Chemical Control Policy in Sweden, What is Next?

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Sweden has long been seen as a pioneer in the area of chemical control policy. In 1995 it put forward a so called "generation goal" which called for a phasing out of all human made chemicals within a 25 year period. The Swedish Government took up the challenge of how to best reach this goal by putting forward a number of environmental quality objectives, which were approved by the Swedish Parliament in 1999. What has happened since then? Will Sweden reach its proposed generation goal? This paper addresses these two questions.

I. Introduction

Sweden has long been seen as one of the "pioneers" of modern European environmental policy[1]. There are several reasons for this pioneering status, which was more or less established around 1965-1968 when the number of environmental bills going through the Swedish parliament doubled[2]. These include the fact that its industrial revolution started later than other European states, the increase in the number of influential environmental books published, including the 1963 Swedish translation of *Silent Spring* and Palmstjerna's *Plundering, Svalt, Forgiftning* [3], and leading Swedish academics being at the forefront of environmental research[4]. In addition, over the past 40 years or so a number of political parties, most notably the Centre Party and the Green Party, have attempted to win the "green vote" by systematically arguing for tougher environmental regulations, especially in the area of chemical control[5].

Historically, Swedish chemical control policy has been based on both precautionary and substitution principles using hazard classification mechanisms rather than risk analysis as its foundation[6]. In the wider academic literature there have been a number of proposed definitions for these principles[7]. Swedish policy makers, however, have developed their own definitions of these principles. For example, the Swedish Committee on New Guidelines notes:

- Precautionary principle: "...precautionary measures must be taken as soon as there is reason to assume that an activity or a measure may lead to damage or nuisance to human health or the environment".[8]
- Substitution principle: "...entails that less harmful or harmless chemical products should be substituted for harmful products wherever possible".[9]

While in the recent November 2013 Swedish Government Bill on chemical policy the Government argues:

- Precautionary principle: "When there is a threat about a serious or an irrepairable damage to the environment, then the lack of scientific evidence should not be used as an excuse to postpone cost effective measures to reduce environmental damage".[10]

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1 D. Liefferink and M. Andersen, "Strategies of the 'green' member states in EU environmental policy making", 5 *Journal of European Policy* (1998), pp.254-270.

2 R. Lofstedt, "Swedish chemical regulation: An overview and analysis", 23 *Risk Analysis* (2003), pp.411–421.

3 L.J. Lundqvist,*Miljoforvaltning och politisk struktur* (Lund, Sweden: Prisma 1971).

4 L.J. Lundgren, *Forsurning pa Dagordningen: En bild av handelseforlopp 1966-1968* (Stockholm: Forkningsradsnamden 1991).

5 E. Vedung, "Uppseendevackande helomvanding av C", *NU* 7th February (1991), pp. 23–33.

6 Lofstedt, "Swedish chemical regulation: An overview and analysis", *supra* note 2.

7 P. Sandin, "Dimensions of the precautionary principle", 5 *Human and Ecological Risk Assessment* (1999), pp. 889–907.

8 Swedish Committee on New Guidelines on Chemicals Policy, *Non Hazardous Products: Proposals for implementation of new guidelines on chemicals policy* (Stockholm: Fritzes 2000), p.88.

9 Swedish Committee on New Guidelines on Chemicals Policy, *Non Hazardous Products: Proposals for implementation of new guidelines on chemicals policy, supra* note 8, p.89

10 Swedish Government Bill, *Pa vag mot en giftfri vardag-plattform for kemikaliepolitiken 2013/14:39* (Stockholm: Swedish Government 2013), p.15.

– Substitution principle: "There is a responsibility to avoid, to use, or sell chemical products that can cause damage to public health or the environment if the products can be substituted with less hazardous products and if it is feasible to use or sell these instead".[11]

There are plenty of examples of these principles being used. The 1969 Swedish Environmental Protection Act reversed the conventional burden of proof, thereby requiring industry to show the safety of environmental hazardous activities rather than having the regulators proving that these activities were unsafe[12]. The substitution principle became part of the 1973 Swedish Chemical Regulation and in 1984 the Nordic countries came together to develop criteria for classifying environmentally- hazardous substances[13].

