

# ChemClimCircle case presentation: Stockholm, Sweden

*Interreg BSR small project ChemClimCircle #S013 topical seminar with partners, associated organisations and externals. 13th of March 2023.*

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Baltic Sea Region



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The project ChemClimCircle is funded by the INTERREG Baltic Sea Region programme of the European Union.

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# Case presentation ChemClimCircle: Stockholm

## *Purchasing power as a means to reach the goal of a tox-free Stockholm*

13th of March 2023

*Interreg BSR small project ChemClimCircle #S013 topical seminar with partners, associated organisations and externals.*

### **Brief introduction to the project**

ChemClimCircle aims to integrate sustainability criteria on three topics; hazardous chemicals, circular economy and climate impacts, into the purchasing processes at different levels in municipal organisations in order to avoid conflicts which might arise when working on one aspect at the time as well as seeing synergies between the sustainability areas. This is important both on political, organisational, and practical level. The political decisions need to enable the organisation to act in the necessary ways to reach the goals whereas the organisation needs to be set up in a way making the practical work functional to reach the politically set goals. Feedback is needed from bottom to top.

This is the second report from a seminar series on procurement cases from municipalities around the Baltic Sea. The intention to share good examples and practices for sustainable procurement procedures within municipal organisations and is part of the EU Interreg BSR project ChemClimCircle.

### **Summary of the presentation**

*Anne Lagerqvist, Environment and Health (EH) Department, Division for Urban Environment  
Chemical Centre, City of Stockholm.*

### **Political decisions, guidance and action plans**

- Political decisions are a prerequisite for efficient purchasing processes, addressing all parts of the purchasing process and all levels of the organisation. The following documents and action plans mentioned are results of political decisions.
- Stockholm has planning documents with corresponding commitments and goals for integrating environmental issues into purchasing processes: *Program for purchasing* and *Environment program*.
- There are guidance documents and action plans to support the Program for purchasing and the Environment program, which set practical advice on how the goals are to be reached in the organisation. All parts of the municipality have to be active in one way or another, and the action plans also state which part or parts of the municipal organisation that are responsible or need to work with the specific goal.

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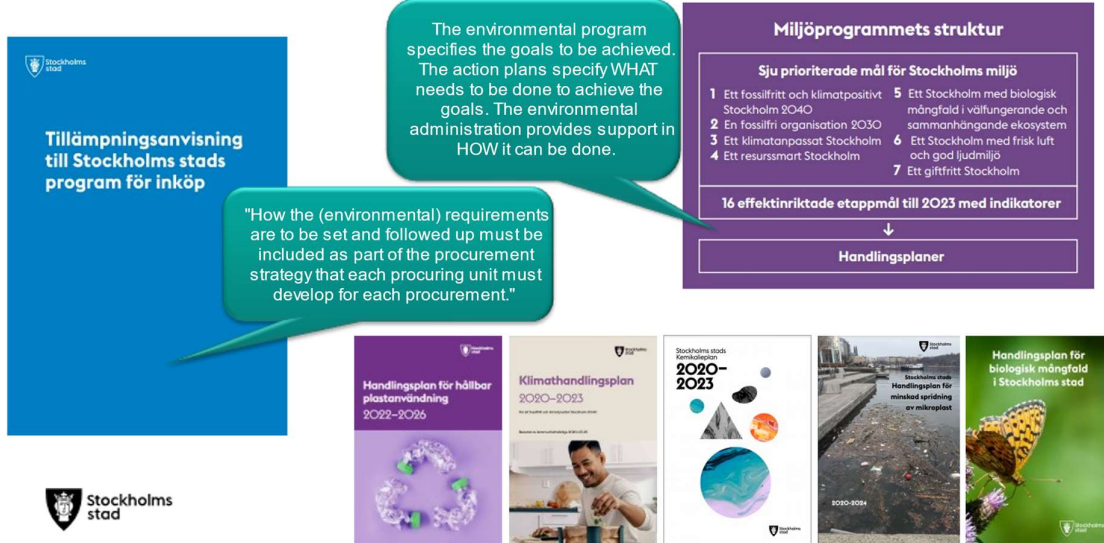


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- There are 7 sustainability goals in the Environment program: (1) fossil free city, (2) fossil free organisation, (3) climate-adapted city; (4) resource smart city; (5) biodiversity; (6) Fresh air and low noise environment; (7) tox free city.
- Stockholm city inhabitants are at around 1 000 000 (one million), there are 12 City districts.
- The Environment and Health department works together with and provides support for the Service Department (which performs many of the City's procurements), 12 city districts (including preschools), other departments and the City's own companies.



