy, University of Surrey (UK). He received his BA (Geography) from UCLA, and M.A. and Ph.D. (Geography) from Clark University.

¹ Howard Kunreuther, Kevin Fitzgerald & Thomas D. Aarts, *Siting Noxious Facilities: A Test of the Facility Siting Credo*, 13 *Risk Anal.* 301 (1993); also the following presented at the 1994 IIASA workshop: Howard Kunreuther, Paul Slovic & Donald MacGregor, *Risk Perception and Trust: Challenges for Facility Siting and Risk Management*, Joanne Linnerooth-Bayer & Benjamin Davy, *Hazardous Waste Cleanup and Facility Siting in Central Europe: the Austrian Case*; and Ortwin Renn, Thomas Webler & Hans Kastenholz, *Fairness and Competence in Siting a Landfill: A Case Study from Switzerland*.

² Joanne Linnerooth-Bayer, *Fairness in Dealing with Transboundary Environmental Risks*, Unpublished (1995).

The concept of fairness in a negotiating context has structural, process, procedural and outcome components.⁴ Structural fairness refers to the make-up of the negotiation process, i.e., the negotiating parties, the complexity of the issues that are being negotiated, the rules and codes guiding the negotiation process, and its logistics.⁵

Process fairness concerns itself with whether negotiating parties perceive that they are treating each other fairly and, related to this, how their perceived views of the future outcome fairness may influence the negotiation process.⁶

Different types of negotiating tools make up the concept of procedural fairness. Procedures considered fair include concepts such as equal sacrifices or "tit-for-tat" solutions⁷ or fair chance procedures, such as arranging a lottery.⁸

Outcome fairness is concerned with principles underlying the allocation of burdens and benefits within the agreement itself.⁹ Three allocation principles most often discussed are equality, equity and justice.¹⁰

Studies on siting indicate that people frequently reverse preferences when they realize that a selection procedure to which they have agreed turns out to victimize them.¹¹ In such cases they try to explain obvious inconsistencies by referring to incomplete knowledge at the time of the original decision, unfair implementation of the agreed upon selection rule, or the advent of new circumstances.¹²

3 *Id.*

4 Cecilia Albin, *The Role of Fairness in Negotiation*, 9 *Negotiation J.* 223 (1993).

5 *Id.*

6 *Id.*

7 Daniel Druckman & T.V. Bonoma, *Determinants of Bargaining Behaviour in a Bilateral Monopoly Situation...*, 21 *Behav. Sci.* 252 (1976).

8 H. Peyton Young, *Equity: In Theory and Practice* (1994).

9 *Id.* and Albin, *supra* note 4.

10 Morton Deutsch, *Equity, Equality, and Need: What Determines Which Value Will Be Used as the Basis of Distributive Justice?* 31 *J. Soc. Issues* 137 (1975); and Young, *supra* note 8.

11 Bruno S. Frey, Felix Oberholzer-Gee & Reiner Eichenberger, *Old Lady Visits Your Backyard — A Tale of Morals and Markets*, unpublished (1994).

12 *Id.*

Historical Context of the Barsebäck Controversy

The controversy surrounding the Barsebäck plant has been a source of political and public dispute since the two reactors came on-line in the mid-70's. To understand and analyse the situation, and draw possible solutions, it is necessary to look briefly at the history behind the planning and the building of the plant.

From the period when Sydkraft (the utility that built and operates Barsebäck) presented the plans of a nuclear power station in 1968 to granting planning permission in 1970, Danish policy makers raised no objections. The lack of opposition may be partly explained by Danish plans for nuclear power. Until the mid-70's, Danish policy makers had considered building nuclear reactors of their own,¹³ and when Barsebäck was being built, Sydkraft signed several electricity transfer deals with their Danish counterparts. Hence, building the reactors so close to Copenhagen could have been viewed by some Danes as an opportunity to increase their knowledge of building and operating nuclear power plants.¹⁴

Yet, since the reactors first became operational, they have been a source of political and public dispute. The plant was the focus of domestic outrage during the 1976 "nuclear elections" and the site of large demonstrations at the time of the 1980 Swedish nuclear referendum. The Danes even passed a bill in parliament in 1986 calling for its complete closure. In 1988, due to Danish pressure, Birgitta Dahl of the Social Democratic Party, then Swedish Energy and Environmental Minister, forced a bill through parliament calling for the shut-down of two reactors by 1996, one from the Barsebäck site. Only three years later, this decision was revoked due to pressure from the Liberal and Conservative parties and powerful trade-unions, traditionally allied with the Social Democrats. Although this decision caused concern among Danish policy makers, their reaction to the plant's safety problems in 1992 and 1993 marked the low point in Swedish-Danish relations over the plant.