Swedish chemical control policy has its roots in the 1995 Esbjerg (OSPAR) Declaration on the North Sea, which calls for a phasing out of all chemical substances within a 25-year period[14], commonly referred to as the "generation goal". To be precise, the declaration states that concentrations of substances that occur naturally in the environment should be close to background levels, while concentrations of man-made synthetic substances should be close to zero. Within the declaration a strict hazard classification system was adopted implying that all substances that were liable to bio-accumulate, persist in the environment, or were toxic were to be phased-out. The Swedish Government took up the challenge of how to best reach the "generation goal" when the Cabinet put forward a rather radical environmental bill in 1997, which called for 15 (later raised to 16) environmental quality objectives[15]. This Bill was approved by the Swedish Parliament in 1999. The underlying goal is that within a generation, that is by the year 2020, these objectives will have been realised. The environmental objectives include "good quality groundwater" and "a protective ozone layer" both of which may be achievable. However, it also includes the objective "non-toxic environment", seen by many observers as one of the most difficult to reach. This objective was discussed at length in the 2000 Government Bill on Chemical Strategy [16], in the Allparty Committee report of 2012[17] and again in an another Government Bill in 2013 on the same topic[18] and these documents are the main focus of this article. Within the "non-toxic environment" objective the Swedish Parliament announced that there would be a number of sub-goals including: information about hazardous substances, the phasing out of hazardous substances, risk reduction in handling hazardous substances, reducing dioxins in food and clean-up of contaminated land[19].

So what has happened since the passage of the 1999 Swedish Government Bill regarding the 16 environmental objectives, particularly the "non-toxic environment" objective? Is Sweden now closer to reaching its generation goals? If not, what is the Environmental Ministry doing to address this? And has the attempt to reach difficult environmental objectives led to inconsistent environmental policy making? These questions are systematically addressed in this article. The paper is based on an analysis of the Swedish policy literature, something I have systematically followed for some 25 years, and 40 informal and formal interviews with regulators, policy makers and stakeholders active in the Swedish chemical control policy sector.

II. What has happened in relation to the "non-toxic environment" objective since 2002?

Some eight years after the "generation goal" objectives were set, the Swedish Government realised that achieving success with the 16 environmental quality objectives would be difficult. As a result, in its March 2010 Environment Bill the Government changed the

11 Swedish Government Bill, *Pa vag mot en giftfri vardag-plattform for kemikaliepolitiken, supra* note 10, p.16.

12 Swedish Government Bill, *Miljoskyddslag* (Stockholm: Swedish Government 1969).

13 A. Lundgren, *Comparison of different models for hazard classification of chemicals. Keml rapport no.9/89*. (Sundbyberg, Sweden: Swedish Chemicals Agency, 1989)

14 Lofstedt, "Swedish Chemical Regulation: An overview and analysis", *supra* note 2.

15 Swedish Government Bill, *Svenska Miljomal: Miljopolitik for ett hallbart Sverige 1997/98: 145* (Stockholm: Swedish Government, 1997).

16 Swedish Government Bill, *Kemikaliestrategi for Giftfri Miljo 2000/2001:65* (Stockholm: Swedish Government 2001)

17 Swedish State Studies, *Minska gifterna med farliga amnen! Strategi for Sveriges arbete for en giftfri miljo SOU 2012:38* (Stockholm: Fritzes 2012).

