

# Cheminova A/S - Green Accounts 2008

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## Introductory particulars

<b>Name</b>	Cheminova A/S
<b>Location</b>	Thyborønvej 78 DK-7673 Harboøre Denmark
<b>Company mission</b>	We help improve quality of life for the world's population by supplying products that help farmers increase yields and quality of crops to satisfy the global demand for food, feed, fiber and energy.
<b>Telephone/Fax</b>	96 90 96 90/96 90 96 91
<b>Website</b>	<a href="http://www.cheminova.com">www.cheminova.com</a>
<b>Environmental supervision authority</b>	The Environmental Centre Aarhus under the Danish Ministry of Environment.
<b>Industrial sector</b>	Chemical industry.
<b>Primary activity</b>	Manufacture of basic plant protection products.
<b>Significant secondary activities</b>	Natural gas-fired CHP unit. Storage facilities for raw and finished products, waste-water treatment plant, laboratories for R&D and quality control, workshops and filling facilities.
<b>Point in the list in Annex to Statutory Order from the Ministry of Environment and Energy No. 975 of December 13, 1995</b>	D106. Enterprises engaged in the production of basic plant protection products or biocides.
<b>Holding company</b>	Auriga Industries A/S, P.O. Box 9, 7620 Lemvig, Denmark.
<b>CVR no.</b>	12760043

<b>P no.</b>	1.000.441.076
<b>Most significant environmental approvals</b>	<p>24.03.88 Total approval of production plants</p> <p>24.06.93 Glyphosate (herbicide)</p> <p>03.07.01 Pyrethroid part 1 (insecticide)</p> <p>05.02.03 Revision of basic production terms</p> <p>10.10.03 Pyrethroid part 2</p> <p>16.11.04 Diflufenican (herbicide)</p> <p>28.09.05 Fenoxaprop-P-ethyl (herbicide)</p> <p>01.07.05 Revised ruling concerning waste water</p> <p>14.11.05 Cloquintocet (herbicide)</p> <p>19.05.06 Revised ruling concerning the risk area</p> <p>15.12.06 Total electronic approval</p>
<b>Recipient</b>	The North Sea. The company is not connected to a public waste-water treatment plant as it has its own biological plant to treat the waste water.
<b>Qualitative indication of resource and environmental parameters</b>	<p>The company's most significant resource parameters concern the consumption of raw materials in the form of organic and inorganic chemicals, energy and water. Most of the resources are consumed in connection with the manufacture of plant protection products and intermediates thereof.</p> <p>The most significant environmental parameters concern the emission of solvents, CO<sub>2</sub>, SO<sub>2</sub>, NO<sub>x</sub> and "odour" to the air and the discharge of nitrogen, phosphorus and combined organic carbon in waste water. Furthermore, waste is generated both in the form of hazardous waste and in the form of sludge from the company's biological treatment plant. Both types of waste are sent to approved waste-treatment facilities.</p> <p>The company's primary products, pesticides, are designed to have a biological effect on either insects (insecticides), plants (herbicides) or fungi (fungicides). The correct application of the substances is, of course, of material importance to preventing undesired environmental impacts. The products are therefore, in all the countries in which they are marketed, subject to statutory registration to ensure their correct application. The statutory limitations on their application are indicated on the product labels together with instructions for use.</p> <p>In connection with the production of pesticides, it is important that biologically active ingredients are not inadvertently spread to the surroundings. This is ensured through a combination of technical safety measures and a set of written procedures and instructions which employees must adhere to.</p>

## Statement by the management

### Information significant to understanding the environmental impacts of the company's activities

Against the background of an environmental-technical mapping, the most significant environmental impacts have been selected on the basis of the following criteria:

#### Resources:

The company's consumption of raw materials and auxiliary materials comprises a number of chemicals, some with potential environmental impacts. The consumption of raw materials and auxiliary materials has therefore been categorised according to the classification of the substances.

Energy has been included as it is a limited resource.

Water has been included as this resource is subject to attention by society.

#### Emissions to the air:

SO<sub>2</sub>, NO<sub>x</sub> and CO<sub>2</sub> are included on account of the attention generally given thereto by society. Furthermore, some specific chemicals are included according to demand from the Danish Environmental Protection Agency. Finally, odour is mentioned as being of local importance.

#### Discharges to water:

The company has its own biological waste-water treatment plant with micro-organisms which are particularly suited to break down the specific chemical compounds present in the waste water.

Phosphorus, nitrogen and organic substances are included on account of the attention generally given thereto by society. Furthermore, the discharge of cooling water is mentioned as being of local importance.

#### Waste:

Commercial waste, hazardous waste and sludge from the company's biological waste-water treatment plant are mentioned. The responsible handling of these types of waste is of material environmental importance.

**The company's  
environmental policy**

Spillage and waste:

In step with marked reductions in the overall environmental impacts of the company's activities on the air and water, "spillage and waste" which have an impact on the local environment for a short period have become the subject of increasing attention by society. Information about such events has therefore been included.

The environment, health and safety are important areas for Cheminova, and all the activities of the company are undertaken with due consideration being given to the fact that the company is endeavouring to continuously improve results within these areas.

Thus, the company is endeavouring to undertake all activities with due consideration being given to humans and the environment and to communicate openly, both internally and externally, about matters concerning the environment, health and safety.

This is achieved through:

- The company's compliance with all legislation, rules and regulations in force from time to time, including statutory requirements.
- The ongoing assessment of impacts and setting of targets for a reduction in emissions or the consumption of resources, including energy, with account being taken of the best available technology.
- The setting of targets within the areas of occupational health and safety.
- The maintenance of emergency services to reduce the consequences of any accidents.
- The choice of processes, raw materials and auxiliary materials in connection with the development of new products and the further development of existing products, taking account of their possible impacts on humans and the environment.
- Ensuring sufficient communication internally and in relation to the authorities.
- The maintenance of an open dialogue with cooperation partners and the public concerning the company's policies, targets and results.
- Ensuring that employees are able to meet the requirements made in respect of their work and that they are aware of their own impact on the environment and safety.

Cheminova has joined the Responsible Care programme, an agreement which lays down requirements concerning the company's work on, for example, its environmental policy and documentation.

## **Significant environmental aspects and targets**

### **Legislation**

Since 1988, Cheminova has had an overall environmental approval of its activities in Denmark. Since then, just under 200 supplementary approvals have been granted. The general environmental approval, which is very extensive, has in the period 2003 to 2006 been revised. The review has been divided into four main areas: General basic terms for the whole company, specific terms for the individual production plants, the discharge of waste water and gaseous emissions to the atmosphere. An essential part of the revision is a renewed waste-water approval based on EU's directive of October 23, 2000 concerning determination of conditions for the union's water political measurements the Water Framework Directive. The actual emission requirements have been settled according to the new EU direction "Technical risk assessment TGD 2003".

EU's Water Framework Directive has to be implemented in the member states before 2015. In this way, the new waste-water approval is an important securing of the future production.

The company is subject to the EU Directive 96/82/EC on the control of major-accident hazards involving dangerous substances. Revised registration in pursuance to this legislation should have been implemented by the end of 2004, but due to changed classifications of some of the company's products the work has become more comprehensive than expected. A full updated registration was sent to the authorities in December 2005. An official approval of the risk registration was available in May 2006.

### **Certified management systems**

Cheminova has an energy management system certified in accordance with DS 2403. Certification is required in order to be able to enter into an agreement concerning energy effectivisation with the Danish Energy Authority.

In 2004, Cheminova has been adapting an existing environmental and health and safety management system to comply with ISO 14001 and OHSAS 18001. In 2006, the new system has been audited, and the certificates were received on February 15, 2007.

Status concerning objectives, targets and plans of action according to the certified management system for 2008 appears from enclosure 1.

## **Energy**

For a number of years, Cheminova has had an agreement with the Danish Energy Agency according to the Danish law about a government subsidy to some companies with a heavy consumption of energy. The benefit in this type of agreements is a reduced tax on the emission of CO<sub>2</sub>. The existing agreement expired in July 2006. A declaration of intent concerning a new agreement has been filed. A new agreement for a 3 year period was signed on April 24, 2007.