Since there are a lot of documents and Action plans it might be a challenge for the City districts and Departments to know what they in specific should focus on doing in order to reach the goals. This is one part where the Chemical centre and other parts of the Environment and Health Department provides support.

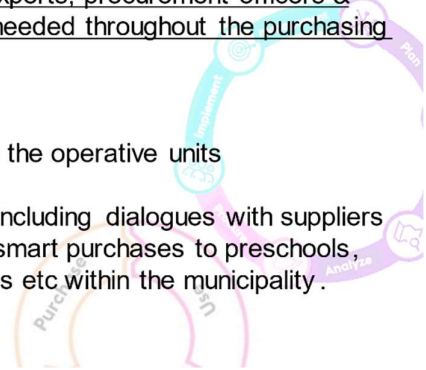
### Chemical action plan

The chemical action plan states that there is need of contact between experts, procurement officers and contract controllers throughout the purchasing process (see the picture below). This includes market dialogues as well as analysis of needs in the operative units by contact with persons who are going to use the articles and products we procure. While the assortment needs to be set for the users of the articles and products, criteria are needed in tenders together with setting the assortment, to ensure that the city's goals are fulfilled and the assortment is as non-toxic as possible, for example. It is almost impossible to achieve completely non-toxic assortments. For



Contact between the experts, procurement officers & contract controllers is needed throughout the purchasing processes:

- Market dialogue
- Analyses of needs in the operative units
- Criteria in tenders
- Follow up of criteria including dialogues with suppliers
- Advice on chemical smart purchases to preschools, schools, care facilities etc within the municipality.



example, in the healthcare there might be PVC plastics in some of the the utensils used. Due to this, advice to the staff ordering from the procured assortments need to be presented, in order to make it easy to make the best choices possible.

There are a lot of procurements done in the city each year, efforts need to be directed where there is a high potential to make a difference. Thus, the Chemical action plan has prioritised areas which are deemed to yield a large impact on reduction of hazardous chemicals, presented in the picture below.

Procurement staff need to tick a box in the procurement system when they include criteria for hazardous substances in the tender.

**Prioritized contract areas for chemical criteria according to the Chemical Action Plan:**

<u>Consumables:</u>	<u>Other areas:</u>
Creative materials	Graffiti removal and cleanup
Hygiene and home related articles	Toys and sportsutensils
Chemical products and cleaning utensils	Food contact materials
Office and school supplies	Furniture, textiles and light sources
Kitchen and household items	Cleaning services
Paper and plastic consumables	Medical technical equipment
Health care and incontinence articles	Printing services
	Laundry and textile services
<u>IT- equipment:</u>	Vehicles
AV articles	Work wear and shoes
Computers and network	
Printers and document production	
IT supplies	

There is a new type of follow-up for sustainability criteria in the procurements of the city from 2022. There are boxes to tick in the procurement system which the procurement staff need to do before they advertise the tender. An example is the goal of a non-toxic Stockholm, when the experts from the Chemical Centre has participated and criteria were applied, the procurement officer can then tick that particular box. This gives us the means to follow up which procurements that have different sustainability criteria.

## Strategy for Sustainable use of plastics

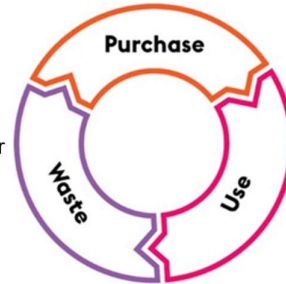
Stockholm has a strategy for sustainable use of plastics which is a part of the Action with the same name. The ChemClimCircle aspects are integrated here:

There is a synergy in the types of plastic which are better in a chemical viewpoint since they are also the types which are more readily recycled in the current systems, giving a potential for circularity. These plastic types are PET, polyethylene and polypropylene. Other plastic types which have risks of containing hazardous substances should not be recycled until there is a system to assess which materials that are fit for recycling without chemical hazards.

