

## **Greening of Industry Network Conceptual Paper**

**Title paper:**

**‘Corporate Sustainability: an analysis of learning processes  
in the management of chemicals giving rise for concern’**

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**Abstract**

Organisations presently confront choices about their role in society. Through the process of globalization, multinational organisations are now active in many countries with many different norms, values and beliefs. In their search towards a new role, approaches like a triple bottom line, accountability, corporate citizenship and corporate governance have emerged. These approaches bring along new paradoxes and questions about what values to embrace. The paper proposes a learning approach to such issues and describes corporate sustainability from an organisational learning perspective.

The paper starts with a discussion on and explanation for the limited changes towards corporate sustainability so far. It calls for an organisational learning approach as developed by Argyris and Schön. It then discusses a framework with organisational learning conditions as developed by Friedman et al. This model builds on the approach of Argyris and Schön and focuses on the cultural conditions for learning. It distinguishes behavioural, psychological, and contextual conditions for organisational learning. Some of these conditions return in literature on corporate sustainability. This model will then be explained in the light of the phase-out of chemical substances in the final section. The paper finishes with a conclusion and some final remarks regarding the further development of the organisational learning environment for corporate sustainability.

## **I. Introduction**

This paper describes corporate sustainability from an organisational learning perspective. Originally, the paper was to present an organisational learning framework for corporate sustainability. However, at the time of writing this paper, the case material - which will be used to further develop this model-, was not analysed yet. To such an extent, the paper reflects a work-in-progress. The purpose of this paper has therefore been reformulated to discussing the usefulness of an organisational learning framework in a corporate sustainability context. For this, the paper uses the phase-out of chemical substances as an example of corporate sustainable behaviour.

Below, the paper starts with a discussion on and explanation for the limited changes towards corporate sustainability so far. It calls for an organisational learning approach as developed by Argyris and Schön which will be discussed in section III. Part IV discusses a framework with organisational learning conditions as developed by Friedman et al. This model builds on the approach of Argyris and Schön and will be explained in the light of the phase-out of chemical substances in section V. The paper finishes with a conclusion and some remarks for discussion.

## **II. Corporate Sustainability : a call for a learning approach**

In the search for a better environmental and social performance of business organisations, it is often argued that a jump or leap is needed in order to bring about the desired change. This is often referred to as a paradigm shift in the way of management thinking (Gladwin, Kennelly et al. 1995). So far, many companies have reached a stage in which the environmental impacts of their processes are under control. For this, most companies use standardized management systems like ISO (Keijzers, Boons et al. 2002). Utting reveals that “[t]he question of why some sectors of business are changing [...] has less to do with a new-found ethical concern among corporate executives for the environmental and social condition of the planet, than with economic, political and structural factors. These include so-called ‘win-win’ opportunities, the possibility of enhancing competitive advantage, ‘reputation management’, pressure group and consumer politics, regulation or the threat of regulation, and changes in the way production and marketing are being organized globally.” (Utting 2000, p. v) The argument here is that these changes fit the existing paradigm and the currently prevalent theories of action. This is underpinned by Roome pointing out that improving the environmental performance through concepts like eco-efficiency, total quality management or product and risk analysis, endorses the anthropocentric and utilitarian ethical system in current business practice (Roome 1997).

Literature provides us with various leads for explaining the limited changes and the ‘business-as-usual’-attitude. The institutional theory holds “[...] that organisations pervasively imitate other organisations because doing so minimizes sanctions from a variety of stakeholders. House and Singh [...] state that mimicry occurs particularly when technologies are poorly understood and when goals are ambiguous” (in: Huber 1991). Since the concept of (corporate) sustainability is poorly understood and rather subjected to the ethical viewpoint

one tends to hold<sup>1</sup>, organisations are likely to imitate each others approaches and strategies in order to minimize the chances for sanctions. Another (related) explanation is the cultural impact on group functioning. It is argued here that the current organisational paradigm has become part of what Schein refers to the basic assumptions of a group culture (Schein 1992). According to Schein, basic assumptions have become so taken for granted that one finds little variation amongst the individuals within a cultural unit. Basic assumptions differ from values in that the latter are negotiable: “Values can be and are discussed, and people can disagree with them; basic assumptions are so taken for granted that someone who does not hold them is viewed as crazy and automatically dismissed”(Ibid, p.16). The institutionalisation of the current paradigm within a group’s basic assumptions then prevents a confrontation or debate about both the current and/or a new paradigm.