In addition to the general demands on such agreements, the agreement includes an actual energy saving project in the shape of exploitation of waste hydrogen from a production plant to heating purposes. Further energy savings will be implemented on this plant in the coming years. The agreement is based on the following energy policy:

“Through its energy policy, transparency of its energy consumption, follow-up and assessment of results, Cheminova wishes to ensure continuous improvements to and the financially optimum utilisation of energy resources.”

Cheminova’s energy policy applies to all activities taking place at the factory on Rønland.

All the areas of the company which make use of energy-intensive processes (heavy energy) as well as other areas with considerable energy consumption are subject to an audited energy management system.

Against this background, the company endeavours to ensure:

- That the energy consumption in daily operations is assessed in the same way as optimum raw material utilisation and the environmentally sound and reliable operation of the process plants;
- That the energy consumption is made transparent through the measuring and calculation of energy key figures for relevant energy flows;
- That the energy consumption in connection with new plants and the expansion of plants is assessed in the same way as operating reliability and raw material utilisation;
- That employees are made energy-conscious through dialogue and supplementary training;

- That the company's energy consumption and energy policy are published in its green accounts.

Energy objectives and targets:

It is the objective of Cheminova, via its energy management system, to minimise the energy consumed per unit manufactured.

Energy-savings projects with a payback period of less than 4 years will be implemented.

Obtained saving:

The consumption of electricity and steam at the whole factory has in 2008 been increased by 3% compared to 2007. The increase is due to an increased level of activity. The energy consumption per produced tonne of product has been reduced from 2.85 MWh in 2007 to 2.58 MWh in 2008.

## **Waste**

Until mid-2002, a phosphorous by-product which is produced on the basis of sludge from the company's biological waste-water treatment plant was sold to the Danish agricultural sector for fertilisation purposes under the name "Cheminova Fosfat". However, the agricultural sector now has a very considerable own production of phosphorous manure, compared to the consumption permitted. Furthermore, the authorities in many counties in Denmark have been very unwilling to issue the necessary spreading permits. Consequently, Cheminova has sought alternative uses abroad, but it has not been possible to obtain the necessary permits for the exportation of Cheminova Fosfat. This has meant that the possibilities for selling Cheminova Fosfat are now so limited that alternative handling methods are required. Since mid-2002, the product has been sent to a special-purpose depot in Norway.

## **Spillage and waste**

"Spillage and waste" is defined as operating disturbances which have an impact on the external environment for a short period of time as a result of human or technical errors. The impacts of such events will typically be of marginal importance, but may give rise to local inconveniences (odour, a visible cloud, etc.). It is the aim of the company to reduce the number of such events.

Spillage and waste has been registered systematically since the middle of 2001. The number of events increased in 2005 compared to the uniform levels in 2003 and 2004. In 2006, a number of initiatives have been initiated in order to reduce

the number in the coming years. These efforts have been fruitful, and in 2006, the number has been reduced by 25%, in 2007 by 43% and in 2008 by further 19%. Cf. the section “Information about environmental conditions, spillage and waste”.

## **Transport**

Goods are transported to and from the company by road, rail and sea. In recent years, road transports have largely been replaced by rail and sea transport. Thus, 40 per cent of goods are now transported by rail or sea.

Transport by sea and rail is financially attractive for the transportation of large volumes. Furthermore, this benefits the environment in the form of reduced energy consumption per tonne transported.

## **Environmental requirements in relation to sub-suppliers**

In 2006, a supplier code has been formulated. Among other things the code includes environmental conditions. This has been further described in the company’s first CSR report that was prepared for 2006 and which is available on the company’s website. State of affairs concerning supplier management will appear from the CSR report for 2008 which is also available on the company’s website.

## **Involvement of employees**

All groups of employees are involved in the company’s environmental activities. Project groups are formed in connection with the construction of new plants and major expansions. Compliance with environmental rules and regulations is a natural part of the daily work routines of the company’s operating staff. This will be strengthened in connection with the current introduction of the environmental management system according to ISO 14001 and OHSAS 18001.

## **Occupational risks**

The company handles a wide range of chemical substances, including some which may give rise to occupational impacts if they are not handled correctly. The company possesses long-standing experience with the responsible handling of such products. Furthermore, the company has its own occupational health service which performs inspections and offers advice and guidance to the rest of the organisation about these matters.

In 2008, the company reported 22 accidents to The Danish Working Environment Service. The absenteeism due to accidents amounted to 3.5 hours per 1,000 hours worked. The absenteeism is relatively high and is primarily due to injuries to the motor apparatus such as the back, arms and legs.

It is very important to observe risky conditions before they

develop and it is gratifying to state that the number of reports concerning “nearby accidents” is continuously increasing. In 2008, 198 “nearby accents” were reported.

The company follows the quality of the health and safety at work with different measurements of the working environment. A separate statement concerning occupational health and safety has been prepared.

**Instances of non-compliance**

In 2008, there have been 6 instances of non-compliance compared to 7 in 2007. Two of these instances are involved in the same matter. The instances are:

- Condition Waste water 7.5 concerning non-compliance of the requirements of discharge as regards individual products.
- Condition Waste water 8.2 concerning non-compliance of the requirements of discharge as regards finished products.
- Condition Air 2.4 concerning shutdown of plant during shutdown time.
- Condition Air 8.1 concerning non-compliance of fixed limits and norms as regards emission.
- Conditions Basic 2.1 concerning handling of chemicals.
- Conditions Basic 2.5 concerning control by bottling and draining of chemicals.

Cheminova has received an enjoining from the environmental authorities that the conditions given in the environmental approval must be complied with. The enjoining has been taken note of and as mentioned in the section “Information about environmental issues” there is increased attention to compliance of requirements.

**Deviations**

Any deviations in relation to previous versions of the company’s green accounts are stated in the individual sections.

**Complaints**

In 2008, there have been no complaints from neighbours or others concerning the environmental conditions of the company.

## Information about environmental issues

### **Consumption of energy, water, raw materials and significant types and volumes of polluting substances**

The information is given in “Key figures for the environmental performance of Cheminova in 2008” for input and output in Annexes 2 and 3, respectively.

### **Energy**

In 2008, the consumption of energy has been higher than the previous year. This is primarily due to an increased level of activity in the production. However, savings of energy are still in focus.

### **Raw materials, auxiliary materials and products sold**

Cheminova has decided to categorise raw materials, auxiliary materials and products sold according to their classification. Where data are harmful to the environment, hazardous/toxic, corrosive/causing local irritation or inflammable, they have been included under the category harmful to the environment. Where data are hazardous/toxic, corrosive/causing local irritation or inflammable, they have been included under the category hazardous/toxic. Where data are corrosive/causing local irritation or inflammable, they have been included under the category corrosive/causing local irritation.

The variations between the different categories in the five years period ascribe to random fluctuations in production according to the demand for the different products.

### **Substitution**

The company is aware of the possibilities of substituting substances included in the “List of undesired substances” with other substances. In connection with the development of new processes, focus is on this issue. If a less dangerous substance can replace a more dangerous one, and the less dangerous substance has the same properties and is competitive as regards its quality and price, the least dangerous substance will be used.

### **Waste**

The large volume of waste deposited is mainly attributable to the deposition of sludge from the purification plant. For a period of more than ten years, the sludge was dried and reused as phosphorous fertiliser by farmers in Denmark. This problematic has been discussed in Statement by the management. As sludge accounts for by far the largest individual flow, this practice has a material impact on the company’s overall waste hierarchy.

The larger volume of waste in 2008 is primarily due to the increased activity in the production department.

The volume of hazardous waste has increased markedly

compared to 2007. This is especially due to increased activities in the production department. Further, it has resulted in an increased quantity of evaporated waste water from the production being sent to an external receiver of waste. The majority of this waste flow is, however, still treated by the company's own incineration plant.

Likewise, the start-up of new productions has also contributed to an enlarged flow of waste sent to an external receiver of waste.

### **Emissions to water**

It is necessary to add nutrients in the form of nitrogen to the micro-organisms in the waste-water treatment plant. A certain level of nitrogen is therefore "the price" for the break down of the chemical substances in the waste water. A reduction of the nitrogen level will easily result in a lower efficiency of the waste-water treatment plant resulting in insufficient treatment and risk of instances of non-compliance.