## Strategy for sustainable use of plastics

Sustainable use of plastics integrating the ChemClimCircle aspects:

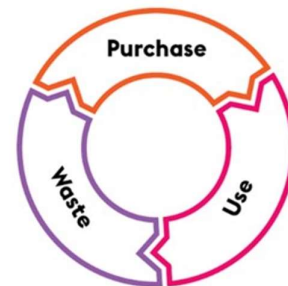
- Types of plastic which are better in a chemical viewpoint are also better circular choices since they are the most commonly recycled in the current systems:
  - Polyethylene (PE)
  - Polypropylene (PP)
  - Polyethylenetersphthalate (PET)
- Recycled plastics in articles and packaging material gives a climate positive effect since new fossile raw matrerials are not used and incinerated as waste.
- Alternative materials: Sustainable forestry (or other bio-sources) and functional recycling of paper products is needed when switching from fossile sources of materials to renewables.



Alternative materials to plastic, for example renewable resources such as wood fibre has to be well controlled not to cause deforestation. Forest raw material can not solve all the need for resources, since this will probably mean use of too much forest resource annually, reduction and reusable items are two ways to reduce the demand for resources.

The basic questions are these: can we replace single use products with reusable alternatives, request materials other than plastics, request products with recycled plastics. The latter is a good alternative, to use what we already produced over and over. Compostable plastic need to be avoided since the necessary industrial compost facility to take care of that type of plastic is not available in Sweden. The plastic strategy is thus:

- *Investigate the need for plastics before each procurement*
- *Replace or complement single-use products with reusable alternatives*
- *Request products made with materials other than plastics*
- *Request products made with recycled plastics*
- *Request products made with bio-based plastics*
- *Set requirements to ensure that the plastic that is purchased does not contain harmful substances*
- *Set requirements to ensure that the plastic that is purchased is recyclable*
- *Avoid compostable plastic*



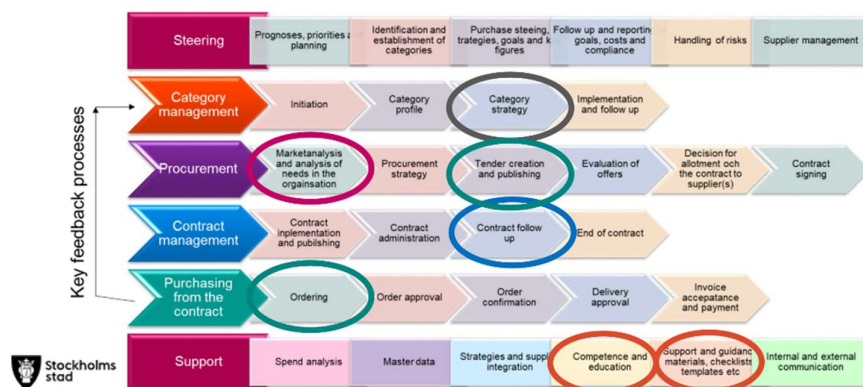


## The Environment and Health Department offers support

One of the tasks of the Environment and Health department is to give support to the City districts, departments and companies within the municipality's organisation. In the picture below (unofficial translation), process parts in which the experts from the Environment and Health Department should prioritize to participate are circled. Cooperation with City districts are important in the purchasing process, they have care homes, preschools and other facilities which use a lot of consumables and other materials, and information on the best choices in the procured assortment should be made available for them.

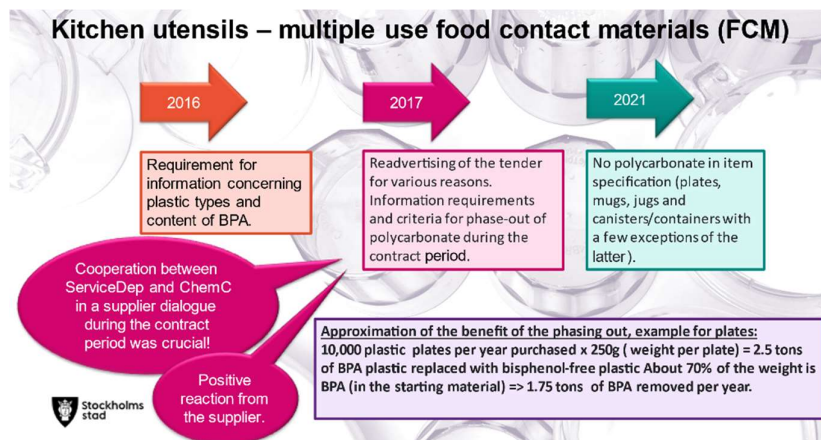
The dialogue with the different parts of the city need to be continuous and go both ways in order for both the experts to know what is possible in the operative units who use the procured articles and products, and for the employees in these units to understand why it is important to work for sustainability goal reach within the purchasing processes.