18 Swedish Government Bill, *Pa vag mot en giftfri vardag-plattform for kemikaliepolitiken*, *supra* note 10.

19 Swedish Government Bill, *Kemikalie strategi for Giftfri Miljo, supra* note 16.

wording of the "non-toxic environment" objective as follows:

> "The source of substances in the environment that have been created or recycled by society shall not threaten human health or biological diversity. The levels of natural substances are to be close to zero and their effects on human health and ecosystems are to be minimal.[20]"

As the Government itself acknowledges, implementation of this reworded objective is more realistic as promoting a vision of an environment that is free from man-made chemical substances is difficult considering the fact that global chemical production has increased over time. In the same bill the Government noted:

> "The Government has decided: The environmental quality goal "non-toxic environment" means:
> – The total exposure to the work place, in the outdoor environment and indoor environment for especially hazardous substances should be near zero and at levels not harmful to human health for other chemical substances;
> – Contaminated areas are examined and if necessary dealt with;
> – That fish in Swedish seas and lakes are suitable for human consumption with regard to its contents of naturally occurring substances;
> – The definitions within the environmental objective "non-toxic environment" should be re-examined in its entirety.[21]"

Because of the difficulties in meeting the "non-toxic environment" objective, the Government concluded that in future the Swedish regulatory bodies (and in particular the Swedish Chemicals Agency which is responsible for implementing the "non-toxic environment" objective) should work more proactively with like-minded European Union (EU) member states, the European Commission and the European Parliament in pushing for stricter chemical regulatory policy. At the same time as the bill was passed, the Government established a Parliamentary Committee, going under the name of "Miljovardsberedningen" (the All Party Committee on Environmental Objectives-the Committee). The Committee will be active until 2020 and will produce relevant reports on Sweden's progress in reaching its environmental objectives.

Since 2010 this Committee, along with the Swedish Chemical Agency, has been highly proactive in putting forward ideas and suggestions as to how the "non-toxic environment" can best be reached. For example, in 2010 it suggested that the Government should, via the Committee, develop a long-term international strategy for Sweden's activities within the "non-toxic environment" objective including a focus on pharmaceuticals in the environment[22]. The Government agreed to this in June 2011[23]. Similarly, in 2010 the Environmental Ministry allocated 100 million Swedish crowns (£10.5 million) to the Swedish Chemicals Agency to develop and conduct a national strategy on how to reach the "non-toxic environment" objective. According to the Environmental Minister at the time, Andreas Carlgren, the goal of this strategy was to identify hazardous substances and phase them-out[24]. In March 2012 the Swedish Chemical Agency published a document on EU regulations that directly affect EU-wide chemical control policy, with a clear objective that the Committee could use this document as background material for its own work on how best to influence EU legislation in this area[25]. Three months later, in June 2012, the Committee itself published its much awaited report entitled "Minska riskerna med farliga amnen!" (Reduce the risks of hazardous substances). The main conclusion from this study was that even the new watered down "non-toxic environment" objective for 2020 will not be reached. However, the Committee took the view that in order to get as close as possible to reaching the goal, the precautionary and substitution principles, together with hazard classification regulatory mechanisms, should be used as much as possible. The Committee concluded that it needed:

> "To remove the shortcomings, mainly in EU legislation, that impede the realisation of the environ-

20 Swedish Government Bill, *Svenska miljomal-for ett effektivare miljoarbete 2009/10: 155* (Stockholm: Swedish Government 2010), p.111.

21 Swedish Government Bill, *Svenska miljomal for ett effektivare miljoarbete, supra* note 20, p. 112.

22 Swedish State Studies, *Handlingsplan for att utveckla strategier I miljomalssystemet SOU 2010:101* (Stockholm: Fritzes 2010).

23 Swedish Government, *Kommittedirektiv: Tillaggsdirektiv till Miljomalsberedningen Strategi for en giftfri miljo. Dir 2011:50* (Stockholm: Swedish Ministry for the Environment 2011)

24 A. Carlgren, "Satsning for en giftfrivardag", *Svenska Dagbladet* 22nd December 2010.

25 Swedish Chemicals Agency, *Battre EU regler for en giftfri miljo* (Sundbyberg, Sweden: Swedish Chemicals Agency 2012).

mental quality objective of a non-toxic environment and to ensure that the implementation of the current legislation is carried out"[26].