The cooling water consists of two separate systems: Internal and external. The internal cooling water is circulated in a closed system, which indirectly cools current production processes. This cooling water flow is then indirectly cooled by the external cooling water (bay water), which is drawn from Nissum Bredning and pumped back into the bay.

Generally, the self-policing of the waste water shows that demands have been complied with. The demand values for individual products have, however, been exceeded. In order to meet this problem, internal demands of quality have been changed.

The emissions of halogenated organic compounds and phenols have increased in 2008. This is due to start-up of new production activities.

### **Emission to air**

Emissions of SO<sub>2</sub> have again fallen drastically compared to 2007. This is due to the fact that the full effect of a new plant for reduction of the SO<sub>2</sub> emission has been seen in 2008.

The increase of the total NO<sub>x</sub> emission is partly due to a larger fuel consumption because of increased production activities. Further, a new key figure has been used in the calculation and has contributed to the increased volume.

Emissions from the hydrogen boiler has not been included in the NO<sub>x</sub> emission as that emission has not yet been determined. The full effect from the hydrogen boiler is expected to be stated in 2009.

There is a small increase in the CO<sub>2</sub> emission which is due to increased production activities.

The company's central air cleaning plant has run well in 2008 with stable running and a minimum of omissions. An increase is seen in the halogenated organic compounds which is due to the increased production activities.

In 2008, the waste-water incineration plant has been running stable and safely. The emissions of chlorine, inorganic compounds and dust have fallen. There has been a slight increase of halogenated organic compounds which may be due to an increased activity at the belonging production plant.

**Emission of substances included in EPA's annex A in the guidance on green accounts**

Emissions of specific substances stated according to demands from the EPA are calculated according to the same principles since 2003. The new principle for calculation includes more specific substances than earlier. This applies for emissions to both air and water.

**Dust**

Dust emissions from one waste-water incineration furnace are being monitored continuously. The demand has been complied with.

**Noise**

The company's noise levels are well below the statutory requirements applicable at boundaries and in open countryside with 4 kilometres to the nearest neighbour, the company causes no inconvenience due to noise.

**Odour**

Air extracted from production and tank plants is incinerated in an air-incineration plant, causing the destruction of all odour substances. Air, which is not deemed to involve any health hazards, e.g. from room ventilation, is discharged directly into the open. Diffuse sources occasionally cause odours to be emitted from the company.

**Spillage and waste**

Events with spillage and waste are registered and divided into three categories. Categories 1 and 2 describe events, which have caused some environmental impact, while category 3 comprises events, which have had no environmental impact. "Key figures for the environmental performance of Cheminova in 2008" include events in categories 1 and 2. Most events are caused by technical errors.

The number of events has fallen in 2008 compared to 2007.

There has been one event in category 1 whereto events causing essential environmental impact are assigned. The event in question was dropping-out of a plant from the air

incineration plant where there is a demand for stopping the plant during down time. The plant was not shut down as prescribed in the environmental conditions for the plant.

The other reported events can be placed in category 2 comprising events causing pollution on the level of inconvenience.


### **Emissions to the soil**

In 2008, there have been 3 events of spillage and waste to unfortified areas. The number of these spillages and wastes has therefore fallen since 2007 where 9 events were reported. The background for this is increased attention to precisely this type of events.

## Summary of self-policing

This section contains conclusions concerning Cheminova's own measurements in 2008 on significant emissions. For each site, a conclusion and a table with measurement results and requirements have been prepared

### Summary of own measurements of emissions to the air in 2008

<p>Process emissions from production plants are cleaned in the central air-incineration plant.</p>	<table border="1"> <thead> <tr> <th>Parameter</th> <th>Unit</th> <th>Requirement</th> <th>Results</th> <th>No. of measurements</th> <th>Instances of non-compliance</th> </tr> </thead> <tbody> <tr> <td>Odour</td> <td>OU/s</td> <td>450,000</td> <td>162,000</td> <td>12</td> <td></td> </tr> <tr> <td>Out time</td> <td>%</td> <td>2.5</td> <td>2.4</td> <td></td> <td></td> </tr> <tr> <td>Main group I class 1*</td> <td>mg/Nm<sup>3</sup></td> <td>0.25</td> <td>&lt; 0.01</td> <td>2</td> <td></td> </tr> <tr> <td>Main group I class 2</td> <td>mg/Nm<sup>3</sup></td> <td>2.5</td> <td>0-0.07</td> <td>2</td> <td></td> </tr> <tr> <td>Main group II class 1</td> <td>mg/Nm<sup>3</sup></td> <td>5</td> <td>0.6</td> <td>2</td> <td></td> </tr> <tr> <td>Main group II class 2</td> <td>mg/Nm<sup>3</sup></td> <td>100</td> <td>4</td> <td>2</td> <td></td> </tr> <tr> <td>Main group II class 3</td> <td>mg/Nm<sup>3</sup></td> <td>300</td> <td>8</td> <td>2</td> <td></td> </tr> <tr> <td>Main group II, sum class 1+2+3</td> <td>mg/Nm<sup>3</sup></td> <td>300</td> <td>12</td> <td>2</td> <td></td> </tr> <tr> <td>Hydrogen bromide</td> <td>mg/Nm<sup>3</sup></td> <td>5</td> <td>0.8</td> <td>2</td> <td></td> </tr> <tr> <td>Hydrogen chloride</td> <td>mg/Nm<sup>3</sup></td> <td>100</td> <td>5</td> <td>2</td> <td></td> </tr> <tr> <td>Hydrogen sulphide</td> <td>mg/Nm<sup>3</sup></td> <td>5</td> <td>0.</td> <td>2</td> <td></td> </tr> <tr> <td>TOC</td> <td>mg/Nm<sup>3</sup></td> <td>Not fixed</td> <td>18</td> <td>AMS**</td> <td></td> </tr> <tr> <td>Sulphur dioxide</td> <td>mg/Nm<sup>3</sup></td> <td>400</td> <td>23</td> <td>2</td> <td></td> </tr> </tbody> </table>						Parameter	Unit	Requirement	Results	No. of measurements	Instances of non-compliance	Odour	OU/s	450,000	162,000	12		Out time	%	2.5	2.4			Main group I class 1*	mg/Nm <sup>3</sup>	0.25	< 0.01	2		Main group I class 2	mg/Nm <sup>3</sup>	2.5	0-0.07	2		Main group II class 1	mg/Nm <sup>3</sup>	5	0.6	2		Main group II class 2	mg/Nm <sup>3</sup>	100	4	2		Main group II class 3	mg/Nm <sup>3</sup>	300	8	2		Main group II, sum class 1+2+3	mg/Nm <sup>3</sup>	300	12	2		Hydrogen bromide	mg/Nm <sup>3</sup>	5	0.8	2		Hydrogen chloride	mg/Nm <sup>3</sup>	100	5	2		Hydrogen sulphide	mg/Nm <sup>3</sup>	5	0.	2		TOC	mg/Nm <sup>3</sup>	Not fixed	18	AMS**		Sulphur dioxide	mg/Nm <sup>3</sup>	400	23	2	
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 <p>Measurements in 2008 show that requirements were complied with.</p>	<p>* Organic substances are divided into main groups and classes according to their B value (max. permissible contribution). Main group I class 1 has the lowest B value.            ** AMS: Automatically measuring system that measures continuously.</p>																																																																																									

<p>Separate process emissions from the production of phosphorous insecticides (P-1 scrubber).</p> <p>The measurements in 2008 show that the requirements were complied with.</p>	<table border="1"> <thead> <tr> <th>Parameter</th> <th>Unit</th> <th>Requirement</th> <th>Results</th> <th>No. of measurements</th> <th>Instances of non-compliance</th> </tr> </thead> <tbody> <tr> <td>Hydrogen sulphide</td> <td>mg/Nm<sup>3</sup></td> <td>5</td> <td>1</td> <td>1</td> <td></td> </tr> <tr> <td>Carbon sulphide</td> <td>mg/Nm<sup>3</sup></td> <td>100</td> <td>15</td> <td>1</td> <td></td> </tr> </tbody> </table>						Parameter	Unit	Requirement	Results	No. of measurements	Instances of non-compliance	Hydrogen sulphide	mg/Nm <sup>3</sup>	5	1	1		Carbon sulphide	mg/Nm <sup>3</sup>	100	15	1	
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	Hydrogen sulphide	mg/Nm <sup>3</sup>	5	1	1																			
Carbon sulphide	mg/Nm <sup>3</sup>	100	15	1																				

Waste water from glyphosate is incinerated in the waste-water incineration plant.



