



Principles for
a toxic free environment



Chemicals policies are increasingly focusing on the hazardous properties of chemicals and aiming for a toxic free environment. But what does this mean and how can it be done?

This booklet aims to give a basic understanding of these concepts and the principles that need to be included in the process. When consistently applied, they create the basis for a safer handling of chemicals, a policy truly aiming to avoid negative effects on human health and the environment.

Anyone for cocktails?

We are all exposed to chemicals continuously in our daily lives. There are 100 000 chemical substances registered in the EU and on a daily basis citizens are exposed to hundreds or thousands of them. We inhale them, eat them and drink mixtures of them – like cocktails – all the time without knowing what they are doing to us.



Concerning effects on human health, an OECD study of the 1500 most common substances concludes that only a minor part had been adequately examined. Ten percent had not been examined at all. Regarding effects on the environment, virtually none of them had been thoroughly examined.

This long-term exposure to low levels of chemicals has serious negative impacts

on human health and the environment. Data from the industrialised world show that certain forms of cancer and other disabilities are increasing rapidly. It has not been possible to positively connect this development with specific chemical substances, but few scientists doubt that there are links to the increasing long-term exposure to chemicals.

Substances that break down slowly are particularly problematic. Once released

into the environment, they may cause unpredicted problems for a long time. PCB is an example of such a substance. Despite it being banned in some countries thirty years ago, it still creates huge problems in these places.

Some chemical substances have the ability to stay in the fat in our bodies once we have inhaled or swallowed them. They accumulate, building up higher levels all the time. From the fat they are released to human breast milk and passed on to our children. Hundreds of man-made chemicals can be found in human milk in most parts of the world.

Some of them are endocrine disrupters, having effect on the hormone system. They may, for instance, cause developmental problems in the early lives of humans.

To make the picture even more complex, when chemicals break down in the environment they give rise to new substances with properties and effects we have no way of predicting. The fact that humans and the environment are exposed to a myriad of chemicals simultaneously increases insecurity further.

Humans and the environment are continuously exposed to low doses of thousands of chemicals. However, we know very little about their safety and cannot predict the effects on human health or the ecosystem.

A dead end

Throughout the world, policies for regulating the production and use of chemical substances have been based on the same concepts for centuries. They were developed in a time and age when the use of chemicals was very limited and knowledge about their effects was scarce.

First of all, it was assumed that human health and the environment could tolerate the influence of chemicals.



Secondly, when it became apparent that chemicals could do quite a lot of harm, it was assumed that there were safe levels. Humans and the environment would be safe if the levels of exposure could only be controlled.

Thirdly, it was assumed that any chemical substance that a manufacturer wants to produce should be considered harmless until the opposite could be scientifically proven. And it has been up to society to prove it.

Although there is little or no scientific basis for these assumptions, they became pillars of chemicals policies worldwide and remain so today in most places. Together with the dramatic increase in the production of chemicals and the development of thousands of new sub-

stances, these assumptions have created an unsustainable situation. While vast resources are spent trying to foresee the unforeseeable and control the uncontrollable, human health and the environment are taking the toll. Chemicals are being used in great quantities and spread all over earth without understanding the consequences. Modern society has inherited regulation based on ignorance.

Regulators and the chemical industry stand at a dead end, where the old concepts have ceased to work and new approaches are needed.

Therefore scientists, politicians, NGOs and progressive industry worldwide are calling for the adoption of new chemicals policies based on scientific facts and realistic concepts.

One example of this is the declaration made by governments around the North Sea to eliminate all releases of hazardous substances to the marine environment by the year 2020. Another example is the demand made in 1998 by governments in the European Union for a new chemicals policy and the successive development of a new chemicals policy in the EU.

Risk management and other traditional concepts of chemicals control have proven inadequate to protect human health and the environment. Modern policies must be based on knowledge and precaution – not on chance.

Can we foresee risk?

Contrary to common belief, most chemicals have not been examined for their hazard to humans or the environment.

The standard procedure is to test a substance on fish or mice in a laboratory to get some idea of the hazard of the substance. Then authorities try to estimate the risk associated with a hazardous substance in a risk assessment.

This is done relying on limited, insufficient or even non-existent data regarding the hazard, where the substance is used, in what quantities it may be released, where it ends up, whether it breaks down slowly or rapidly etc.

Risk assessments are documented in papers, often tens of thousands of pages long, involving hundreds of persons, taking years to complete and covering thousands of issues.