In another publication, Schein identifies three cultures of management and argues that two of them, - i.e. that of the managers and that of the technicians -, are part of a global professional community (Schein 1996). These communities share a common world view based on their education, shared technology and work experience. Schein points out that this implies that the reference group of a manager or a technician often lies *outside* the organisation in his or her community of equals. This may strongly differ from what is accepted *inside* the organisation. Changing the current paradigm is therefore even more complicated since the basic assumptions are shared outside the organisation as well and debating them externally will even be more threatening than confronting them internally. In order to enhance organisational learning, Schein argues that every community has to learn how to learn and how to develop new basic assumptions.

Another (again related) lead for explaining the limited changes and the ‘business-as-usual’-attitude can be derived from the work of Peter Senge (Senge 1990). He points out that ‘when placed in the same system, people, however different, tend to produce similar results’ (Senge 1990, p.42). In other words: the systems organisations choose for controlling their processes, strongly influence the behaviour of the organisational members and the behaviour of an organisation as a whole. Argyris and Schön go a step further arguing that people hold theories of action that they use to design and carry out their behaviour in any situation in which they are embedded (Argyris and Schön 1974). These theories of action have to be based on a form of logic, otherwise using them would be creating new theories in every situation. The authors argue that this logic or cognitive basis is therefore modelled and that the organisational system reflects this logic or cognitive basis. Argyris and Schön modelled this logic and called it Model-I. It instructs “[...] individuals to seek to be in unilateral control, to win, and not to upset people. It recommends action strategies that are primarily selling and persuading and, when necessary, strategies that save their own and other’s face” (Argyris 1990, p.13). If organisational members tend to behave according to this logic, and if the systems they operate in reflect this logic, then this raises fundamental questions about the extent to which this logic allows for creating a paradigm shift in management thinking. Given the fact that the work of Argyris and Schön addresses the fundamental basic assumptions of group behaviour and the fact that the authors have modelled this behaviour, their work is discussed in more detail below.

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<sup>1</sup> The kind of ethical framework one tends to hold is of great influence on the outcomes of many sustainability issues like e.g. the use of child labour, the ownership of the ‘commons’, the strategies to resolve conflict, and the rights of current versus future generations.

### III. A theory of action

Argyris and Schön (Argyris and Schön 1974),(Argyris and Schön 1978) have developed several basic concepts for organisational learning; many of them relate to their so called 'theory of action'. "A theory of action is a theory of deliberate human behaviour which is for the agent a theory of control but which, when attributed to the agent, also serves to explain or predict his behaviour" (Argyris and Schön 1974, p.6). Their work seems relevant for corporate sustainability for a number of reasons. First of all, their theory of action distinguishes between an espoused theory and a theory-in-use, providing an understanding for the gap between what organisations, - and people acting on behalf of them -, proclaim (espouse) to do and what they actually do (in-use). Secondly, with the concepts of single-loop learning and double-loop learning, Argyris and Schön provide a distinction between changes *within* the existing paradigm and changes *about* that paradigm<sup>2</sup>: "[...] members of the organisation respond to changes in the internal and external environments of the organisation by detecting errors which they then correct so as to maintain the central features of organisational theory-in-use" (Argyris and Schön 1978, p.18 - *italics* removed). Following the work of Gregory Bateson, Argyris and Schön refer to this organisation's 'ability to remain stable in a changing context' as single-loop learning. This in contrast with double-loop learning, where people or organisations 'learn to change the field of constancy itself.' Thirdly, with their concept of Model-I theory-in-use, Argyris and Schön give an explanation for why organisations are stuck in producing the limited single-loop solutions. Their argument is that the Model-I behaviour which people tend to produce, "[...] reduces long-term effectiveness and capacity for double-loop learning of the presumed dominant behaviour in organisations. [...] Model I theories-in-use held by individuals both create and are reinforced by the Model I features of the behavioural worlds in which those individuals live" (Argyris and Schön 1978, p.60). "In organizational settings, conditions for error trigger Model I reactions. Vagueness and ambiguity in organizational theory-in-use yield organizational situations that individual members, programmed with Model I theories-in-use, find threatening. Uncertainty over the nature of troublesome situations, over what is to be done and by whom, or over criteria for performance, increase individual feelings of defensiveness and mistrust. Incompatibilities in organizational theory-in-use tend to be expressed in interpersonal conflicts, which individuals then live out in terms of win/lose games." (Argyris and Schön 1978, p.65).