On July 28 1992, during start-up of reactor II (following routine maintenance), a water pipe broke, causing insulation to fall into the

¹³ Andrew Jamison et al., *The Making of the New Environmental Consciousness* (1990).

¹⁴ Sven Bergqvist, *De Heta Åren* (1985).

water cooling system. The reactor's inlet filters were blocked within twenty minutes but cleared again through a back-flooding mechanism. A couple of months after the incident, SKI (the Swedish Nuclear Inspectorate) ordered all reactors with similar filters to be shut down and the filter systems redesigned. SKI felt that the system posed an unacceptable risk of core meltdown.

Between the shutdown and the restart of the reactors, the Danish Government, environmental NGO's, the Swedish Centre Party (headed by the antinuclear Olof Johansson), and several other influential Swedes (including the ex-Finance Minister, Kjell-Olof Feldt) lobbied hard to close the plant permanently.¹⁵ The Danes felt the reactors should not 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 1.3M inhabitants.

These arguments were not heeded. Sydkraft completed modifications to the filtering systems, and the reactors went back on line in January 1993. This caused a massive outcry in Denmark. The Interior Minister, Thor Pedersen, went so far as to suggest that the provinces Sweden had captured from Denmark in 1658 (including Skåne where the Barsebäck plant is located) should be retaken through military means. Carl Bildt, then Swedish Prime Minister, felt that this statement was extremely ill advised as it threatened Scandinavian cooperation besides being ridiculous.¹⁶ As sharp language failed to resolve the conflict, a "war of humour" broke out. Anders Björk, then Sweden's Defence Minister, threatened to attack the Danes with fermented herring, and journalists from the Danish newspaper, Ekstra Bladet, dumped old smelly cheese at the Barsebäck plant.¹⁷

Negative Danish reaction was to be expected, considering that 83% of Copenhagen's population is against nuclear power (70% in the rest of Denmark) and that 82% of Danes wanted their government to pressure Sweden to close the plant permanently.¹⁸

¹⁵ Kjell-Olof Feldt et al., *Förhindra ett Svenskt Tjernobyll!* Dagens Nyheter 20 Oct. 20, 1992, at A4.

¹⁶ *Danskt Smil Retar Bildt*, Dagens Nyheter, Jan. 7, 1993, at. A7.

¹⁷ *Barsebäck Maltavala i Humorkrig*, Dagens Nyheter, Jan. 11, 1993, at A5.

¹⁸ Anders Hellberg, *Dansk oro Stoppar inte Barsebäck*, Dagens Nyheter, Dec. 29, 1992, at A6.

During the five month shutdown, the electricity short-fall was made up through greater use of hydropower from northern Sweden and fossil fuel plants in southern Sweden and Denmark. Over this period, southern Sweden experienced a 10% increase in SO₂ and NO_x emissions causing increased acid rain.¹⁹ The shutdown also resulted in a loss of revenue for Sydkraft of 25M Crowns a week,²⁰ as well as a substantial profit for the Danish power companies generating the replacement power for large parts of southern Sweden.

Methodology

An approach consisting of in-depth interviews and telephone surveys was used. Malmö and Copenhagen were selected for study as they both have large populations approximately 20KM from Barsebäck and have been centres of debate about the plant.

In-Depth Interviews

To understand the energy and environmental policy-making climate in Stockholm and Copenhagen concerning Barsebäck, in-depth, personal interviews were carried out with fifteen key politicians, seven representatives from several of the major Danish and Swedish utility companies (including Sydkraft), and eight representatives from various environmental NGOs who were directly involved in the debate (e.g., Greenpeace Denmark and The Organization for Information about Nuclear Power-OOA).

Random Telephone Questionnaire

A telephone survey of 100 randomly selected individuals in each city was carried out to provide data about attitudes and perceptions toward the plant and to see if the public agreed with policy makers. Respondents were randomly selected from the current local telephone directory, and response rates of 65% for Malmö and 49% for Copenhagen were obtained. Although the samples in both cities roughly corresponded to socio-demographic breakdown of the city's inhabitants as a whole, the male-female ratio for the Danish sample did not. In the Copenhagen sample, 59 males and 41 females were

¹⁹ Stefan Leo, *Surare i Kronoberg*, Smalandsposten, Jan. 14, 1993, at 15.