### Identify where the largest need of cooperation exist in the purchasing processes



## Practical examples

Kitchen utensils: Schematic illustration of the procedure to phase out the hormonal disruptor bisphenol A from multiple use FCM materials, and assure that it is not replaced by other bisphenols, is presented below.



Single use food contact materials (FCM): There is a legislation on single use plastic FCM material in force since 2021, but already before that Stockholm started to phase out those types of articles by choices in the article specification for that particular procurement as well as criteria in the tender, as summarized in the picture below.

## Singel use food contact materials (FCM)

- Started with criteria in procurement 2019 (Chemical centre and Climate specialists):
  - Cups made of bioplastic or paper.
  - Cutlery made of wood.
  - Food boxes from “bagasse” (paper -ish type of material).
- Cooperation between Service Department and the Chemical centre necessary to keep the range free of fossil plastics. Some exceptions still exist.
- Partly according to the new directive for single-use plastics (2021).
- **About 2 million cups, close to 1 million pieces of cutlery, 250 000 single use food containers = at least 14 tonnes of plastic annually.**
- The disposable plates were already made of paper.



Increase the use of recycled plastic materials where possible: Waste bags can preferably be made from recycled plastics. There is a good supply and many of the waste bags can be made from 100% recycled plastics without challenging the function. Sometimes a small amount of virgin material need to be added into the recycled plastic material to ensure strenght, depending on the quality of the recycled raw material. To demand 80% recycled raw material is therefore feasible. The picture below summarizes the work done in Stockholm on this topic.

## Criteria concerning wastebags made from recycled plastic

- Use of the plastic one more time before incineration: 200-300 tons of waste bags per year are purchased in the city according to statistics from the e-commerce system. (ChemC and Climate)
- **Reduction of extraction of new fossil raw materials = 200-300 tons of plastic which does not need to be produced from virgin materials.**



### Dialogues with suppliers:

- Partially recycled raw material in packaging for chemical products.
- Partially recycled raw material in shoe covers (and reduced use).
- Follow-up on secondary packaging materials.
- The Swedish procurement authority's new (2021-22) requirements for packaging are starting to be used (RFI).





Office supplies: About one million, equalling 25 tons, of erasers annually is purchased by the Education Department annually to supply the schools. Now they're free from PVC plastic. To achieve this, work with the article specification as well as requirements for a PVC-free assortment in the office supplies was needed in the procurement process. After signing of the contract, follow-up together with the Service Department's contract manager for this contract was performed. There was still erasers with PVC in the assortment which the supplier offered to the city, by mistake. These were removed after the follow-up of the contract and only PVC-free erasers are present in the assortment available to the city's operations now. This illustrates the importance of follow up of contracts and dialogues with suppliers during the contract period and is summarized in the picture below. The example is from a previous Interreg BSR project (NonHazCity 1).

## Office supplies – 25 tonnes of erasers annually (Education Department)

- The Chemical center participated by:
  - Working with the article specification and set requirement for a PVC-free assortment, avoiding plasticizers.
  - Working with the follow-up together with the service department's contract manager.
- The Education department buys approx. 1,000,000 erasers per year and now they are PVC-free (after follow-up).
- The PVC erasers weigh 25g each = phase-out of 25 tonnes of PVC per year.



Sport utensils for the Education Department (Stockholm's schools): 42 articles were chosen for analysis of chemical content, both according to legislated levels of chemicals and criteria in this particular contract. Most articles were ok, but eight articles with hazardous content were identified not complying with the EU legislative standards or the set criteria, shown as the orange colored flashes in the picture below. All the items which did not fulfil the legislated requirements are taken out of the supplier's assortment and the ones which did not fulfil Stockholm's procurement criteria are not available in our web shop. Some examples of material in which no deviations were found are also present in the picture, with green flashes, but not all are shown here.