A fourth reason for the relevance of the work of Argyris and Schön is that they provide an alternative theory-in-use, called Model-II, advocating an alternative set of governing variables which includes valid information, free and informed choice, and internal commitment. Interestingly, these variables seem to return in one way or another in relation to sustainability as well. This will become more clear below where an elaborated model based on the work of Argyris and Schön is presented. The consequences of Model II "[...] should be an enhancement of the conditions for *organisational* double-loop learning, where assumptions and norms central to organizational theory-in-use are surfaced, publicly confronted, tested, and restructured." (Ibid, p.139) The authors take a systems perspective, and thereby tend to seek a fundamental approach in addressing organisational change; i.e. an approach which

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For this distinction, Argyris and Schön build on the work of Ashby and Bateson. Many other distinctions for learning processes have followed. For an overview, see e.g. Fiol, C. M. and M. A. Lyles (1985). "Organizational Learning." The Academy of Management Review **10**(4): 803-813.

tends to tackle the more fundamental, often hidden issues when dealing with organisational problems.

Concluding, the theory of action provides an interesting concept which seems to be able to explain why organisations and organisational members, who are truly committed to sustainability, end up producing limited results and are unable to learn how to change. Further, it proposes an alternative model which enhances the conditions for double-loop learning and thus, the conditions for paradigm change. In the next section, a map with conditions for organisational learning is discussed. The map builds on Model-II and takes a cultural perspective..

#### IV. Conditions for organisational learning

Building on the Model-II theory-in-use of Argyris and Schön, Friedman, Lipshitz and Overmeer (2001) developed a map with some cultural conditions for organisational learning. The purpose of the map is to provide a set of targets to keep in mind if an organisation wishes to promote or evaluate organisational learning. The map is not intended to be a comprehensive model of the conditions of organisational learning. Bearing this in mind, the model still provides an interesting insight in three categories of cultural conditions for organisational learning. In order to ‘simplify’ the overarching and complex construct ‘culture’, the authors adopt Argyris and Schön’s concept of ‘behavioural world’. This focuses on the elements of an organisation’s culture that facilitate or inhibit learning and is defined as ‘qualities, meanings, and feelings that habitually condition patterns of interaction among individuals within the organisation in such a way as to affect organisational inquiry’ (Argyris and Schön cited in: Friedman, Lipshitz et al. 2001). Friedman et al. then suggest that this behavioural world can be mapped out in terms of contextual, behavioural, and psychological factors. “Behavioural factors refer to the kind of observable actions that are likely to promote organisational learning. Psychological factors refer to the internal states that are likely to facilitate or motivate these actions. Contextual factors refer to those organisational norms or cultures that are likely to create and reinforce these psychological conditions. All these factors are linked by a causal loop” (Friedman, Lipshitz et al. 2001). The three factors consist of various characteristics. The tables below summarize these characteristics for each of the three conditional factors.

<b>Behavioural conditions</b>	
<i>Transparency</i>	: People’s disclosure of their actions, thoughts, and intentions, and of the reasoning behind their opinions and actions as explicitly, clearly, and honestly as possible.
<i>Inquiry</i>	: Persistently digging into a situation (e.g. asking open questions, collecting data, and identifying gaps and contradictions) in order to construct an image of reality that captures its complexity and meaning as well as possible.
<i>Disconfirmation</i>	: The open admission of error or a change of one’s mind when other perceptions or interpretations have been shown to make more sense.
<i>Accountability</i>	: The idea of holding oneself responsible for one’s actions and their consequences, but it also implies taking corrective measures and implementing the lessons learned. In the absence of such knowledge, accountability means experimenting with new behaviours and taking responsibility for the outcomes in order to stimulate learning.