Measurements in 2008 show that there has been a few instances of non-compliance as the emission requirements of TOC, dust and CO have been exceeded. The reason has been a defect in the used filters which have now been changed.

Parameter	Unit	Requirement	Results	No. of measurements	Instances of non-compliance
Hydrogen chloride	mg/Nm <sup>3</sup>	10	4	6	
Metals	mg/Nm <sup>3</sup>	0.5 - 5	0.2	2	
TOC	mg/Nm <sup>3</sup>	10	6	6	Yes
Dust	mg/Nm <sup>3</sup>	10	6	2/AMS*	Yes
NO <sub>x</sub>	mg/Nm <sup>3</sup>	400	No avg. per day >400 mg/Nm <sup>3</sup>	AMS	
CO	mg/Nm <sup>3</sup>	50	In 1 day the average is >50 mg/Nm <sup>3</sup>	AMS	Yes

\* Measured partly continuously and partly by 2 work measurements.

At the Claus plant, sulphur from the process air from the P-1 plant is recovered.



Measurements in 2008 show that requirements were complied with.


Parameter	Unit	Requirement	Results	No. of measurements	Instances of non-compliance
SO <sub>2</sub>	kg/h	78	0.08	2	
H <sub>2</sub> S	mg/Nm <sup>3</sup>	5	<0.3	2	

Air emissions from the biological purification plant.



Measurements in 2008 show that requirements were complied with.

Parameter	Unit	Requirement	Results	No. of measurements	Instances of non-compliance
Odour	OU/s	500,000	46,500	6	
Main gr. I class 2	mg/Nm <sup>3</sup>	2.5	0.3	6	
Main gr. II class 1	mg/Nm <sup>3</sup>	5	1.6	6	

Emissions from the CHP plant.	<table border="1"> <thead> <tr> <th>Parameter</th> <th>Unit</th> <th>Requirement</th> <th>Results (measuring intervals)</th> <th>No. of measurements</th> <th>Instances of non-compliance</th> </tr> </thead> <tbody> <tr> <td>NO<sub>x</sub>*</td> <td>mg/Nm<sup>3</sup></td> <td>200</td> <td>98</td> <td>1</td> <td></td> </tr> <tr> <td>CO</td> <td>mg/Nm<sup>3</sup></td> <td>150</td> <td>6</td> <td>1</td> <td></td> </tr> </tbody> </table>					Parameter	Unit	Requirement	Results (measuring intervals)	No. of measurements	Instances of non-compliance	NO <sub>x</sub> *	mg/Nm <sup>3</sup>	200	98	1		CO	mg/Nm <sup>3</sup>	150	6	1	
Parameter	Unit	Requirement	Results (measuring intervals)	No. of measurements	Instances of non-compliance																		
NO <sub>x</sub> *	mg/Nm <sup>3</sup>	200	98	1																			
CO	mg/Nm <sup>3</sup>	150	6	1																			
	<p>* The three turbines are equipped with low-NO<sub>x</sub> turbines.</p>																						
Measurements in 2008 show that CO and NO <sub>x</sub> requirements were complied with.																							

### Summary of own measurements of cooling water discharges in 2008

<p>The cooling water consists of two separate systems: Internal and external. The internal cooling water is circulated in a closed system, which indirectly cools current production processes. This cooling water flow is then indirectly cooled by the external cooling water (bay water), which is drawn from Nissum Bredning and pumped back into the bay.</p>	<p><b>Requirements:</b></p> <ul style="list-style-type: none"> <li>No substances injurious to the environment must be added to external cooling water.</li> <li>The cooling water temperature must, as an annual average, not be raised by more than 9°C and never by more than 15°C.</li> </ul> <p><b>Results in 2008:</b></p> <ul style="list-style-type: none"> <li>Ammonia was found in the external cooling water in 3 cases. All 3 cases were in March, and the volumes varied between 0.02 and 0.07 mg/l. The reason for the content of ammonia is not known and it has not been seen since then.</li> <li>The average temperature increase was 5.8°C. The max. temperature increase measured was 7.7°C. A total of 12 measurements were carried out.</li> </ul>
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## Summary of own measurements of waste-water discharges in 2008

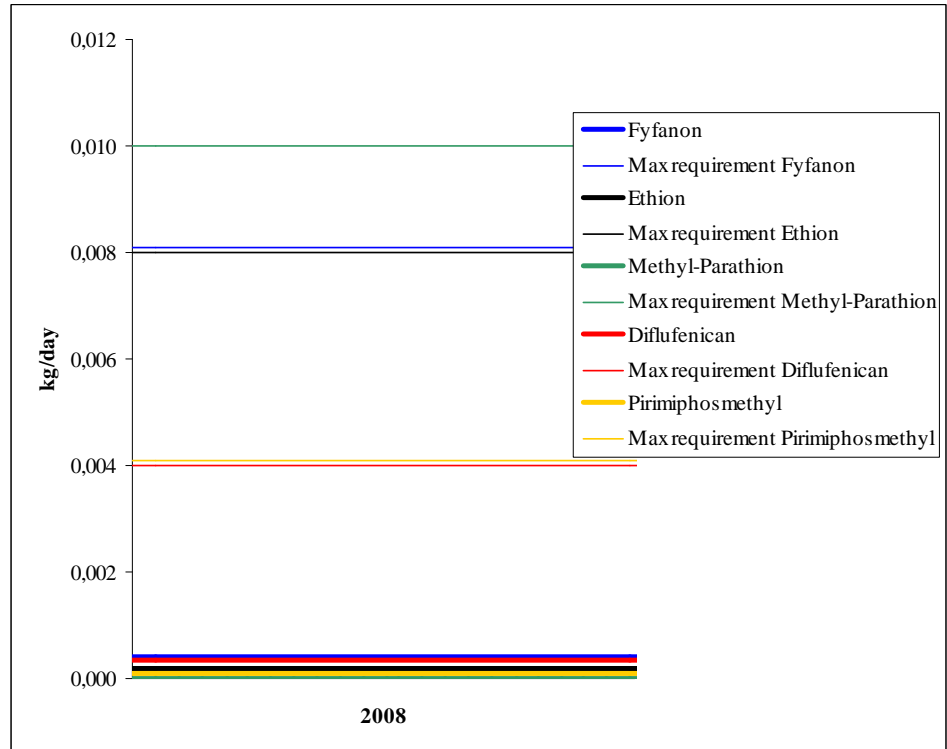
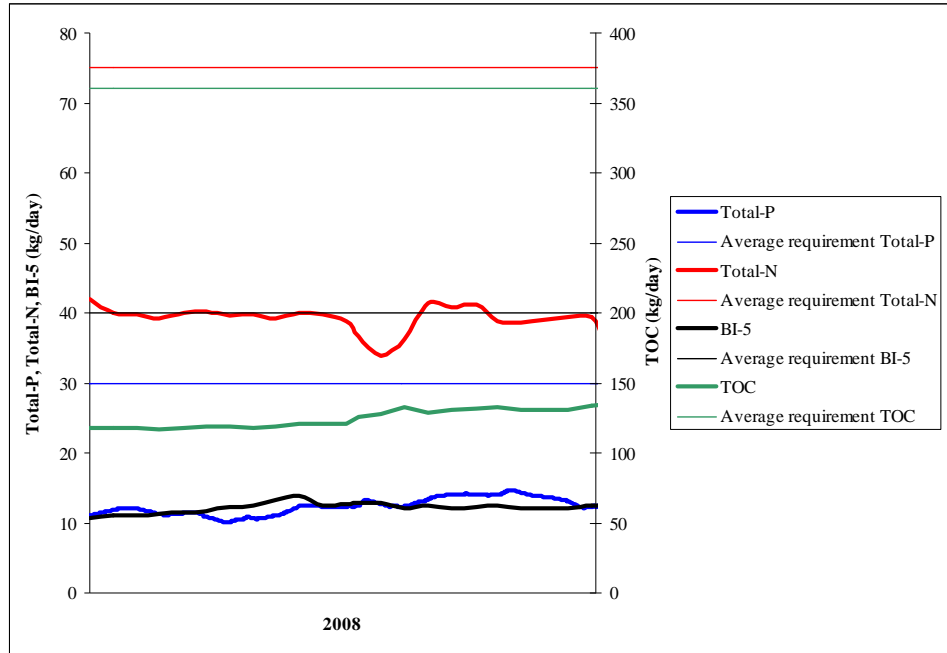
The waste water is purified in the biological treatment plant. Here, organic phosphorous compounds are converted into inorganic phosphorus by means of micro-organisms. Following sedimentation, the purified water is pumped into the North Sea. The sludge is deposited.