²⁰ Thomas Lerner, *Miljardbesparing Stänga Barsebäck*, Dagens Nyheter, Dec. 3, 1992, at C2.

interviewed, which based on previous research should skew the results in a pronuclear direction as men have been shown to hold more pronuclear views than women).²¹

Results

The first three sections look at views of three main groups: policy makers, the public and Sydkraft. Last, I discuss possible solutions.

Policy Makers in the Two Countries

Swedish policy makers felt that process fairness was invoked during the siting and building of the nuclear power plant, as their Danish counterparts had been continuously consulted. In fact, the Danish Government knew about Sydkraft's plans at Barsebäck before the local population. According to Swedish policy makers, had the Danish government complained as much about the plant when it was being built as they do now, it would have been built elsewhere. But as no complaints were raised, it is hard to see why Sydkraft should not have built the plant where they did.

According to a local Swedish policy maker:

The Danes were consulted throughout the process. We were nice to them. We even invited them to inspect the plant. It is not our fault that Denmark's nuclear policy has changed over time.... If they had made this fuss earlier we would not have built the plant at Barsebäck.

That said, many policy makers realized that even if process fairness had been achieved, outcome fairness had not.

I do understand the Danish view to a certain degree. Although they receive benefits from Barsebäck in the form of cheap electricity [Swedish nuclear electricity is cheaper than electricity produced from Denmark's coal plants], they have no control over the reactor even when it is so close to Copenhagen. (National Swedish policy maker)

Danish policy makers felt that in some instances people have a right to change their minds based on historical precedent. They believed, for instance, that policy makers should be allowed to alter their views if a technology is deemed less safe than was previously believed. According to a National Danish policy maker:

²¹ Kunreuther et al. (1994), *supra* note 1.

Even if our predecessors were consulted on this matter, times have changed. We had Three Mile Island and we have had Chernobyl. Back then we did not know how unsafe nuclear power actually was.... Of course, Barsebäck is a safe plant, but there is still a chance of a nuclear accident which would have devastating consequences for Copenhagen.

Preference reversal was also shown by Swedes with regard to nuclear power and some Danish policy makers emphasised this. For example, a national policy maker said:

We really feel betrayed. A decision was made in 1988 that one Barsebäck reactor should be phased-out soon and Swedish policy makers should stick to that. We made a decision to build the Oresund bridge (bridge connecting Copenhagen with Malmö) and we are not going to back down due to public pressure.... We will continue to put pressure on Sweden until they come up with a date to close Barsebäck.

Overall, Danish policy makers rejected Sweden's position that process fairness had been achieved as irrelevant, and they wanted to see more attention being paid to outcome fairness. Their view appears to adhere to the concept of preference reversal, as past decisions (to agree to Barsebäck being built 20KM from Copenhagen) are now being said to have been made with incomplete knowledge (Three Mile Island and Chernobyl accidents).

Swedish and Danish Publics

In general, residents of Malmö understood how their counterparts in Copenhagen felt, even though they themselves were more pronuclear. While 81% of Malmö respondents were pro nuclear, 72% said they appreciated Danish concerns about the Barsebäck plant, the majority citing the fact that they live close to the plant (57%). A similar view was seen in Copenhagen. Although 87% of respondents were antinuclear (stating that Denmark should not have any nuclear power plants), 68% understood why Swedes were more in favour of the Barsebäck plant than Danes; the most common response (28%) being that it was an economic issue (e.g., too expensive to shut Barsebäck down).

Sydskraft's View

The people interviewed at Sydkraft argued that process fairness had been achieved and Danes could not complain about outcome fairness.

In this respect they agreed with Swedish policy makers. A senior Sydkraft official summed up the company's view:

When we decided to build Barsebäck the Danes did not complain.... Some [Danish] policy makers actually liked the idea as there were plans to build nuclear power in Denmark, and Danish utility companies also liked it as they saw an opportunity to buy cheap electricity from the plant.... The Danes did not complain about the plant until both reactors were up and running. It was too late to complain then. A large investment has been made, and if the reactors are to be shut down we need to be compensated. We would not have built two reactors at the Barsebäck site if we had realized that the Danish public and policy makers would be so adamant against nuclear power.... We can't take back what has already happened. It would be unfair if we had to close the plant. We have done nothing wrong.... The Barsebäck plant has an exceptional safety record and is one of the best nuclear reactors in the world.