The behavioural characteristics represent remarkable similarities with some of the characteristics of sustainability. Welford and Jones, for example, refer to accountability and

transparency as general principles of sustainability (Welford and Jones 1996). *Transparency* is similar to the Model-II governing variable ‘maximizing valid information’. It is no coincidence that Argyris and Schön regard this as the primary governing variable of Model-II and that Welford and Jones regard it as one of the three general principles of sustainability: it encourages inquiry and public confrontation or testing. “The task of organisational *inquiry* is [...] to specify vague information, to clarify ambiguity, to prune excessive information, to enrich sparse information, to make untestable proposition testable, so that error or anomaly can be linked to inadequacies in organizational theory of action.” (Argyris and Schön 1978, p.57) The function of *disconfirmation* in the model has not been explicitly explained by the authors. It may have to do with demonstrating or confirming what one has learned and by doing so, demonstrating the commitment to learning and transparency. The concept of *accountability* in a sustainability framework involves the same as in a learning framework; i.e. to be able to hold persons and corporations responsible for their actions. However, from a learning perspective, this stimulates learning (again the exact purpose for learning becomes not clear from the work of Friedman), whereas from a sustainability point of view, it enhances fairness.

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### Psychological conditions

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<i>Doubt</i>	Is a precondition of inquiry. Part of doubt is the feeling of not knowing-of being confronted by a situation that presents an impasse, gap, puzzle, contradictions, or some other kind of uncertainty. Doubt, however, can be extremely threatening.
<i>Sense of psychological safety</i>	Psychological safety is necessary to counterbalance feelings of threat and anxiety that may be generated by uncertainty and doubt.

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Psychological factors refer to the internal states that are likely to facilitate or motivate actions. Friedman et al. (2001) argue that *doubt* is a precondition for inquiry. Too much doubt however, will create threat and anxiety. This should be compensated by a *sense of psychological safety*. Related to this is the idea of flow psychology; i.e. the psychology of the optimal experience (reference uncertain: Cornelis 1988?). The idea is then that there is an optimal flow between a person’s challenges and the skills needed to fulfil those challenges. If the challenge is great, and the skills aren’t there, then there will be anxiety. When people have no challenge but many skills, there will be boredom. Since the challenge of sustainability is enormous, people (and organisations of people) are likely to sense doubt and uncertainty, for the skills (of e.g. becoming more transparent, of inquiry, etc.) still need to be developed. Friedman et al. point out that what causes doubt and psychological safety differs from person to person, but it can also depend heavily on the social or organisational context in which organisational actors function. These contextual conditions are presented in the table below.

Contextual factors refer to those organisational norms or cultures that are likely to create and reinforce the psychological conditions. These contextual conditions include a tolerance for admitting error, issue orientation, egalitarianism, and commitment to learning. The authors point out that these are observable ‘to the extent that they are given concrete expression in organisational policies, structure, rituals, and slogans though norms expressed in these ways may be espoused but not necessarily practised’. The idea of *tolerance for admitting error* is that people will experience a greater sense of psychological safety, making it easier for them to experiment and admit error (transparency and accountability) so that they and others can learn from the experience. From a sustainability point of view, this calls for room to let people and organisations experiment (to a certain extent) without damaging them after the

experiment failed. In other words, the model calls for a sense of psychological safety for corporations to experiment without having to be afraid of their corporate or brand image. This emphasises the joint nature of the sustainable development process.

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### Contextual conditions

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<i>Tolerance for admitting error</i>	The organisation will reward, or at least refrain from punishing, people for admitting errors.
<i>Issue orientation</i>	The tendency to base judgments on substance rather than on political interests, status, or personal likes and dislikes. An issue orientation also causes people to cast doubt on their attitudes and prejudices in light of substantive data.
<i>Egalitarianism</i>	This refers to the practices of power-sharing, participation, and equal responsibility for meeting performance standards regardless of formal status. This opens communication channels and thereby promotes innovation and learning.
<i>Commitment to learning</i>	An organisation is committed to learning when it values collective learning either in itself or as an essential activity for survival or effectiveness.