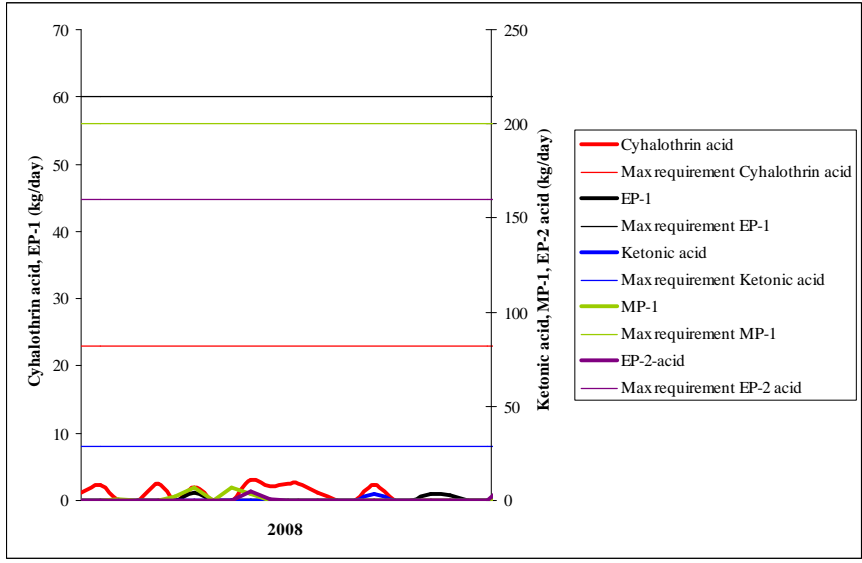
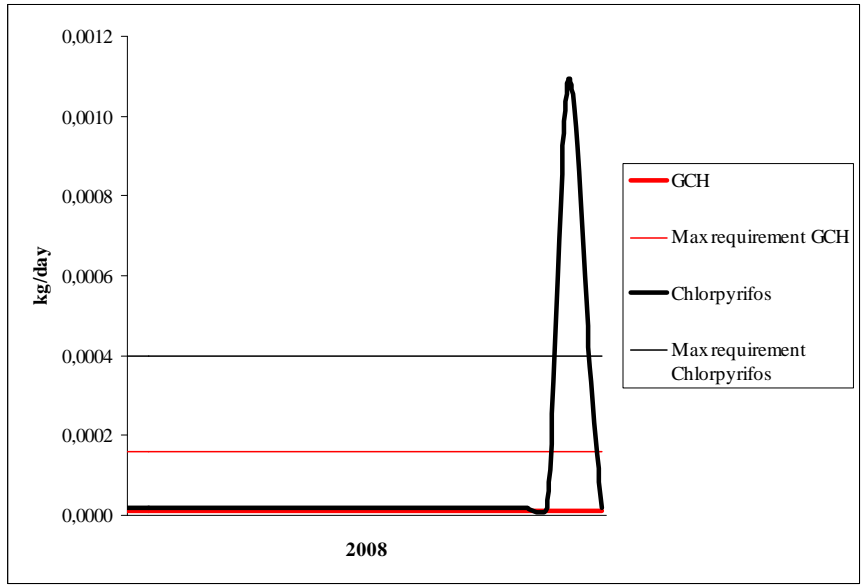
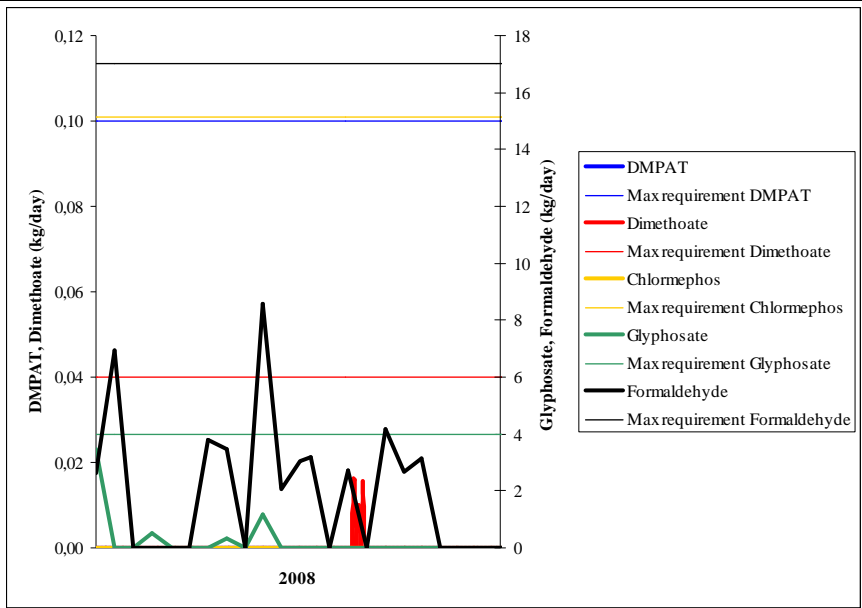