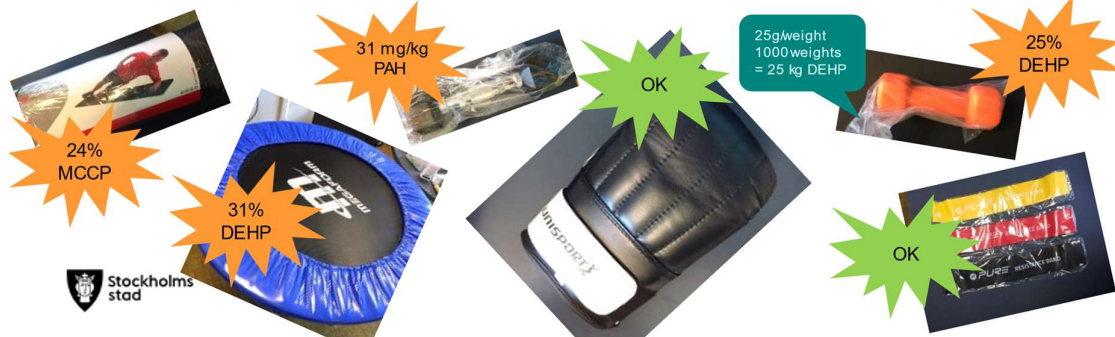
An example of materials which fulfilled both the legislative requirements and procurement criteria are the samples of cover and foam for mattresses, these all passed with good results, these are produced in a Finnish factory where the contracted company have close contact concerning the materials used. This illustrates that close contact with the factory makes it easier to gain information on conformity with legislation and the set procurement criteria.

## Sports utensils



Education department contract: 42 articles were chosen for analysis both according to law and criteria in the tender (ChemC), **8 with hazardous content**.

- Gym equipment: weights, mitts, balls, mats, skipping ropes and other rubber bands.
- Larger items: samples of cover and foam from mattresses. **OK**
- One tent, a trampoline, volleyball field liner, balance ball, snow mattress, "whizzball", water bottle.



DEHP is a reproductive toxicant which can be found in PVC-plastic, this substance is forbidden in most materials within the EU. It was found in two of the tested items, which are illegal to sell. As an example, an approximation is made to illustrate that if buying 1000 of the article which contained 25% of this substance in the plastic cover which might be 100g of the article, the municipality actually unknowingly buys 25kg of hazardous substance into the schools where children use these, and illustrates the necessity of follow up of contracts.

Other substances found are chlorinated paraffins (here MCCP, but SCCP were also found) and polycyclic aromatic hydrocarbons (PAH) for which the legislated concentration limit is much lower than for the phthalates such as DEHP. SCCP are regulated in law whereas criteria for MCCP content were set in the tender, although MCCP are on the candidate list in the European chemical legislation REACH.

Phase out of highly fluorinated substances in fire extinguishers: There are approximately 15,000 PFAS containing foam fire extinguishers in the Stockholm City districts and the schools of the municipality. These fire extinguishers have 6 or 9 liters of content, which is mostly water. An approximation that this roughly equals kilos was made to the calculation in the picture below. There is approximately 3% of PFAS in the fluid in the extinguisher, as an average. The data concerning this are from a report from the chemicals authority in Sweden that the content of PFAS is between 1% and 6%. In total, that gives us 3.4 tons of PFAS which is sitting in our preschools, schools, elderly care facilities and other other facilities. The ideal situation is that the fire extinguishers don't need to be used, hopefully there are no fires and when the extinguishers are replaced in the regular cycle of five years no new PFAS will be present. During the current contract extinguishers containing PFAS were phased out from the city's assortment, meaning that no new PFAS will be present. There are new innovative extinguishers, one with only water, but it has a different nozzle, giving it the fire extinguishing capacity needed for most of the locations in the city, it will efficiently put out any fire which can occur in a preschool or elderly care facility. The foam extinguishers with PFAS is mostly for extinguishing fires in gasoline or other flammable chemicals, it is very rare for that capacity to be needed in the municipality.