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A similar line of reasoning applies for *issue orientation*. “If people believe that they and others in the organisation will base judgments on substantive criteria, their sense of psychological safety and fairness will increase, and they will be more willing to become transparent” (Friedman, Lipshitz et al. 2001). *Egalitarianism* opens communication channels and thereby promotes innovation and learning. This returns in literature on corporate sustainability as well: Roome calls for product stewardship, and more co-operative forms of action (Roome 1992). Elkington calls for a similar thing when suggesting partnership, and organisational governance and control (Elkington 1997). Egalitarianism raises fundamental questions about the hierarchical system which most organisations are built on. Land, for example, proposes an organisational model in which hierarchy is replaced by self-management and partnership in order to meet the rising market demand of high value adding custom-made service provision (Land 1999). The need for a *commitment to learning* has been widely addressed above.

Although the model is not intended to be a comprehensive model or theory of the conditions influencing organisational learning, it may provide a good basis for the development of an organisational learning environment for corporate sustainability. Besides an interesting learning model, it seems to have interesting characteristics which relate to a small or larger extent to elements of sustainability as well. In order to get a better understanding of the possibilities of this model in a sustainability context, the next section applies the characteristics of the model to one specific aspect of sustainability, i.e. the replacement of raw materials.

## V. The phase-out of chemical substances

In this section, the model will be applied to the (voluntarily) phase-out of chemical substances giving rise for concern, either because of knowledge, or for a gap in such knowledge<sup>3</sup>. This section functions as an exercise in making the model operational for analysing change

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In order to avoid repeating the entire sentence, explaining the nature of the substances, the context of the substances involved is simply referred to here as SOMS, after the Dutch policy memorandum on this topic (Strategy On Management of Substances).

processes regarding corporate sustainability. Since sustainability is such a broad concept, a focus will be necessary in the empirical research. Here, this focus is on the phase-out of chemical substances as part of a (sustainability) strategy on the use of raw materials. Below, the section starts with a brief introduction on the background of the project which was used for gathering the data on this topic. Then the learning conditions will be discussed in terms of a macro-context of the phase-out of chemical substances.

On 22 March 2001, the Dutch Minister for Housing, Spatial Planning and the Environment presented the policy memorandum 'Strategy On Management of Substances', proposing a new chemicals policy.

"The strategy memorandum [SOMS] speaks of the concerns in society regarding the safety of our living and working environments. It establishes that society was- and still is- far removed from a firmly entrenched approach to responsible chemicals management. The threat that this situation poses in regard to the safety of people and their environment has spurred a range of initiatives for modernising the present chemicals policy." "The policy innovation in relation to substance management aims, [...] to create and sustain a clean ecological environment and safe and healthy living and working conditions.

[...]

Purpose of the new policy is to minimize risks from these chemicals by introducing the precautionary principle. Also, the Dutch government aims to make business responsible for gathering the required data and for evaluating them in terms of human and environmental impact."

(VROM 2001)

Through TNO-work and employment<sup>4</sup>, the author is involved in a project concerning SOMS. In dialogue with the Dutch ministry for Environment, Housing and Spatial Planning, TNO has initiated a research programme to investigate the complex evaluations and associated decision making processes concerned with these non-assessed chemicals. The programme consists of various sub projects. One of them deals with getting a better understanding of the organisational processes related to the non-assessed chemicals by means of a number of case studies of past or present phase-outs of chemical substances. At this stage, a number of interviews were held at three different companies. At the time of writing this paper, the case descriptions were not authorized yet, nor translated from Dutch into English. Also, the gathered data have not been collected based on the model. Therefore, the following section does not reflect individual (organisational) cases, as was originally intended, but rather a macro perspective of the SOMS policy innovation. However, the tables present some of the issues for analysing the process at a company level.