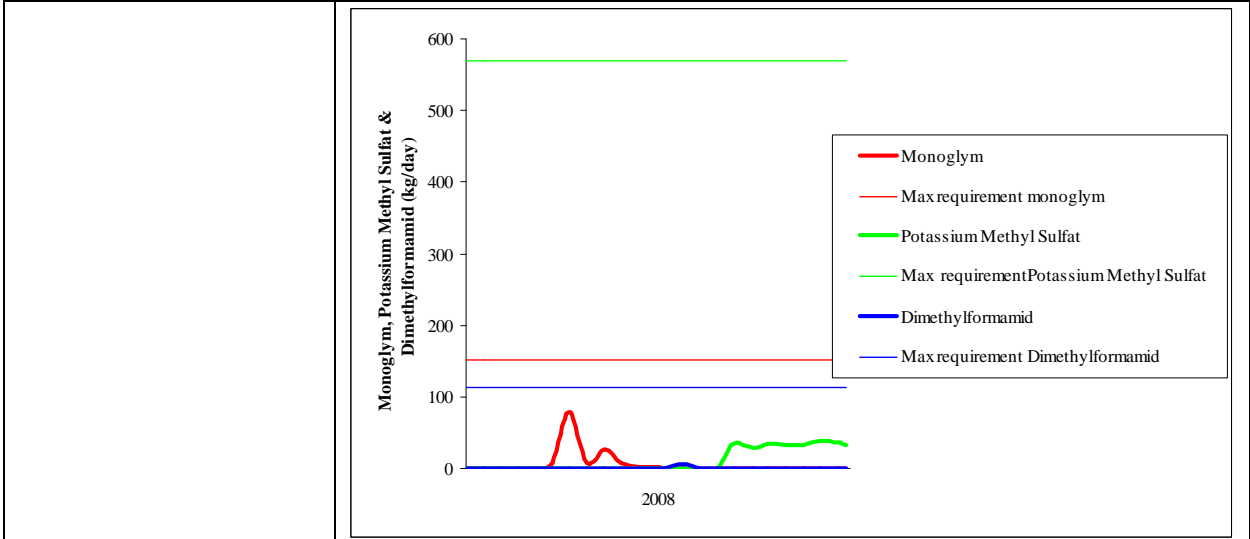
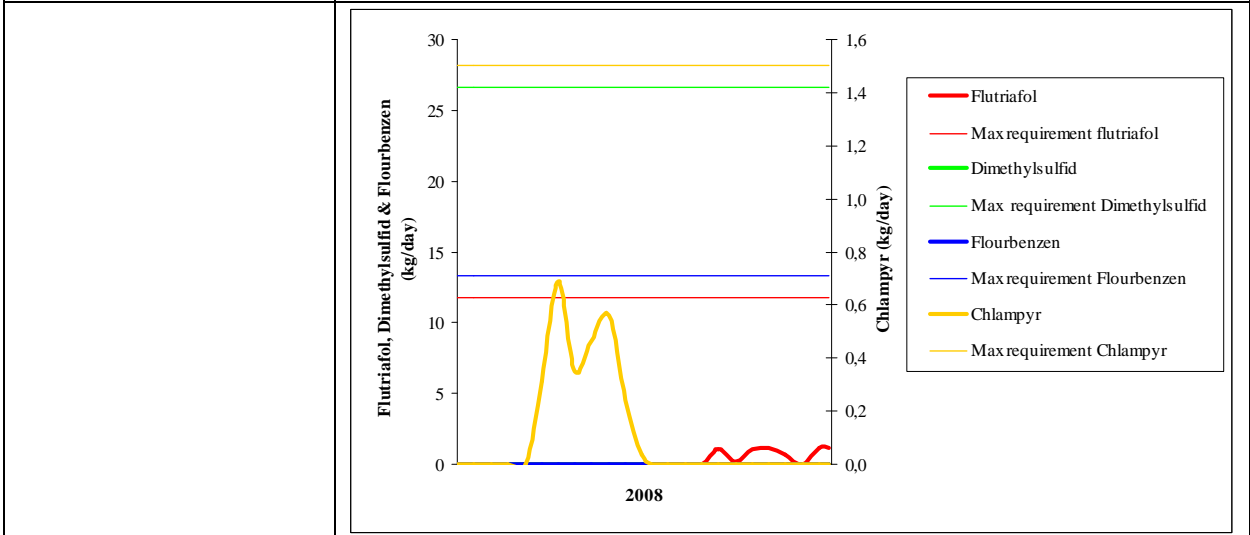
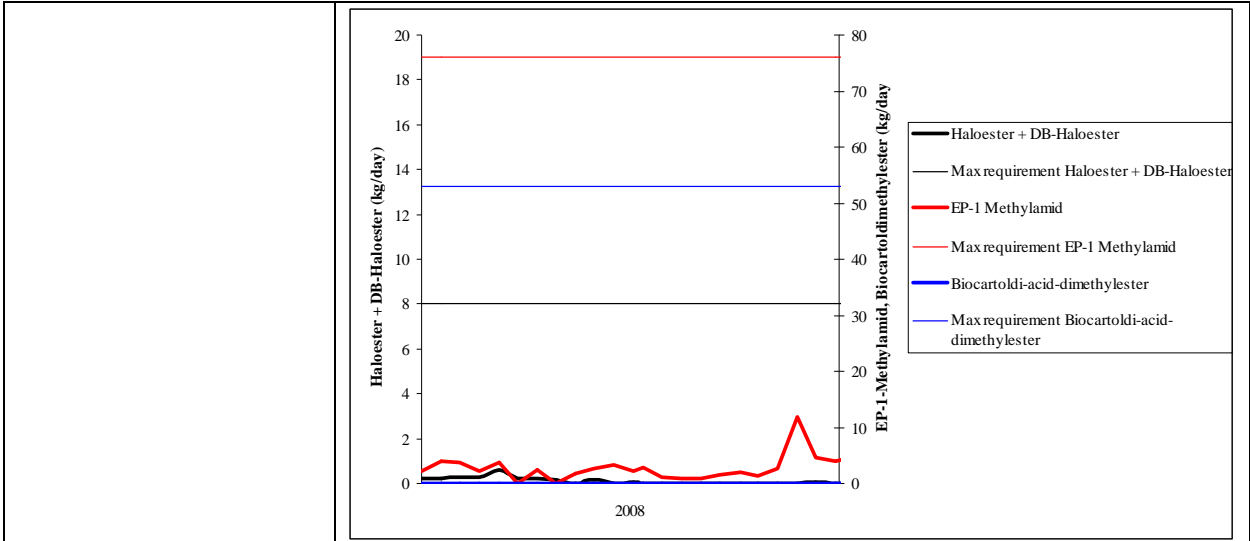
Measurements in 2008 show incidents of non-compliances as the emission requirements of chlorpyrifos, fluazinam, fox and difluorbenzophenon have been exceeded. The environmental permission for the discharge of waste water was revised as per July 1, 2005.

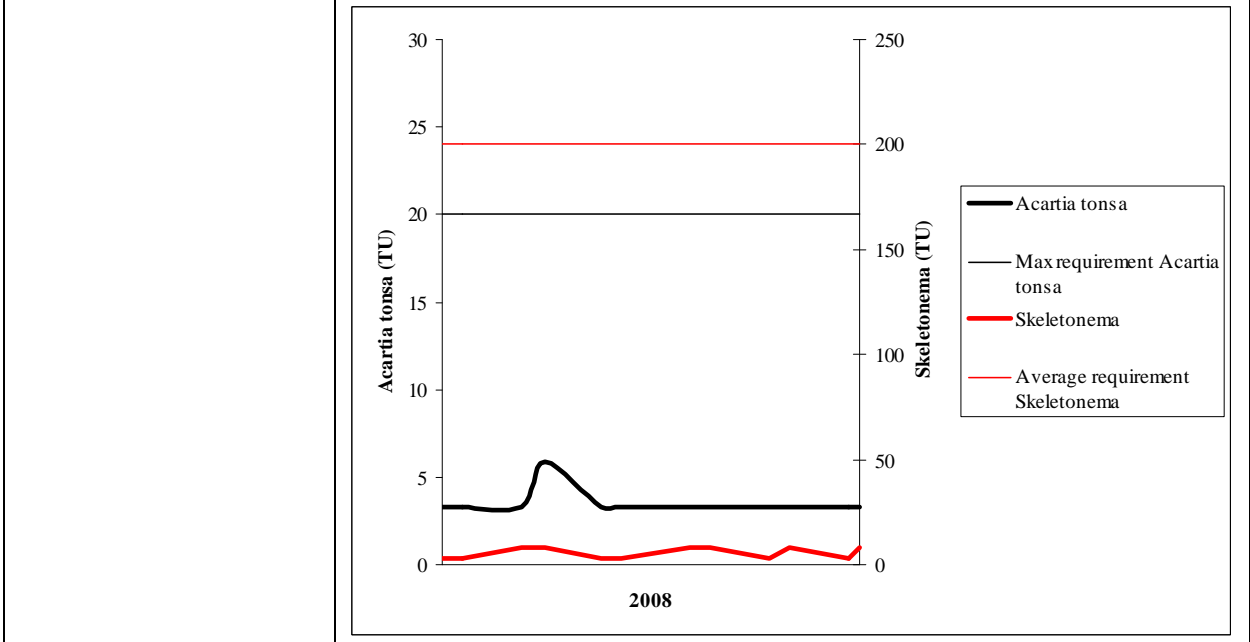
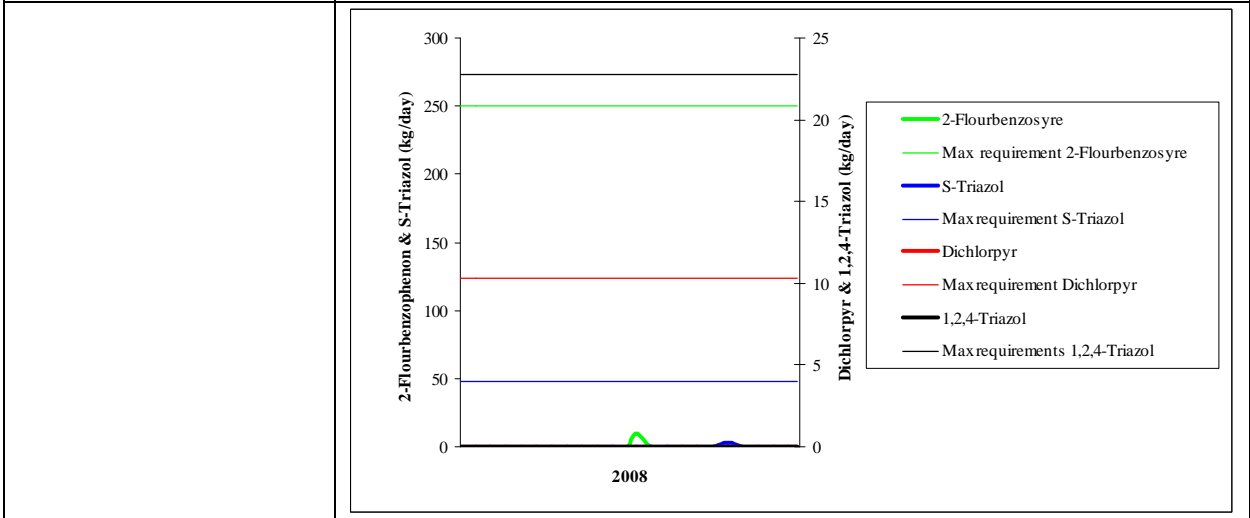
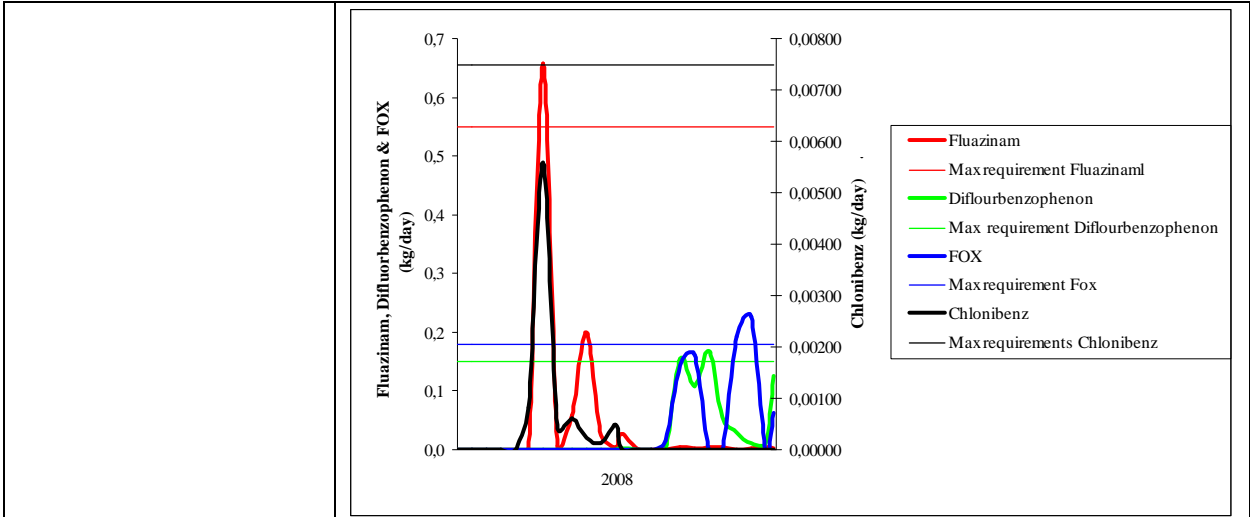
At the revision, EU's Water Framework Directive was incorporated. This has meant that at the evaluation of the impact of the single compounds on the receiver larger safety margins than so far have been put in.