## Highly fluorinated substances (PFAS) i fire extinguishers

- PFAS are long-lived and difficult-to-degrade substances that the city must phase out according to the Chemicals Action Plan.
- Requirements in the procurement (2019), phasing out during the contract period when possible, which started to happen 2021-22!
- The city has an estimated at least 15 000 foam fire extinguishers.
- 15 000 x 7.5 kg with 3% of PFAS substances = 3.4 tons of PFAS.
  - Two sizes, 6 or 9 litres (mostly water so translated to kg).
  - Content of PFAS between 1-6%.
- A ban on the entire group of PFAS in EU has been proposed in 2023.

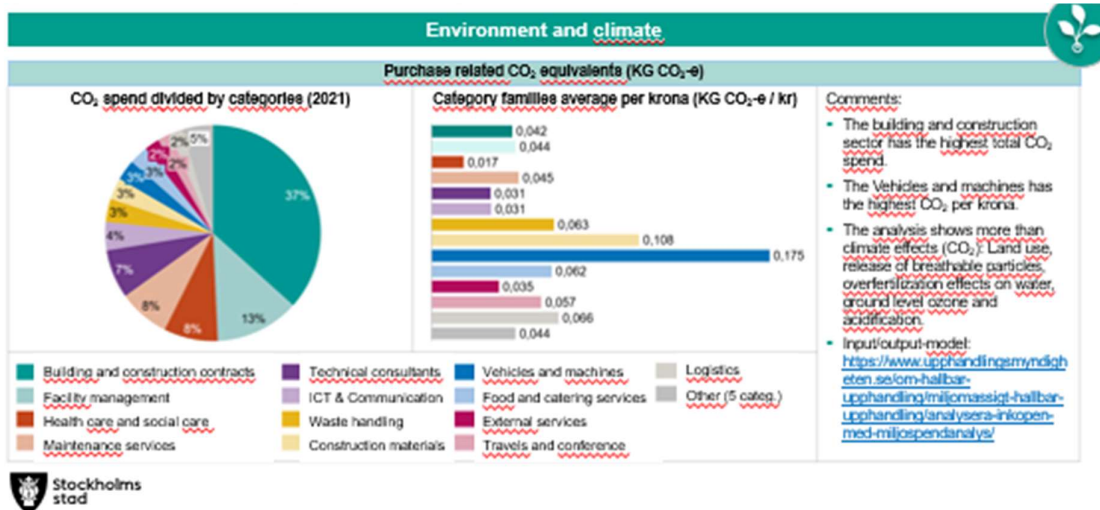


<https://www.kemi.se/publikationer/pm/2014/pm-3-14-kartlaggning-av-brandslackningskum>

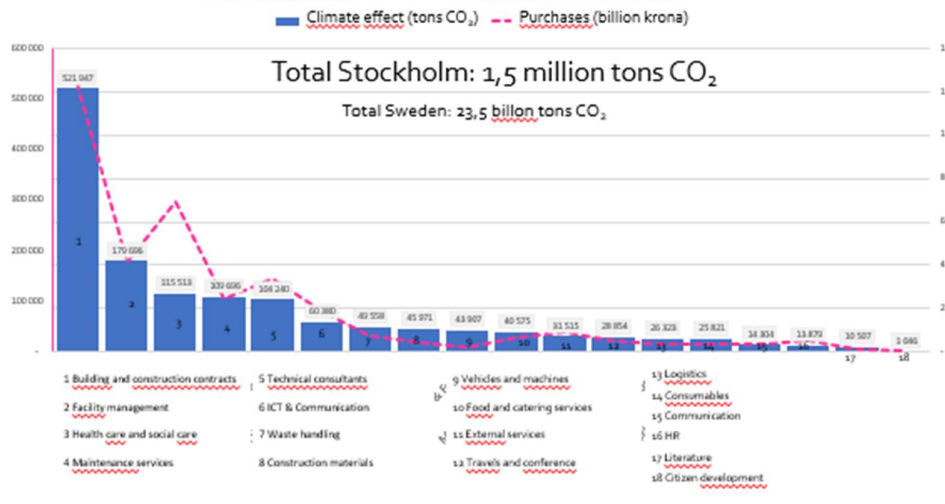
## Climate effects(CO<sub>2</sub>) from the city's purchasing activities