The basis in all risk assessments is the belief that risk can be foreseen and controlled. They try to calculate the risk, or probability, that the substance will cause harm. When there is a gap in knowledge, assumptions are made. On such grounds hazardous substances may be registered for production and use all over the world.

Obviously, the knowledge derived through risk assessment is highly

insufficient. In many ways, it's like looking through a keyhole into a skyscraper, trying to draw a map of what the interior looks like.

Time and time again it has been proven that assessing risk is impossible. In infinitely complex systems, such as chemicals, ecosystems and human health, the risk is simply impossible to anticipate. The unknown factors are too many and impossible to foresee. And as everyone knows, the unforeseeable cannot be predicted.

Consequently, risk assessments are as full of holes as a Swiss cheese.

On a regular basis, scientists discover damage to human health or the environment caused by factors that were

never considered in any risk assessment, or because assumptions made in the risk assessments were simply wrong.

There are many cases when substances that have been risk assessed were later connected to disasters. The notorious substances DDT and PCB are only show-cases where risk assessment has proven completely inadequate.

It is remarkable that the obvious deficiencies in risk assessments have been ignored for such a long time, but reality is catching up.

Many scientists and politicians today acknowledge that relying on risk assessment is unsustainable. Additionally, policies must focus on the properties of chemical substances aiming to eliminate the hazard.



Hazard



Imagine that you have been at a circus with your six-year old daughter. She is enthusiastic about the acrobats who walked the tightrope ten metres above ground and she wants to try it herself.

At home she convinces you to find a long wooden board that she can use for her practice.

Would you put the board between two rooftops – high above the ground – or on a pair of bricks only slightly above the grass?

If you assess the probability, or risk, of her stumbling and falling off the board, it would be the same in both cases.

However, its quite obvious that the danger, or hazard, if she falls off the

board and hits the ground is much greater if the board is high above the ground. She is likely to be severely injured if she falls off. By putting the board on the bricks you can eliminate the hazard and your daughter is safe, no matter how high the risk of falling is.

Translated into chemicals policies, this means that if society uses less hazardous substances, the threat is much smaller when risk assessments fail.

Fortunately, a person who walks the tightrope high above the ground is only risking his or her own health. Chemicals policies relying on risk assessments are risking the health of everyone, even of future generations.

Therefore, chemicals policies need to change perspective. The key to a safer

policy is that hazard needs to be the deciding criteria for the evaluation of chemicals. By eliminating substances with hazardous properties, the possibilities of protecting human health and environment will increase dramatically.

Obviously, any substance that is considered to cause cancer, mutation or birth defects must be considered to be hazardous. Likewise, substances suspected of affecting the immune or endocrine systems or giving reason for similar concern.

But additionally, any substance that breaks down slowly or bio-accumulates must be considered hazardous since there is no way of knowing the long-term effects. For example, substances with endocrine effects may accumulate

in human milk and have impact on the next generation. The effects may not develop or become apparent until the child becomes a grown-up.

A substance suspected of having any of the following properties must be defined as hazardous: being persistent or bio-accumulative, carcinogenic, mutagenic, toxic to reproduction, endocrine disrupting or causing effects of similar concern.

Any substance suspected of being hazardous should be phased out. If such a substance is deemed necessary in society, and if there is no less hazardous alternative, it should be produced and used with extreme caution, but only until there is a less hazardous alternative available.

A toxic free environment

Scientists and politicians are increasingly realizing that there is no such thing as a safe level of any hazardous substance. The unknown is not possible to predict.

The use of chemicals that persist in the environment, bioaccumulate, disrupt hormones or contribute to rising rates of cancer, allergies and reproductive damage must be halted.



The goal must be a society and an environment free from such chemicals, a toxic free environment.

Policies must abandon the idea of controlling levels and instead aim for the elimination of substances that pose a risk to human health or the ecosystem. Any chemical must be regarded as a hazardous substance if it breaks down slowly, bioaccumulates or is suspected of having adverse effects on humans or the ecosystem.

A policy aimed at the elimination of hazardous substances must be based on four important principles. One of the most important lessons from the past is the need for precaution. Where there are gaps in the facts, we must use the Precautionary principle, halting the ongoing

use of hazardous substances and preventing the introduction of new ones.

Further, we must use the Substitution principle, always using the least hazardous substance possible and continuously developing safer alternatives.

We must also use the Polluter Pays principle, holding industries and business accountable for the chemicals they produce, use and release.

Finally, we must use the Right to Know principle, allowing market forces to encourage substitution as citizens choose safer alternatives.

Using these tools will enable us to eventually reach the ultimate goal of an environment free from toxic pollution.