In addition, the Committee felt, as a short-term goal, that significant changes needed to be made to the EU regulation concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH). This in turn would improve chemical safety still further and stimulate innovation. In effect, the report advocated a "REACH ll" and recommended that the Swedish Chemicals Agency should promote this. The report was welcomed by the Swedish Society for Nature Conservation. The Secretary General, Dr. Mikael Karlsson, noted that:

"The political officials [ledamoterna] in the Committee are once again in agreement across political party boundaries and have put forward a strategy for a non-toxic environment that, if implemented, is an important step toward achieving the objective successfully"[27].

Industry's response was more muted. The industry expert on the Committee, Inger Stromdahl, of the Swedish Industry Association noted:

"I see the suggestion of a harmonization of long-term chemical control policy on the EU level positively, but also see the need for increased harmonisation at the global level to ensure the safe handling of chemical products and goods"[28].

Her greatest concern with the report was the development of a REACH legislation, which she felt was not realistic and hence unnecessary.

Also in June 2012, the Swedish Chemical Agency published a further study on how the Agency plans to tackle the "non-toxic environment" objective. The main recommendations of the report were:

- The need for a substantial investment in environmental toxicology research in Sweden;
- That the Government should give the Swedish Chemicals Agency a research budget in order to establish long-term relationships with the research community and for academia to assist in reaching the "non-toxic environment" objective;
- That the Government conducts an evaluation on how best to establish a national centre for risk analysis and toxicology at an existing university;
- That more funds are put into bio-monitoring with a specific focus on hazardous substances in blood, breast milk, and umbilical-cord blood;
- That the Government conducts an evaluation on the need to establish a national knowledge centre for the increased substitution of hazardous substances"[29].

These three influential reports were put out for public consultation. The Environmental Ministry sought comments from other Government agencies, regulatory bodies, councils and other stakeholders (such as industry associations, environmental NGOs and universities) who have an interest in environmental policy making. The Swedish Environmental Ministry received more than 70 public comments, of which the vast majority supported the work of the Committee and the Swedish Chemicals Agency, with groups arguing, for example, that the precautionary and substitution principles should continue to form the basis for future work in reaching the "non-toxic environment" objective [30]. The most critical organisations were the Swedish Plastics and Chemicals Federation, the Confederation of Swedish Enterprise and particularly the Swedish Cosmetic, Toiletry and Detergent Association, which concluded that in its opinion the study was inadequate as the terminology used in it showed a lack of knowledge and that therefore it should not serve as a basis for future environmental policy[31]. Based on these three reports and the comments received by the public consultation exercise the Swedish Environmental Ministry published a Government Bill on chemical policy in November 2013. This Bill more or less endorsed both the All Party Committee's as well as the Swedish Chemical

26 Swedish State Studies, *Minska riskerna med farliga amnen! Strategi for Sveriges arbete for en giftfri miljo, supra* note 17, p.34.

27 M. Karlsson, "Sarkilt yttrande av sakkuninge Mikael Karlsson", in Swedish State Studies, *Minska riskerna med farliga amnen! Strategi for Sveriges arbete for en giftfri miljo, supra* note 27, p.184.

28 I. Stromdahl, "Sarkilt yttrande av sakkuninga Inger Stromdahl", in Swedish State Studies, *Minska riskerna med farliga amnen! Strategi for Sveriges arbete for en giftfri miljo, supra* note 27,p. 186.

29 Swedish Chemicals Agency, *Handlingsplan for en giftfri vardag-forslag pa atgarder* (Sundbyberg, Sweden: Swedish Chemicals Agency 2012), p. 2.

30 Stockholm City Council, "Remissvar till Miljomalsberedningens delbetankande minska riskerna med farliga amnen, Kemikalieinspektionens rapport battre EU-regler for en giftfri miljo och Kemikalieinspektionens delrapport Handlingsplan for en giftfri vardag" (Stockholm: Swedish Ministry for the Environment 2012).