The result is that a number of requirements have been sharpened quite a lot.









## Annex 1

### Objectives, targets and plan of action - Status at the end of 2008 according to the certified management system

<b>Objective:</b> Continuously to evaluate the environmental impact and set up targets for reduction of emissions or consumption of resources, including energy, with regard to the best technology available			
<b>Target/Activity</b>	<b>Schedule</b>	<b>Control criteria</b>	<b>Status</b>
Maintain the energy agreement with the Danish Energy Agency	Currently	Comply with the energy agreement with the Danish Energy Agency	Complied with
Reduce the emission of SO <sub>2</sub> from the Claus plant in proportion to the produced quantity of P-1 with more than 90%	Beginning 2008	Reduction has been demonstrated	Executed
The number of incidents causing pollution on a level of inconvenience is reduced by 10% per year with 2005 as basic year. It is done by improving prevention through implementation of a more thorough and documented analysis of each incident	2006-2009	Procedure has been documented by instructions in the environmental management handbook. Target number has been attained	Target fulfilled for 2008
Consumption of raw materials by the production of dimethoate is improved by 2% compared to 2005	2010	Plant changes have been made and improvement demonstrated	Different potential possibilities of reduction are examined
Consumption of chemicals by the production of GCH is reduced by 1% per year. Measuring parameter is raw material costs in firm prices with 2005 as basic year	2006-2010	Improvement has been demonstrated	Not executed
Campaign for sorting waste with a view to improved sorting	2009	Campaign planned and carried out	Postponed till end 2009
The quantity of hazardous waste from the filling department is reduced by improving the procedures by change of product. The target is a reduction of 10% per year compared to unchanged filling quantity. 2005 is the basic year.	2006-2008	Procedures have been proven in the instructions. Target number has been attained	Executed
Consumption of natural gas has to be reduced by 300 Nm <sup>3</sup> per hour by reusing hydrogen as fuel	End 2008	Controlled through a gas meter	Executed
Improve security against leaking from the old factory site through replacement of borings with drain	End 2009	Drain is established and put into operation	Drain has been established but does not perform as expected. Final status will be made end 2009

<b>Objective:</b> During development of new products and further development of existing products, to choose processes, raw materials and auxiliary substances with regard to their possible impact on humans and the environment.			
<b>Target/Activity</b>	<b>Schedule</b>	<b>Control criteria</b>	<b>Status</b>
Raw materials and auxiliary substances used in connection with new products and formulations are currently evaluated	Currently	Documentation is available	Complied with
Possibilities of minimising the use of hazardous auxiliary substances in the production is examined every second year	Beginning 2009	Result is available	Not executed

<b>Objective:</b> To maintain an open dialogue with collaborators and the authorities concerning the company's policies, targets and results			
<b>Target/Activity</b>	<b>Schedule</b>	<b>Control criteria</b>	<b>Status</b>
Green accounts are prepared every year	Annually in April	The accounts are available	Executed
Facts folder about waste water is prepared	End 2009	Facts folder is available	Postponed till end 2009
Facts folder about air is prepared	End 2009	Facts folder is available	Postponed till end 2009
Facts folder about waste is prepared	End 2009	Facts folder is available	Postponed till end 2009
Facts folder about the subsoil is prepared	End 2009	Facts folder is available	Postponed till end 2009

<b>Objective:</b> To secure that the Responsible Care programme is followed			
<b>Target/Activity</b>	<b>Schedule</b>	<b>Control criteria</b>	<b>Status</b>
Preparation of an annual CSR report*	Annually end May	Report is available	Complied with

\* CSR: Corporate Social Responsibility, i.e. the company's voluntary work with social, ethical and environmental conditions.

## Annex 2

### Key figures for the environmental performance of Cheminova in 2008, Input

Input	Method	Unit	2008	2007	2006	2005	2004
Total energy	M	MWh	503911	485050	544299	563528	581490
• Natural gas	M	MWh	423554	409483	465564	480359	489986
• Electricity consumed	M	MWh	79907	74977	78201	81179	87414
• (Oil, diesel, petrol)	M	MWh	450	590	534	1990	4090
Water							
• Waterworks water	M	1,000 m <sup>3</sup>	792	749	779	842	844
• Cooling water (bay water)	M	mio. m <sup>3</sup>	50	49	51	54	57
Total raw materials	M	Tons	133706	111777	124185	136114	132824
• Unclassified	M	Tons	12059	11250	13791	15113	14213
• Corrosive/causing local irritation	M	Tons	32147	25397	29824	34026	26765
• Hazardous/toxic	M	Tons	54925	44595	49813	53093	53670
• Inflammable	M	Tons	14378	13087	13592	15530	16604
• Harmful to the environment	M	Tons	20197	17448	17165	18352	21572
• Substances on the "List of undesired substances". <sup>1</sup>	M	Tons	4493	3516	3866	3931	3996 <sup>2</sup>
Total auxiliary substances	M	Tons	50040	44381	47922	53623	64929
• Unclassified	M	Tons	2343	1467	1931	2443	1625
• Corrosive/causing local irritation	M	Tons	23028	22940	23851	27785	39075
• Hazardous/toxic	M	Tons	24177	19699	21886	22740	23574
• Inflammable	M	Tons	55	8	30	370	273
• Harmful to the environment	M	Tons	437	267	242	285	382
• Substances on the "List of undesired substances". <sup>2</sup>	M	Tons	562	938	664	521	648
Total packaging	M	Tons	5811	5312	6387	5754	6295
• Metal (drums)	M	Tons	1292	1370	1856	1807	1815
• Plastics (pallet tanks/drums/ containers)	M	Tons	2186	2117	2310	2148	2661
• Cardboard	M	Tons	681	484	522	433	563
• Wood	M	Tons	1652	1341	1699	1366	1256

M: Measured. C: Calculated

<sup>1</sup> Substances listed on the "List of undesired substances" are also included in the categorisation by classification.