A toxic free environment includes the following:

- **The concentrations of substances that naturally occur in the environment are close to the background concentrations.**
- **The levels of man-made substances in the environment are close to zero.**

Better safe than sorry

The Precautionary Principle

Since risk in a complex system cannot be assessed or managed, eliminating the impacts from hazardous substances can only be achieved if the hazardous substances are eliminated.

The guiding principle in this approach is the Precautionary principle. In short, the meaning of the principle may be described as “better safe than sorry”.

In 1992, the United Nations adopted the following definition of the principle: ***where there are threats of serious or irreversible damage to the environment, lack of full scientific certainty should not be used as a reason for postponing cost-effective measures to prevent environmental degradation.***

This definition gives the general direction, although it mainly deals with

Ooops!



criteria for halting destructive practices that are already in place.

There are many cases where precaution has been used to stop production and use of hazardous substances. In many countries, the use of PCB was banned without conclusive scientific evidence showing that the substance was causing harm. Similarly the use of ozone-depleting substances was banned prior to conclusive evidence was at hand.

If the Precautionary principle had not been used, phase-outs of these sub-

stances would have been postponed until there was such evidence and the damage on human health and the environment would have been even worse.

However, these disasters were possible in the first place because politicians relied on risk assessments. Even though it was known that these substances brake down slowly and are hazardous, they were considered safe at low doses – no-one could predict what would later happen.

So even though these substances were phased out in accordance with the Precautionary principle as defined by the UN, damage had already been done. They had been used for a long time and had already caused immense damages to human health and the environment

as well as huge costs for society. Precaution was used too late.

This shows the need to also be pre-emptive, aiming to stop damage before it happens. If authorities had taken pre-emptive precaution and focused on hazard, the disasters would have been prevented.

The main basis for a sustainable chemicals policy must be elimination of hazardous substances through a pre-emptive precautionary approach. Eliminate existing substances suspected of being hazardous and stop new ones before they are introduced on the market.

Substituting the villains

The Substitution Principle

Substitution is a central mechanism in a policy aiming for the elimination of hazardous substances since there are substances that will be problematic to ban. Such are substances deemed necessary in society and substances that cause concern but are not hazardous enough to be the targets of immediate regulatory action.

In this context authorities need to prescribe and promote the development of safer alternatives by applying the Substitution principle.

The general intention of the Substitution principle is that ***a chemical substance must be substituted when a safer alternative is available.***



This is only common sense. After all, we all try to avoid danger when we can. We don't walk into a dark alley with a villain standing in the shadows if there is a brightly lit shopping mall in the same direction. We choose the least hazardous option when given an alternative.

Unfortunately, the logic of commerce is not always in tune with common sense. Replacing a hazardous substance may be costly or seem unnecessary to the people producing or using it. Developing new – less hazardous substances – is also resource demanding, and most companies hesitate to take the risk if they aren't certain that the customers will buy the new product. To encourage this, there needs to be an incentive for change.

Substitution policies have been effective when used. There are many examples where the use of hazardous substances has been reduced or eliminated by replacing them with easily available substitutes.

Some countries apply this principle in their pesticides policies, prescribing that farmers use the least hazardous substance to achieve their goal. In this way many hazardous pesticides have been phased out and replaced by less hazardous. Also many industries have applied this principle, substituting hazardous substances in their production, or even changing the entire process, finding one that allows the use of safer alternatives.

A chemicals policy aimed at eliminating hazardous substances needs a mechanism to ensure that such substances are substituted as soon as possible.

The polluter pays

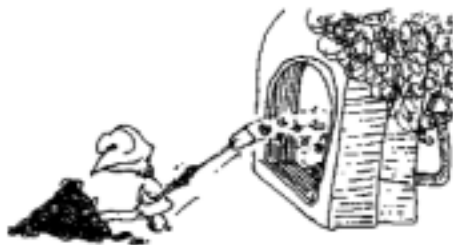
The Polluter Pays Principle

Another important part of a chemicals policy aiming at the elimination of hazardous substances is the Polluter Pays principle. The bottom line of this is that ***the company or persons who cause an environmental damage should pay for the consequences.***

This creates an incentive to substitute hazardous substances and to use the safest chemicals possible.

This principle may seem natural and most people believe this is practice everywhere. But when it comes to damages to the environment, the practice is often the opposite. The polluters get away with it and society takes the beating.

The reason this principle has not been applied concerning chemicals is that



legislation has focused on trying to connect a certain substance in a certain place to a certain company or person. This is almost impossible since chemicals are so widely spread throughout the environment, society and our bodies. As a rule it is difficult to tell where they came from since they are used in so many places.