31 Swedish Cosmetic, Toiletry and Detergent Association, "Remissvar till Miljomalsberedningens delbetankande minska riskerna med farliga amnen, Kemikalieinspektionens rapport battre EU regler for en giftfri miljo, och Kemikalieinspektionens delrapport Handlingsplan for en giftfri vardag" (Stockholm: Swedish Ministry for the Environment 2012).

Agency's reports arguing for among other things that the phase-out and substitution of dangerous chemicals needs to be sped up and that greater knowledge and research is needed especially with regard to the health effects that hazardous chemicals have on children[32].

In summary, one can conclude that the Environmental Ministry will not reach its "non-toxic environment" objective by 2020. The Ministry, however, has instead suggested a range of measures that will help it to get close to this objective. These will continue to be primarily based on the precautionary and substitution principles. One key international goal is to engage to a greater degree with like- minded European nations (such as Denmark) to get a wider more international "buy in" to develop stricter chemical control policies, including the possibility of a more innovative, and more inclusive, regulatory framework in the form of REACH ll. Indeed, this is something that the present Environmental Minister, Lena Ek, is already doing. For example, in one interview with an EU news and policy website (EurActiv) journalist she noted that the precautionary principle had long been a pillar in Swedish environmental policy and that that REACH needed to be improved[33].

One of the consequences of pushing even more strongly for this difficult to reach "non-toxic environment" objective is that it is currently causing inconsistent environmental policy making. This is addressed in the next section.

III. The lack of regulatory consistency with regard to environmental policy in Sweden

In conducting research for this article, it became clear that one of the problems associated with current Swedish environmental and chemical control policy making in general is the apparent lack of consistency and clarity. The outcomes of such regulations is that the Government appears to be spending more funds chasing yet another tiny risk in the chemical sector while playing down, the risks in the other areas with possibly negative environmental and public health consequences. There are a number of examples of this in current Swedish public health and environmental policy. I will highlight two.

1. Fermented herring

Eating fermented herring from the Baltic Sea has long been regarded as a Swedish cultural tradition. This tradition was, however, threatened in 2001 when the European Commission Scientific Committee on Food suggested a regulation that set maximum levels of contaminants including dioxins and furans in food stuffs, including fish[34]. Sweden and Finland were aware that this regulation would lead to a ban on the consumption of fatty Baltic Sea fish, especially fermented herring as well as salmon, as they contain high levels of dioxin caused in part by the large amount of effluent from the many pulp and paper mills located along the Swedish and Finnish Baltic Sea coasts. As a result, both governments challenged the ban using risk assessments as their primary tool. The results from these risk assessments indicated that the benefits of eating contaminated fish (for example Omega 3s) outweighed the risks of increased dioxin consumption[35]. Partly based on these risk assessments the Swedish and Finnish Governments persuaded the European Commission to provide them with an exemption until 2006 and then 2011 on two conditions:

i. The Baltic Sea fish would only be consumed locally and would not be exported to any other EU nation;
ii. Finland and Sweden would promise to develop a communication programme warning women of child bearing age and children about the dangers of eating these contaminated fish in order to minimise their consumption.

In 2011 the Finnish and Swedish governments were granted a permanent exemption as long as the conditions continued to be met, something that a num-

32 Swedish Government Bill, *Pa Vag mot en giftfri vardag-plattform for kemikaliepolitiken, supra* note 10.

33 H. Jacobsen, "Swedish Minister: REACH must be improved", *EurActiv*, 28th March 2013.

34 Scientific Committee on Food of the European Commission, *Opinions of the Scientific Committee on Food on the risk assessment of dioxins and dioxin-like PCB in food* (Brussels: European Commission 2001).