### **Behavioural conditions in SOMS**

Transparency and inquiry are key topics in the SOMS-project. Part of the purpose of the first phase of the implementation of the new policy is, 'to fill the knowledge gap that exists with regard to the risks and hazards associated with substances, and to enable adequate measures to be taken as soon as is practically possible' (VROM 2001, p. 6). This has to be accomplished by the implementation of a 'Quick Scan', which serves to identify the hazardous properties of substances, and which is to cover *all* substances produced, traded or

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The author's phd-research is partly financed by TNO-Work and Employment. TNO is a Dutch research institute for applied research.

used in the Netherlands. The 'Quick Scan' is to result in "[...] the availability of independently validated substance profiles containing essential hazard **information**, per individual substance, in relation to persistence (P), bioaccumulation (B), (eco)toxicity (T), health damage in humans (He), carcinogenicity (C), mutagenicity (M), reprotoxicity (R) and hormone disruptive effects (Ho)." (VROM 2001, p.7) Interestingly, the quotation highlights the word 'information'. The reason for this may lie in a call for distinguishing it from 'data', which usually refers to the factual numbers. Information refers to the interpretation of the numbers; i.e. what does it mean for the use of the substance in terms of their environmental and human impact. From this viewpoint, information is more transparent, since it leaves less or no room for interpretational differences. From a learning point of view, focussing on gathering information rather than data, increases doubt for those actors responsible for gathering the information. This may enhance inquiry but it may also increase threat.

One of the main problems in filling the knowledge gap is the willingness or the commitment of the chemical industry in disclosing the desired information. This disclosure comes with many uncertainties about the consequences. The model therefore suggests a sense of psychological safety to be created in the implementation of the new chemicals policy. In an organisational context, this sense of safety may be more referring to an economical and legal sense of safety. It is likely that organisations are more willing to be transparent about their data when they have the assurance that they will not be legally held liable for the errors in past behaviour. Some sort of 'Superfund' for financing liability suits may then stimulate the disclosure of information. This may especially apply to the basic chemicals manufacturers, since they are the most vulnerable.

Many chemical substances are made out of other chemicals, i.e. the basic chemicals (or already a mixture of those). As long as the changes in the properties of a chemical remain within certain boundaries, it will not be defined as a new chemical. Therefore, one will not have to go through the entire range of tests as those mentioned above. The consequence of this is, that the gathering of information on the properties of the chemical products mainly rests on the manufacturers of the basic chemicals. Downstream users of the chemicals largely depend on the information supply of their suppliers.

Another issue here is the extent to which organisations are able to disclose information on the substances without disclosing their core competences? On one hand, communicating allows stakeholders to feedback on the organisational action in an early stage. On the other hand, disclosing (so far) confidential information allows others to 'have a look in the organisational kitchen'. Organisations need to learn to disclose information in such a way that its stakeholders are satisfied and the organisational competitive edge is safeguarded. Can a paint manufacturer disclose its recipe for the paint it produces? Can it disclose information on the substances used without giving away the recipe? Is there a need for giving away the ingredients used? Or is it sufficient to communicate how the chemicals should be used, e.g. in terms of 'use in well ventilated areas', 'no open fires allowed', 'wear protected clothing', etc.

The table presents some of the issues for analysing the process at a company level.

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### Behavioural conditions in an organisational context of the phase-out of substances

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<i>Transparency</i>	How and what do organisations communicate about their products? To what extent are organisations prepared and enable to communicate about the substances ? What actions do organisations take regarding the disclosure of information on the substances they use and produce?
<i>Inquiry</i>	Are organisations taking action in order to collect the data on the substances they use? How do organisations deal with differences in interpretations and perceptions of the risks of substances involved?
<i>Disconfirmation</i>	How do organisations react when scientific data argues against the use of the substance they produce or use? Do organisations openly admit error or a change of their mind when other perceptions or interpretations have been shown to make more sense. What are the motives for (not) doing so?
<i>Accountability</i>	Do organisations regard themselves as accountable? Do organisations experiment with new behaviour like involving other actors / stakeholders ? Do they involve other research institutes to collect information? Do they act on the outcomes of those involvements?