Even when the source has been identified the polluters are considered unliable since the authorities had permitted the production and release.

So we all pay the costs for inadequate policies: the ubiquitous presence of PCB in the environment and our food, the pesticides in ground water and food around the world, the brominated flame retardants and plasticizers found in mother`s milk everywhere.

Aside from the effects on human health and the environment, the economic consequences of these releases are astronomical.

This practice is contradictory to practice in most other areas. Smokers have sued tobacco-companies, forcing them to pay for health damages even though it is permitted to sell tobacco. Similarly, pharmaceutical companies are liable for the damages caused by their medicines – which have also been approved by authorities.

It is well known that economy is one of the most important incentives for industry. Thus implementing the Polluter Pays principle does not only shift the liability to those who create the problems, it will also have a dramatic effect on the production and use of hazardous substances, as well as on the development of safer alternatives.

A chemicals policy aiming to eliminate hazardous substances needs to use the Polluter Pays principle as an incentive to develop and use the least hazardous substances available. Producers of chemicals should be made liable for the damage they cause.

The right to know



The production and use of hazardous substances is vast. They are used in production processes and household products in enormous quantities everywhere. From there they are released to the environment and find their way into our food, water and air, affecting the ecosystem and eventually ending up in our bodies.

Still, very few persons have access to basic information and data about the production and use of these substances. Most citizens have no idea where hazardous substances are used or what hazard they represent, thus having no way of judging what they are exposing themselves to or how to avoid it.

In a modern society this would be unacceptable in other sectors. But again – chemicals policy is different. Companies producing or using chemical substances want to keep them secret, allegedly for reasons of competition, and authorities have agreed. Industry is not required to disclose information about the substances that they are exposing us for.

Often producers also have other reasons to keep their secrets out of the public eye. The general public is kept ignorant. If the chemical content of many products were known to the general public, it is likely that they would choose other products, or that there would be demands for change.

Therefore, the Right to Know principle is a very useful tool in a chemicals policy. It intends to ***make government or corporate data and records available to the public or to those individuals with a particular interest in the information.***

Aside from common sense and democratic principles, this is important also for the development of a chemicals policy aiming at the elimination of hazardous substances. Experience shows

that citizens care about their health and the environment, and if they have access to information, they choose safer products.

This behaviour could be a very strong incentive for the companies using chemicals to choose safer alternatives when they produce their products. It is also essential for the development of safer alternatives to substitute hazardous substances.

Citizens must be given the right to know the facts about the products available in society so they can make an informed choice. Information about the content or use of hazardous substances needs to be readily accessible on products and through databases.

The International Chemical Secretariat

The International Chemical Secretariat is a non-profit organisation dedicated to work towards a toxic free environment. In order to achieve this, the Secretariat promotes the implementation of precautionary perspectives into international chemicals policies and practices.

More specifically, we keep ourselves informed about the latest and most progressive research and initiatives in the area of chemicals. We distribute this information to other stakeholders, primarily politicians and civil servants, industry and environmental NGOs, aiming to build capacity and strengthen protection of human health and the environment in chemicals regulation around the world.



We have continuous dialogues with the stakeholders through meetings, seminars, workshops, newsletters, networks and IT. We also work to create networks and to be a resource for NGOs in this field.

Since the globally most progressive chemicals policies are currently developing in the European Union, this is the primary area of our attention presently. We work to strengthen the precautionary approach in the new EU regulation, called REACH, and counteract attempts to weaken the proposed regulation.

However, we also work to transfer knowledge about chemicals and the development within this field to other regions of the world. Thus, we see capacity building and networking in other places of the world as an important part of our role in the near future.

The Secretariat was founded in 2002 by four environmental organisations: the Swedish Society for Nature

Conservation, WWF Sweden, Fältbiologerna, and Friends of the Earth Sweden. The Secretariat is funded by grants from foundations and authorities.

In short, the International Chemical Secretariat:

- **Serves as a resource and support for civil society, industry and NGOs on issues relating to chemicals.**
- **Seeks to collaborate with allies. One important initiative is to encourage progressive forces in business to take part in the public debate.**
- **Monitors and informs about political development, industrial initiatives, new research results, etc.**

In order to reduce the risks posed by chemicals, we need to look beyond risk management, safety levels and acceptable intake of toxic substances. Instead, the aim must be to achieve a toxic free environment by eliminating the use of chemicals with hazardous properties.

This booklet gives a basic introduction to these concepts and to the principles that need to be included in a chemicals policy that truly can give us a healthy environment.



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