35 A. Hanberg, M. Oberg, S. Sand, P. Darnerud and A. Glynn, Risk assessment of non-developmental health effects of polychlorinated dibenzo-p-dioxins, polychlorinated dibenzofurans and dioxin-like polychlorinated biphenyls in food (Uppsala, Sweden: Swedish Food Agency).

ber of European Parliamentarians disagreed with[36]. This was welcomed by the Swedish Rural Affairs Minister, Eskil Erlandsson when he noted on 8th April 2011 that this exemption would safe-guard some 400 fishing jobs along the North Baltic Sea Coast[37] as well as 35 million Swedish crowns in annual fishing income.

There were, however, several problems with Erlandsson accepting the exemption. Firstly, the Swedish Food Agency, the body that had been asked to provide a scientific rationale to the Government to accept or decline the exemption, opposed to the permanent exemption. In its analysis it concluded that there would be a risk that some women of child bearing age and children would consume large amounts of dioxin[38]. The Agency's stance was supported by a statistically-significant study (with a sample of 4000) it had commissioned which showed, for example, that only 35 per cent of parents with small children had much knowledge about the Agency's guidance with regard to the consumption of fatty fish from the Baltic Sea[39]. To further complicate matters, an independent study commissioned by the Agency showed that in the Northern Counties of Sweden (such as Angermanland, Vasterbotten and Norrbotten), if the exemption was made permanent, several thousand more children and women of child-bearing age would go over the recommended tolerable daily intake of dioxin than had the exemption not been accepted [40].

2. Radon in homes

Sweden has a substantial radon problem. Recently, a number of Swedish schools reported radon levels of 3200 Bequerels per cubic metres air. Current guidelines for new-build homes are set at 200 Bequerels per cubic metre, while for existing homes the guidance is set at 400 Bequerels. At the same time radon gas, to which individuals are mostly exposed in their own homes, is the second biggest cause of lung cancer (after smoking) in the country. Recently, the Swedish Radiation Safety Authority calculated that of the 3,500 annual cases of lung cancer some 450 cases are caused by exposure to high levels of radon gas [41]. Studies indicate that for every 100 Bequerels per cubic metre of air, lung cancer increases by 16 per cent. In 2009, the World Health Organisation (WHO), concluded in a major study on radon that there should be an upper exposure limit of 100 Bequerel per cubic metre of air which was 50 per cent lower than the then current Swedish guidance[42]. In January 2010 the Swedish Housing Administration, Boverket, conducted an economic analysis to see whether it would make economic sense to meet the WHO guidance. It concluded that approximately 400,000 small domestic dwellings and 230,000 flats had radon levels between 100-200 bequerel per cubic metre of air, and therefore a proposed clean-up of these dwellings would affect 1.3 million individuals. The costs of the proposed radon clean-up was estimated at a one off of 14-19 billion Swedish crowns and an annual cost of an additional 500 million crowns to cover maintenance and other running costs, and would only save some 40 lives per year. As a result, Boverket rejected calls to reduce the upper exposure limit to 100 Bequerels per cubic metre of air, arguing that the costs for both the State (which pays up to half the cost in reducing radon exposure) and the home owner him/herself would be prohibitively expensive from a value-of-life perspective[43].

So why are the Swedish authorities not concentrating their resources on reducing radon exposure in people's homes and schools? The risks are real, and unlike the present chemical control discussions, the science is certain. The primary reason is that the public in Sweden like in other nations do not perceive the gas as especially hazardous[44]. Radon gas is

36 J. Eriksson, "Surstroming doftar battre an Brysselbyrakrati", *Svenska Dagbladet*, 16th August 2012.

37 E. Erlandsson, "Speech on the Swedish exemption with regard to the consumption of fatty fish from the Baltic Sea" (Stockholm: Ministry of Rural Affairs 8th April 2011).

38 Swedish Food Agency, *Redovisning av regeringsuppdrag rorande gransvarden for langlivade miljofororeningar I fisk fran Ostersjoomradet* (Uppsala, Sweden: 2011).