There was consensus among officials interviewed that there could be no compromise at this stage. The two reactors would be closed either because of financial or safety problems (whichever came first), but not by public opposition.

The Possibility of a Compromise

On numerous occasions, Swedish policy makers have raised damage to Sweden's soil and water from Danish acid rain in response to safety and unfairness arguments about Barsebäck. This debate entered a new phase in December 1993. At a Nordic Council of Ministers meeting in Oslo, the Swedish and Danish Prime Ministers undertook to set up an environmental working group to discuss both the possible phase-out of the Barsebäck reactors and reducing acid rain. This would seem to be a good example of procedural fairness using the tit-for-tat procedure.²² On the surface, this appears to be fair, but it is unclear whether it is practically and/or politically feasible, or indeed really fair. The majority of Swedish policy makers are reluctant to reopen the debate. The socio-economic consequences of an accelerated phase-out of the two reactors was already discussed in detail in a 1987 Swedish Energy Administration report, showing that the negative effects on southern Sweden would be considerable.²³

²² Albin, *supra* note 4.

Yet, this tit-for-tat solution, would be beneficial for Denmark as it is planning, in any case, to substantially reduce SO₂ emissions to meet international environmental guidelines. In other words, the Danes are incurring no extra expenses in agreeing to the swap.

Obviously, this solution is not entirely symmetrical. Swedes would be forced to shut down two nuclear reactors, while the Danes would only be required to install desulphurization units on their coal plants.

One fair (albeit impractical) tit-for-tat solution would be for Swedes to close Barsebäck and Danes to close equal coal-fired capacity. All policy makers found the idea ridiculous. As there would be a major electricity shortage in both nations, they did not even wish to comment. The suggestion was also put to residents in Copenhagen, and the majority were in favour of this kind of tit-for-tat solution. Fifty-six percent felt that it would be a good idea to remove equal amounts of coal generating capacity for the nuclear capacity at Barsebäck. They felt that policy makers in both nations should undertake this mainly because the environment would then be cleaner (Table 1).²⁴

Table 1.

Reasons why Danish respondents felt that a "tit-for-tat" swap is a good idea
(N = 56; respondents could give more than one answer; open ended question)

The environment would be cleaner	15
We have several energy alternatives	14
We have to do this	9
Will reduce acid rain	9
Use natural gas instead	6
Reduce carbon dioxide emissions	2
Other	5
Do not know	3

²³ Swedish Energy Administration, *Efter Tjernobyl-Förtida Avveckling av Barsebäckverket* (1987).

²⁴ This question was not asked in Sweden as the issue had not been discussed by the press or policy makers prior to the Swedish interviews. For more, see Ragnar E. Löfstedt, *The Evaluation of a Risk Communication Project: The Case of the Barsebäck Nuclear Power Plant, forthcoming Energy Policy* (1996).

Conclusions and Policy Implications

The Barsebäck example shows that Swedish decision makers felt their policies were justified on the basis of process fairness, while Danish policy makers argued that process fairness was largely irrelevant because of historical precedent (caused by a preference reversal from nuclear power being seen as a necessary and good energy sources to a situation where nuclear power was seen as dangerous and unnecessary) and now felt that the plant as unjustified due to a violation of outcome fairness.

It is uncertain, however, if invoking fairness principles will indeed help to solve this issue. Although the acid-rain-nuclear-power trade off, is a good example of (tit-for-tat) procedural fairness, it is unlikely to be practical. Unless new, commercially viable renewable energy sources can be developed in both nations in the short-term, such actions would result in a major shortage of electricity in both nations.

The implications of this study are two fold:

First, it suggests that the public in both nations (especially in Denmark) were more rational and understanding of each other's view points than were policy makers. Although this needs further study, it indicates a possible role for public participation in resolving transnational controversies.

Second, the study highlights the problems associated with preference reversal, i. e., policy makers and the public changing views concerning a disputed technology. As discussed above, Danish policy makers were at first pronuclear while the public was indifferent. Only after the two Barsebäck reactors were up and running, did the Danes *start* to oppose Barsebäck actively. How a change in public opinion can be addressed once a facility is up and running, for instance, is an interesting area for future research.