<sup>2</sup> The "List of undesired substances" has been revised in 2004.

## Annex 3

### Key figures for the environmental performance of Cheminova in 2008, Output

Output	Method	Unit	2008	2007	2006	2005	2004
Energy							
• Electricity sales	M	MWh	94475	87393	102826	101918	104907
Products							
• Product sales, total	M	Tons	49747	49796	52575	53504	65310
• Unclassified	C	Tons	26	20	48	71	25
• Corrosive/causing local irritation	C	Tons	3355	3934	5910	6300	6334
• Hazardous/toxic	C	Tons	28437	28400	28752	32184	39508
• Harmful to the environment	C	Tons	17982	17442	17865	14949	19443
Waste							
• Waste for recycling, total	M	Tons	3298	2801	2904	3364	3230
• Paper and cardboard	M	Tons	187	169	165	159	128
• Packaging materials	M	Tons	213	136	85	158	96
• Metal	M	Tons	304	323	575	342	419
• Organic waste from canteen	M	Tons	16	13	14	13	13
• Recyclable oil waste	M	Tons	9	4	13	6	13
• Sand-blasting agent <sup>3</sup>	M	Tons			21	25	15
• Recovered raw sulphur	M	Tons	2569	2152	2026	2661	2546
• Cheminova Fosfat (dried sludge)	M	Tons					
• Waste for incineration, total	M	Tons	993	857	976	931	942
• General household waste	M	Tons	67	72	65	63	60
• Industrial waste	M	Tons	87	71	78	83	80
• Active coal	M	Tons	811	691	806	755	766
• Building waste	M	Tons	16	11	14	18	24
• Confidential papers	M	Tons	12	12	13	12	12
• Total depositing	M	Tons	34451	31296	36450	41071	46318
• Building waste	M	Tons	15	25	17	28	28
• Industrial waste	M	Tons	23	16	2	3	15
• Sludge from purification plant (wet)	M	Tons	34413	31255	36431	41040	46275
• Hazardous waste <sup>4</sup>	M	Tons	9136	6127	4970	2661	3286
• Total waste	M	Tons	47878	41081	45300	48027	53776

M: Measured. C: Calculated

<sup>3</sup> From 2007, the sand-blasting agent can no longer be re-used.

<sup>4</sup> Dangerous waste is destroyed by approved facilities.

Output	Method	Unit	2008	2007	2006	2005	2004
Emissions to water							
• Cooling water	M	mio. m <sup>3</sup>	50	49	51	54	57
• Waste water	M	mio. m <sup>3</sup>	1.3	1.3	1.3	1.3	1.3
• Biological oxygen consumption, BI <sub>5</sub>	C	Tons	6	4	5	6	9
• Total organic carbon, TOC	C	Tons	53	44	47	97	109
• Total phosphorus, P	C	Tons	5	4	4	5	5
• Total nitrogen, N	C	Tons	17	22	20	19	22
• Chrome	C	kg	9	15	5	11	8
• Metal H1	C	kg	42	61	41	32	49
• Mercury	C	kg	<0.3	<0.6	<0.6	< 0.9	<0.12
• Arsenic	C	kg	72	66	75	70	
• Cadmium	C	kg	0.2	0.1	2.9	< 0.4	
• Nickel	C	kg	79	67	52	58	10
• Zinc	C	kg	9	33	65	<70	19
• Halogenating organic compounds	C	kg	1434	722	980	1208	2534
• Phenols	C	kg	113	98	93	372	366
Emissions to air <sup>5</sup>							
• Flue gas	C	1000 tons	1571	1399	1628	1607	1506
• Sulphur dioxide, SO <sub>2</sub>	C	Tons	13	36	259	403	341
• Nitrogen oxide, NO <sub>x</sub>	C	Tons	170	102	112	128	132
• Carbon dioxides, CO <sub>2</sub>	C	1000 tons	104	97	110	116	116
• Chrome	C	kg					
• Metal H1	C	kg	0.20	36	0.34	0.30	0.24
• Nickel <sup>6</sup>	C	kg					
• Cadmium <sup>7</sup>	C	kg				0.08	<0.1
• Arsenic	C	kg	0.15	0.7	0.44	1.01	
• Halogenating organic compounds	C	kg	3697	3100	5400	4680	5692
• Chlorine and inorganic chlorine compounds	C	kg	8818	9804	1900	1904	1654
• PM10 (dust)	C	kg	459	11277	589	598	450
Odour							
	C	1000 OU/sec.	121	124	123	191	191
Spillage and waste <sup>8</sup>							
• Emissions to soil	M	No.	17	21	37	46	24
• Other unintended events	M	No.	3	9	6	13	4
	M	No.	14	12	31	33	20

M: Measured. C: Calculated

<sup>5</sup> Emissions to air are inclusive of the emissions caused by the electricity sold.

<sup>6</sup> Chrome and nickel have not been measured since 2003.

<sup>7</sup> Cadmium has not been measured in 2006 and 2007 according to agreement with the authorities.

<sup>8</sup> A systematic registration of spillage and waste has been implemented in 2002.

Cheminova A/S  
P.O. Box 9  
DK-7620 Lemvig

Planning and Business Area  
J. No. AAR-432-00078  
Ref. elgle/antkr  
March 9, 2009

### **Statement concerning Green Accounts 2008 for Cheminova A/S**

The Environmental Centre Aarhus under The Danish Ministry of Environment has received the Green Accounts 2008 for Cheminova A/S.

#### **Statement**

The information in the green accounts corresponds to the supervising authority's impression of the company. We have no information about other important conditions which in our opinion should be included in the green accounts.

#### **Complaints**

It shall be mentioned, however, that to the best of our knowledge the Environmental Centre Aarhus has received no complaints of Cheminova in the accounting year in question.

Yours faithfully

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## **Basis of assessment**

The statement relates to the following information in the green accounts, yet the Environmental Centre has not estimated relations concerning depositing of compounds on soil, disposal of waste and emission of waste water to public sewer as the municipality supervises these conditions:

### *Basic information:*

- The company has been environmentally approved under these list points.
- Information about the company's most essential environmental approvals, including information about the receiver of direct discharge of waste water and about connection approvals to public waste-water plants.
- Date of the latest revision of the company's environmental approval(s).
- The short qualitative description of the most important resource and environmental conditions characterizing the company's main activities and possible secondary activities.

### *Statement by the management:*

- An account of what the company has done throughout the financial year to rectify incidents of non-compliance and to prevent possible repeats.

### *Environmental issues:*

- Information about the company's essential consumption of energy, water and raw materials.
- Information about essential species and quantities of polluting substances which
  - form part of the production processes .
  - are discharged to air, water and soil.
  - form part of the company's products.
  - form part of the company's waste.
- Information about the company's production and handling of waste.
  - the total quantity of waste.
  - division of the quantity of waste into essential fractions.
  - the company's efforts to sort the waste.
- Information about noise, dust and odour conditions
- Information about possible environmental conditions in §7, section 1, that are not relevant to the company.

### *Summary of self-policing:*

Summary of the results of the company's self-policing showing in a survey how the measuring results of the company are compared to the conditions of the approval.