39 Novus, "Rapport om svenskens kunskap om kostrad om miljogifter I fisk-appendix 3", in Swedish Food Agency, *Redovisning av regeringsuppdrag rorande gransvarden for langlivade miljofororeningar I fisk fran Ostersjoomradet, supra* note 38.

40 A. Glynn, S. Sand, and W. Becker, "Risk och nyttavardering av stromming/sill fran Ostersjon och laxfiskar fran Ostersjon, Vanern och Vattern-Appendix 2". In Swedish Food Agency, *Redovisning av regeringsuppdrag rorande gransvarden for langlivade miljofororeningar I fisk fran Ostersjoomradet, supra* note 38.

41 Swedish Radiation Safety Authority, *Halsorisker med radon* (Stockholm: Swedish Radiation Safety Authority 2012).

42 WHO, *Handbook on Indoor Radon-A public health perspective* (Geneva: WHO) 2009).

43 Swedish Housing Administration, *Radon I inomhusmiljon-en konsekvensanalys av att infora WHO's nya rekommendationer pa radonvarden* (Karlskrona: Swedish Housing Administration 2010).

44 P. Slovic, *The Perception of Risk* (London: Earthscan 2000).

perceived as a natural and voluntary hazard that is familiar, fairly easy to control and easy to understand.

IV. Possible reasons for scientifically inconsistent regulation

As seen in the examples above, there is no clear scientific rationale as to why some environmental issues should be prioritized by regulators over others. So why has Sweden prioritized the rather complicated and difficult to implement "non-toxic environment goal" over stricter controls on the consumption of fermented herring and salmon from the Baltic Sea? There are a number of possible explanations for this.

1. Sweden's underlying research expertise

Globally, Sweden is seen to be at the forefront research wise when it comes to environmental chemical regulatory and toxicological research. This has been the case now for more than 40 years, due to Swedish discoveries about the causes of acid rain, the environmental consequences of the widespread use of DDT in pesticides, and the work by the Swedish researcher and environmentalist Bjorn Gillberg who received national attention when he showed on primetime television that he could wash his clothes using a coffee cream substitute called Pradd [45]. Such research continues to the present day, with Professor Ake Bergman at Stockholm University being instrumental in our broader understanding of the bioaccumulation associated with the use of certain brominated flame retardants[46]. Such research findings lead to international reputations being formed and naturally attract further successes and more funds. Hence, Swedish research foundations spend significant amounts of funds on eco-toxicological research, and a number of large research units have been set up to work on these issues.

2. The attractiveness of certain research topics

Studies in the area of risk perception have for the past 40 years shown that the public perceive some risks as more dangerous than others. The public, for example, are more worried about involuntary risks than voluntary ones, unfamiliar risks than familiar ones, risks that are seen to be technological rather than natural and risks that affect children rather than adults[47]. These same risks tend to be amplified by the media (including social media)[48]. It is, therefore, not surprising that in Sweden greater attention is focused on chemicals such as BPA, which are seen by the public as involuntary, unfamiliar, technological which affect children, than on outbreaks of salmonella or campylobacter food poisonings which are perceived as certain, familiar and natural. What is especially interesting is that certain media such as the well-respected daily newspaper, *Svenska Dagbladet*, have made itself almost an anti- BPA platform.

3. Certain environmental politics can be vote winners

In Sweden, as in many other countries, political parties promote particular environmental policies in order to gain publicity and votes. For example, in the 1979 general elections the Centre Party, partly in the wake of the Three Mile Island nuclear power accident, embraced a strong anti-nuclear platform. This helped the party, along with its right-of-centre coalition partners, to win the election[49]. Similarly, the 1988 elections were considered the "green elections" with a quarter of all election coverage discussing green issues[50] and 46 percent of the population noting that the environment was the most important issue of the general election campaign. This in turn lead to the newly-formed Green Party to enter the Swedish Par-

45 L. J. Lundgren, *Forsurningen pa dagordningen: En bild av handelseforlopp 1966-1968*, supra note 4.

46 See, for example, L. Birnbaum and A. Bergman, "Brominated and chlorinated flame retardants: The San Antonio statement", 119 *Environmental Health Perspectives* (2011), p.A11.