By use of the Swedish National Agency for Public Procurement's input/output-model, the purchase related CO<sub>2</sub> equivalents were calculated and assessed for different categories of purchase: <https://www.upphandlingsmyndigheten.se/om-hallbar-upphandling/miljomassigt-hallbar-upphandling/analysera-inkopen-med-miljospendanalys/>

In the picture below, both the CO<sub>2</sub> spend in total per category (circle graph), as well as the CO<sub>2</sub> released per Swedish krona (bars), is shown. In the second picture, the CO<sub>2</sub> is plotted together with the spend to illustrate the difference between categories.



### Climate effects from the respective categories



### Reports from the procurement system

Inclusion of sustainability criteria according to the goals set in the environment program: In order to follow up on the use of sustainability criteria in the city's procurements, each procurement officer needs to choose which goals from the environment program that criteria in the particular procurement contributes to. Of the 576 procurements from 2022, more than half included one of these environmental aspects. It is also possible to extract statistics on all the goals separately in order to see which sustainability areas that are most commonly included in the procurements. This system gives a means to follow up on large scale, but in order to know what effect the sustainability criteria has, a more in depth analysis is needed where results from follow up on the contracts which included such criteria are analysed and summarized.

### Sustainability criteria in procurement in Stockholm – statistics from the procurement database (internal)

- Number of procurements 2022: 576
- Part of these 576 where criteria for social benefits were used: 78%
- Part of these 576 where environmental criteria were used: 56%
- This includes many aspects and it is possible to divide it on goal areas from the environment program



	Summa genomförda anskaffningar	Andel sociala krav upphandling	Andel sociala krav upphandling	Andel upphandlingar där miljökrav upphandling	Andel miljökrav i genomsnitt per upphandling
Förvaltningsbolag					
Exploateringskontoret	59	66%	42%	0.9	
Beneckningsenheten	52	73%	48%	1.1	
Idrottsförvaltningen	43	42%	30%	0.4	
Fästighetskontoret	42	93%	88%	2.0	
Alla övriga i Stockholm	39	50%	67%	1.4	
Stockholm Vatten AB	38	76%	68%	0.9	
Trafikkontoret	36	92%	56%	1.1	
Arbetsmarknadsförvaltningen	25	92%	88%	1.0	
Kulturförvaltningen	21	57%	19%	0.2	
Skullstigheter i Stockholm Aktieförvaltning (SISAB)	21	95%	71%	1.0	
Stockholms Stads Parkerings Aktieförvaltning	17	94%	65%	0.9	
AB Familjebostäder	15	73%	53%	0.6	
Micasa Fästigheter i Stockholm AB	15	100%	67%	1.5	

The Environment and Health Department has around 10 experts working partially with procurement issues within the following areas:

- Chemicals (Chemical Centre)
- Climate, energy and circularity (Centre for Circularity, Energy and Climate unit)
- Biological diversity and ecosystem management (Division for Urban Environment)
- Vehicles and transportation (Transportation Centre)



## Discussion

### *Discussion with all participants on themes presented*

**Question.** Polycarbonate plastic – what exactly is the problem?

**Answer.** Bisphenol A, which is the main constituent of polycarbonate plastic, is on the candidate list in REACH because of its reproductive toxicity. Very low doses of this chemical can change endocrine system function, which has been shown both in animals and epidemiological studies on humans. Endocrine disruptive substances have effect at very low levels.

**Question.** How do you ensure that there is no exposure to toxic substances from plastic materials within the recycling process?

**Answer.** One example is PVC plastic, for example PVC flooring and toys. Up to 70% of the material can be plasticizers, such as the phthalate DEHP which was mentioned in the presentation. A more common content is around 30% of plasticizer and the phthalate plasticizers are classified as toxic to reproduction. These substances does not stay in the material but leaks during use and waste phases, to avoid circulation of hazardous substances these PVC materials need to be burned. The material can only be recycled if there is chemical recycling, properly separating the polymer from the plasticiser. That type of recycling is not readily available in the current systems, only on test basis.

There is a functional recycling system for food grade PET bottles in Sweden. Since this is FCM grade plastic it is more controlled than non-FCM plastic and should be kept in this loop. It will be a down grading to use FCM grade PET material to make non-FCM material such as textiles.