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### Psychological conditions in SOMS

As discussed above, a psychological sense of safety will be very important. There will be much doubt about responsibilities, liability and economic impacts in terms of losing sales when products will have to be withdrawn from the market. Also the image of the chemical industry plays an important role in the willingness to cooperate in the implementation of the new chemicals policy. Even if the economical part of liabilities will be settled on forehand, creating a sense of safety, the risk of damaging the industry's image (again) will still be a great barrier to overcome. Although it will be impossible to guarantee a sense of safety on this matter, one might consider some sort of agreement between the industry, the (environmental) ngo's, and other relevant actors in order to work together and create a mutual understanding in the process (which in the end is in the interest of all). Creating a mutual understanding stimulates a sense of safety since the past action strategies can be easier understood, explained and communicated. For a start, one might e.g. work on combining the various perceptions into a single, more generalized map of the chemical industry, shifting the focus away from blaming individual organisations to the dynamics of the system as a whole. This is in line with Argyris and Schön, suggesting a joint control of the task in order to minimize defensive interpersonal relations and group dynamics (Argyris and Schön 1974). Similarly, Friedman et al. suggest a joint control of the learning process to foster the sense of psychological safety (Friedman, Lipshitz et al. 2001).

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### Psychological conditions in an organisational context of the phase-out of substances

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<i>Doubt</i>	What will be the impact of disclosing data in terms of the organisational product-market combinations, image, economical impact, liability ?
<i>Sense of psychological safety</i>	How can organisations create their own sense of psychological safety? What can be the role of a stakeholder dialogue in this? How can they create this kind of safety for others (e.g. down-stream users for the basic chemical manufacturers)?

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Another key challenge in the phase-out of substances is to help organisations and organisational members to wrestle with their uncertainties and help them experiment in creating a sense of psychological safety for disclosing the data on their substances. There may be a role for research institutions in this field.

## Contextual conditions in SOMS

The model suggests the creation of a contextual environment in which there is a tolerance for admitting error. More specifically this refers, for example, to how the environmental movement responds to organisations who disclose information. The model suggests that a blaming (punishing) attitude will slow the process down.

The issue orientation suggests that the discussions on the risks involved in the use of the chemical substances, will have to be based on substantive criteria and not on aspects like political interests, etc. Since the policy innovation is a political issue, this may be very difficult to accomplish. The model also suggests that communications within and perhaps also outside the product chain stimulates innovation. For downstream users this may be easier to address. However, for the basic chemical manufacturers it will be more important to address since they not merely may have to find alternative materials, but may even have to find a new core business.

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### Contextual conditions in an organisational context of the phase-out of substances

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<i>Tolerance for admitting error</i>	What happens to people who question the status-quo, e.g. those who question the use of a certain substance or propose an alternative which is not made by the organisation?
<i>Issue orientation</i>	How can organisations (organisational members) create and maintain an orientation on the replacement of substances of concern? How can they maintain a dialogue on this without parties starting to behave defensively? What is the role of the network the organisation operates in?
<i>Egalitarianism</i>	How can the task of gathering the data, and acting on its consequences be controlled jointly? How can all parties be treated as equals? What will be the consequences of that treatment?
<i>Commitment to learning</i>	How do organisations demonstrate their commitment to learning?

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## Conclusions and final remarks

This paper presented an organisational learning model which was somewhat experimentally applied to the phase-out of chemical substances. The model represents similarities with some of the elements mentioned in literature in relation to sustainability. To some extent these similarities exist because the literature on sustainability seems to adopt a learning approach. But sustainability also includes some of the elements of the model because of the normative nature it represents (e.g. fairness). Although the paper did not get to this stage, the model will be used for the development of an organisational learning environment for corporate sustainability. The idea is to use the data from the chemical phase-out project for further development of this (so far) mental model and use literature to support and refine the model. For the interested reader, the current (mental) learning model the author is working with is presented in the appendix.

The application of the model to the phase-out of chemical substances was rather experimental and leaves room for improvements. The original intention to go a step further in analysing, i.e. analysing the individual organisational case material-, will be needed for drawing conclusions about its ability to contribute to the development of a learning environment for sustainability. Nevertheless the application demonstrated the complexity of the phase-out process involved. The model also raised some directions for stimulating that process. Much

of them have to do with creating a sense of psychological safety for the chemical industry. Since these have not been tested, these leads are merely hypothetical (though based on theory). Creating a mutual understanding about the complexity of the phase-out of a chemical and about the chemical industry in general, may help in creating a sense of safety, and improving a tolerance for admitting error. Communication, cooperation and dialogue seem key aspects in the implementation of the new chemicals policy.

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# Appendix

## A mental model of an organisational learning framework for corporate sustainability