47 For excellent examples see B. Fischhoff, P. Slovic, S. Lichtenstein, S. Read and B. Combs, "How safe is safe enough? A psychometric study of attitudes towards technological risks and benefits", 9 *Policy Studies* (1979), pp.127-152 as well as P. Slovic, "Perception of risk", 236 *Science* (1987), pp. 280-285.

48 R. Kasperson, O. Renn, P. Slovic et al, "The social amplification of risk: A conceptual framework", 8 *Risk Analysis* (1988), pp.177-187.

49 S. Holmberg and K. Asp, *Kampen om Karnkraften-en bok om valjare, massmedier och folkomrostningen 1980* (Stockholm: Publica 1984)

50 K. Asp, "Medierna och valrorelsen", in M. Gilljam and S. Holmberg eds., *Rott, Blatt, Gront: En bok om 1988 ars riksdagsval* (Stockholm: Bonniers 1990).

liament[51]. Today, the current environmental debate is about whether the Centre Party, which has decreased in popularity in recent public opinion polls, can be more tough on chemicals in terms of proposing new regulations than the opposition centre- left Green Party.

4. Economic consequences of the proposed regulatory policies

Studies show that it is always easier to promote tough regulations whether in the environment, food or health sector if the economic costs to society are low[52]. It therefore makes sense for the Austrian government to express concerns about genetically modified foods and establish "GMO free" zones throughout the country, as none of the large GMO multinationals, such as Monsanto, are headquartered in Austria. Similarly, Sweden has a tiny chemical industry and hence can afford to promote one tough anti-chemical regulatory policy after the other with little or no consequence to the Swedish economy[53]. Where measures do have significant economic consequences, however, Swedish policy makers have quickly chosen not to implement them, as witnessed by the fermented herring and radon examples discussed earlier.

5. Lack of a proper scientific debate in the chemical control area

Compared to a number other western nations such as the UK or the USA [54], there has not been an adversarial debate regarding chemical control policy in Sweden. Other regulatory authorities, stakeholders, university professors and for the most part the regulated industry itself seem, in public at least, to accept the conclusions. As one anonymous industry spokesperson noted:

> "Having a proper evidence-based and risk-informed debate on the Allparty Committee's rather radical and ill-informed proposals with regard to reaching the government's "non-toxic environment" objective is very difficult for us. We do not want to put our heads above the parapet and get hit by the powerful NGOs and other bodies. We lose public trust and political respect with very little gain. We prefer to reach out and gather a consensus and keep our mutterings private." (Anonymous industry spokesperson March 2013)

The same is arguably the case for the Swedish Food Agency, which has been from time to time attacked by the Swedish Environmental Ministry, NGOs, and *Svenska Dagbladet*, for being too close to industry and not being radical enough with regard to its regulation of BPA in food products. Although a number of individuals within the Agency have indicated privately that they were disturbed about these attacks, noting that they were politically motivated, they have not publicly defended themselves via opinion editorials or letters to the editor.

V. Conclusions

Sweden has long been seen as a leader in European chemical control policy. Today the Swedish Environmental Ministry is as active as ever in putting forward one tough chemical regulation after another. This is bound to continue in the foreseeable future primarily because, as discussed in this paper, there are few domestic economic consequences for the Ministry's radical chemical stance and because of the lack of scientific as well as popular debate on the topic.

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51 M. Bennulf and S. Holmberg, "The green breakthrough in Sweden", 13 *Scandinavian Political Studies* (1990), pp.165-184.

52 J. Zander, *The Application of the Precautionary Principle in Practice: Comparative dimensions* (Cambridge: Cambridge University Press 2010).

53 R. Lofstedt, "Risk versus hazard-How to regulate in the 21st Century", 2 *European Journal of Risk Regulation* (2011), pp149-168.

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