Polypropylene and polyethylene, can be recycled into different items, as the example of waste bags in the presentation above, or packaging for chemical products like bottles for detergents, where it doesn't need to be food contact standard. There is need for an analysis to find the places where recycled plastic of different types fits best. If it is an uncontrolled source or if it is FCM grade, the plastic should have different fates.

**Question.** Are you aware of the new research on dermal contact exposure to endocrine disruptors, is it more important than the oral contact?

**Answer.** It is very different from compound to compound, which substance will actually be able to get through all the skin layers and into the bloodstream, it depends on molecular size and solubility properties. Sometimes textiles are treated with antimicrobial agents, when having that type of textile close to the skin, there will of course be transfer, the question is how much will leak from the textile and how much will then be absorbed through the skin. These textiles are probably not put in the mouth so for these the dermal contact might be a larger source than oral exposure, while for other materials and substances the oral exposure is higher and more relevant. I do not know all the details on this, it is on research level in that field, and there is not one answer, it depends from case to case.

**Question.** How you have calculated your CO<sub>2</sub> emissions of the procurements.

**Answer.** It is a colleague at the City executive office who have done these calculations using the Swedish National Agency for Public Procurement's system, we will have to invite her to one of these meetings in order to get to know more details.

**Question.** How do you show the impact to the public – a kind of monitoring system (the “environment barometer”)?



*Answer.* Not all of the cases of reduction of hazardous substances which were presented here are present on the “environmental barometer” webpage: <http://miljobarometern.stockholm.se/miljomal/>. It has information on the Environment programme, all the Action plans etc, but the actual data which are there are mostly measurements of substances in the outer environment with timelines of both different organic chemicals and heavy metals in the water bodies of Stockholm, and data from the waste water treatment plants. There is need to develop a way to present the results from the measurements of indoor environment (dust and air) as well as the results from analyses of hazardous substances in articles and materials.

**Question.** How do you run regular meetings (for education and information) with your internal staff, with politicians, with procurers?

*Answer.* We have met the contract controllers and explained some of the cases where we see that it has been very important that we have collaborated with the follow up of contracts, in order to make change and assure that the assortment is in conformity with legislation and our specific criteria set in the tender. We will also take part in a meeting with the procurement staff in June this year, to give information on the sustainability goals of the city, and how we need to work together with the sustainability criteria, in their processes, in order to fulfil the goals. We have been doing that before, but since there is a turnover of staff it needs to be repeated every now and then. Here it is useful to be able to show the actual reductions in presence of hazardous substances resulting from the set criteria and subsequent follow up measures.

We also have an internal network of the specialists at the Environment and Health Department, supporting in the procurement processes, which is coordinated by the Centre for Circularity. Here we discuss different issues and good examples in relation to the purchasing processes of the city, the ways of collaboration and other things related to the topic.

The contact with politicians is done on a higher level, our Head of Department or heads of the different units.

**Question.** You mentioned plastics a lot, single use FCM and such. How is this managed and how do you take the chemical issue of plastics into account?

*Answer.* In some ways, plastics is a bit more of a climate issue. I have colleagues who are working with that part, but the plastics also have a chemical impact. Therefore, we have been dealing with this question in dialogue and then in dialogue with the procurement staff. There is a part in the climate action plan to lower the CO<sub>2</sub> footprint from plastic materials in municipal use. In Sweden, there is a system for burning garbage in the municipalities and there is a goal set to reduce the amount of fossil plastic that ends up in the power plants that burn the garbage to make central heating for the municipality. In my opinion, if we recycle the plastic one more round, as with the waste bags presented earlier, that could reduce the climate footprint by half, but this is not yet taken into consideration in the calculations of climate effect reduction. Concerning the single use FCM, we knew that the directive for those types of materials was coming into force but we wanted to act bit ahead of time, to have our suppliers actually fulfilling the law by the time it went into force. Another aspect was for the city’s operations to have time to get used to the new types of materials. Due to this, criteria were used already 2019 together with follow up and check of the assortments being presented in the e-commerce system.

**This discussion was followed by an internal discussion on project matters that is not reported here but used for further development in the project.**

**End of meeting.**